IonQ iQuHack2025 Challenge

Before proceeding, register once. Then, comment out the registration function call to avoid re-registering when running the notebook again.

```python
In [1]: import requests

def register():
    team_name = input("Enter your team name: ")
    in_person = input("Enter participation type - in-person or remote: ")
    data = []

    while email := input("Enter email separated by commas (enter to cancel): "):
        firstname = input("Enter your first name: ")
        lastname = input("Enter your last name: ")
        github = input("Enter your github handle: ")
        data.append((firstname, lastname, email, github))

    for firstname, lastname, email, github in data:
        url = f"https://ionquhack2025.azurewebsites.net/api/registration?TeamName={
        req = requests.post(url)
        print("\n\n\n"+req.text)


# Comment this out after registration:
# register()
```

Enter the `key` you've got on the previous step here:

```python
In [2]: key = ""
```

Did you comment out the `register()` function call?

Please share your research process on GitHub: https://github.com/iQuHACK/2025-IonQ/discussions

Maximum Cut problem (max-cut) with variational Quantum Imaginary Time Evolution (varQITE) method

In this challenge, we demonstrate how to leverage IonQ Forte's industry-leading capabilities to solve instances of the NP-hard combinatorial optimization problem known as Maximum Cut (MaxCut) using a novel variational Quantum Imaginary Time Evolution (varQITE) algorithm developed by IonQ in conjunction with researchers at Oak Ridge National Labs (ORNL).

What's the problem?

MaxCut 101

The Maximum Cut Problem (MaxCut) is a classic combinatorial optimization problem commonly used as an algorithm benchmark by scientific computing researchers. It has numerous applications in a variety of fields: for example, it is used in circuit desing as part of Very Large Scale Integration (VLSI) to find the optimal layout of circuit components; it is used in the study of social networks to identify communities; it is used in computer vision for image segmentation, etc.

MaxCut is a graph problem: given a graph $G = (V, E)$ with vertex set V and edge set E, it asks for a partition of V into sets S and T maximizing the number of edges crossing between S and T.

Think of it like this: you're trying to cut the graph into two pieces, and you want to make the cut so that it slices through as many edges as possible.

Prepare the code environment

First, we'll set up the coding environment and install necessary dependencies.

```
In [2]:   pip install qiskit qiskit-aer networkx numpy pandas -q
```

Note: you may need to restart the kernel to use updated packages.

To ensure your code runs correctly everywhere, please only use the imported dependencies. Using external libraries may cause your submission to fail due to missing dependencies on our servers.

```
In [3]:   ## IonQ, Inc., Copyright (c) 2025,
          # All rights reserved.
          # Use in source and binary forms of this software, without modification,
          # is permitted solely for the purpose of activities associated with the IonQ
```

```python
# Hackathon at iQuHack2025 hosted by MIT and only during the Feb 1-2, 2025
# duration of such event.

import matplotlib.pyplot as plt
from IPython import display

import networkx as nx
import numpy as np
import pandas as pd
import time

from typing import List
from qiskit import QuantumCircuit, transpile
from qiskit.circuit import ParameterVector
from qiskit.quantum_info import SparsePauliOp
from qiskit_aer import AerSimulator
```

Graph definition

A simple graph, defined using the Python NetworkX library, will serve to illustrate the problem and you can explore further complexities.

In [4]:
```python
# other graphs candidates to check

import networkx as nx
import matplotlib.pyplot as plt
import random

#-> Cycle Graph C8
def cycle_graph_c8():
    G = nx.cycle_graph(8)
    plt.figure(figsize=(6, 6))
    pos = nx.circular_layout(G)
    nx.draw(G, pos, with_labels=True, node_color='lightblue', edge_color='gray', no
    plt.title("Cycle Graph C8")
    plt.show()
    return G

# Path Graph P16
def path_graph_p16():
    G = nx.path_graph(16)
    plt.figure(figsize=(12, 2))
    pos = nx.spring_layout(G, seed=42)
    nx.draw(G, pos, with_labels=True, node_color='lightgreen', edge_color='gray', n
    plt.title("Path Graph P16")
    plt.show()
    return G

#-> Complete Bipartite Graph K8,8
def complete_bipartite_graph_k88():
    G = nx.complete_bipartite_graph(8, 8)
    plt.figure(figsize=(8, 6))
    pos = nx.bipartite_layout(G, nodes=range(8))
```

```python
    nx.draw(G, pos, with_labels=True, node_color=['lightcoral'] * 8 + ['lightblue']
            edge_color='gray', node_size=300)
    plt.title("Complete Bipartite Graph K8,8")
    plt.show()
    return G

#-> Complete Bipartite Graph K8,8
def complete_bipartite_graph_k_nn(n):
    G = nx.complete_bipartite_graph(n, n)
    plt.figure(figsize=(8, 6))
    pos = nx.bipartite_layout(G, nodes=range(n))
    nx.draw(G, pos, with_labels=True, node_color=['lightcoral'] * n + ['lightblue']
            edge_color='gray', node_size=300)
    plt.title("Complete Bipartite Graph K{},{}".format(n,n))
    plt.show()
    return G

# Star Graph S16
def star_graph_s16():
    G = nx.star_graph(16)
    plt.figure(figsize=(8, 8))
    pos = nx.spring_layout(G, seed=42)
    nx.draw(G, pos, with_labels=True, node_color='gold', edge_color='gray', node_si
    plt.title("Star Graph S16")
    plt.show()
    return G

# Grid Graph 8x4
def grid_graph_8x4():
    G = nx.grid_graph(dim=[8, 4])
    plt.figure(figsize=(12, 6))
    pos = {node: node for node in G.nodes()}
    nx.draw(G, pos, with_labels=True, node_color='lightblue', edge_color='gray', no
    plt.title("Grid Graph 8x4")
    plt.show()
    return G

# Grid Graph 8x4
def grid_graph_nxm(n,m):
    G = nx.grid_graph(dim=[n, m])
    plt.figure(figsize=(12, 6))
    pos = {node: node for node in G.nodes()}
    nx.draw(G, pos, with_labels=True, node_color='lightblue', edge_color='gray', no
    plt.title("Grid Graph {}x{}".format(n,m))
    plt.show()
    return G


#-> 4-Regular Graph with 8 Vertices
def regular_graph_4_8():
    G = nx.random_regular_graph(d=4, n=8, seed=42)
    plt.figure(figsize=(6, 6))
    pos = nx.circular_layout(G)
    nx.draw(G, pos, with_labels=True, node_color='lightgreen', edge_color='gray', n
    plt.title("4-Regular Graph with 8 Vertices")
    plt.show()
```

```python
        return G

#-> Cubic (3-Regular) Graph with 16 Vertices
def cubic_graph_3_16():
    G = nx.random_regular_graph(d=3, n=16, seed=42)
    plt.figure(figsize=(8, 6))
    pos = nx.spring_layout(G, seed=42)
    nx.draw(G, pos, with_labels=True, node_color='lightcoral', edge_color='gray', n
    plt.title("Cubic (3-Regular) Graph with 16 Vertices")
    plt.show()
    return G

# Disjoint Union of Four C4 Cycles
def disjoint_union_c4():
    cycles = [nx.cycle_graph(4) for _ in range(4)]
    G = nx.disjoint_union_all(cycles)
    plt.figure(figsize=(12, 6))
    pos = {}
    shift_x = 0
    for component in nx.connected_components(G):
        subgraph = G.subgraph(component)
        pos_sub = nx.circular_layout(subgraph, scale=1, center=(shift_x, 0))
        pos.update(pos_sub)
        shift_x += 3
    nx.draw(G, pos, with_labels=True, node_color='lightblue', edge_color='gray', no
    plt.title("Disjoint Union of Four C4 Cycles")
    plt.show()
    return G

# Complete Bipartite Graph K16,16
def complete_bipartite_graph_k1616():
    G = nx.complete_bipartite_graph(16, 16)
    plt.figure(figsize=(12, 6))
    pos = nx.bipartite_layout(G, nodes=range(16))
    nx.draw(G, pos, with_labels=False, node_color=['lightcoral'] * 16 + ['lightblue
            edge_color='gray', node_size=100)
    plt.title("Complete Bipartite Graph K16,16")
    plt.show()
    return G

# 5-Dimensional Hypercube Graph Q5
def hypercube_graph_q5():
    G = nx.hypercube_graph(5)
    plt.figure(figsize=(10, 8))
    pos = nx.spring_layout(G, seed=42)
    nx.draw(G, pos, with_labels=False, node_color='lightgreen', edge_color='gray',
    plt.title("5-Dimensional Hypercube Graph Q5")
    plt.show()
    return G

# Tree Graph with 8 Vertices
def tree_graph_8():
    G = nx.balanced_tree(r=2, h=2)
    G.add_edge(6, 7)
    plt.figure(figsize=(8, 6))
    pos = nx.spring_layout(G, seed=42)
```

```python
    nx.draw(G, pos, with_labels=True, node_color='lightblue', edge_color='gray', no
    plt.title("Tree Graph with 8 Vertices")
    plt.show()
    return G


# Wheel Graph W16
def wheel_graph_w16():
    G = nx.wheel_graph(16)
    plt.figure(figsize=(8, 8))
    pos = nx.circular_layout(G)
    nx.draw(G, pos, with_labels=True, node_color='lightcoral', edge_color='gray', n
    plt.title("Wheel Graph W16")
    plt.show()
    return G


#-> Random Connected Graph with 16 Vertices
def random_connected_graph_16(p=0.15):
    #n, p = 16, 0.25
    n=16
    while True:
        G = nx.erdos_renyi_graph(n, p, seed=random.randint(1, 10000))
        if nx.is_connected(G):
            break
    plt.figure(figsize=(10, 8))
    pos = nx.spring_layout(G, seed=42)
    nx.draw(G, pos, with_labels=False, node_color='lightgreen', edge_color='gray',
    plt.title("Random Connected Graph with 16 Vertices")
    plt.show()
    return G


# Expander Graph with 32 Vertices
def expander_graph_32():
    G = nx.random_regular_graph(4, 32, seed=42)
    plt.figure(figsize=(10, 8))
    pos = nx.spring_layout(G, seed=42)
    nx.draw(G, pos, with_labels=False, node_color='lightblue', edge_color='gray', n
    plt.title("Expander Graph with 32 Vertices")
    plt.show()
    return G


#-> Expander Graph with n Vertices
def expander_graph_n(n):
    G = nx.random_regular_graph(4, n, seed=42)
    plt.figure(figsize=(10, 8))
    pos = nx.spring_layout(G, seed=42)
    nx.draw(G, pos, with_labels=False, node_color='lightblue', edge_color='gray', n
    plt.title("Expander Graph with {} Vertices".format(n))
    plt.show()
    return G


# Planar Connected Graph with 16 Vertices
def planar_connected_graph_16():
    G = nx.grid_graph(dim=[8, 2])
    G = nx.convert_node_labels_to_integers(G)
    additional_edges = [(0, 9), (1, 10), (2, 11), (3, 12), (4, 13), (5, 14), (6, 15
                        (7, 15), (8, 7)]#, (6, 15), (14, 1), (1, 13), (10, 9), (0,
```

```python
        G.add_edges_from([e for e in additional_edges if e[0] < 16 and e[1] < 16])
        assert nx.check_planarity(G)[0], "Graph is not planar."
        pos = {node: (node // 2, node % 2) for node in G.nodes()}
        plt.figure(figsize=(16, 8))
        nx.draw(G, pos, with_labels=False, node_color='lightcoral', edge_color='gray',
        plt.title("Planar Connected Graph with 16 Vertices")
        plt.axis('equal')
        plt.show()
        return G
```

We've suggested a few graph ideas above.

The list below highlights those achievable with minimal computational resources, whether on a local laptop or a cloud instance. Some are simply too large.
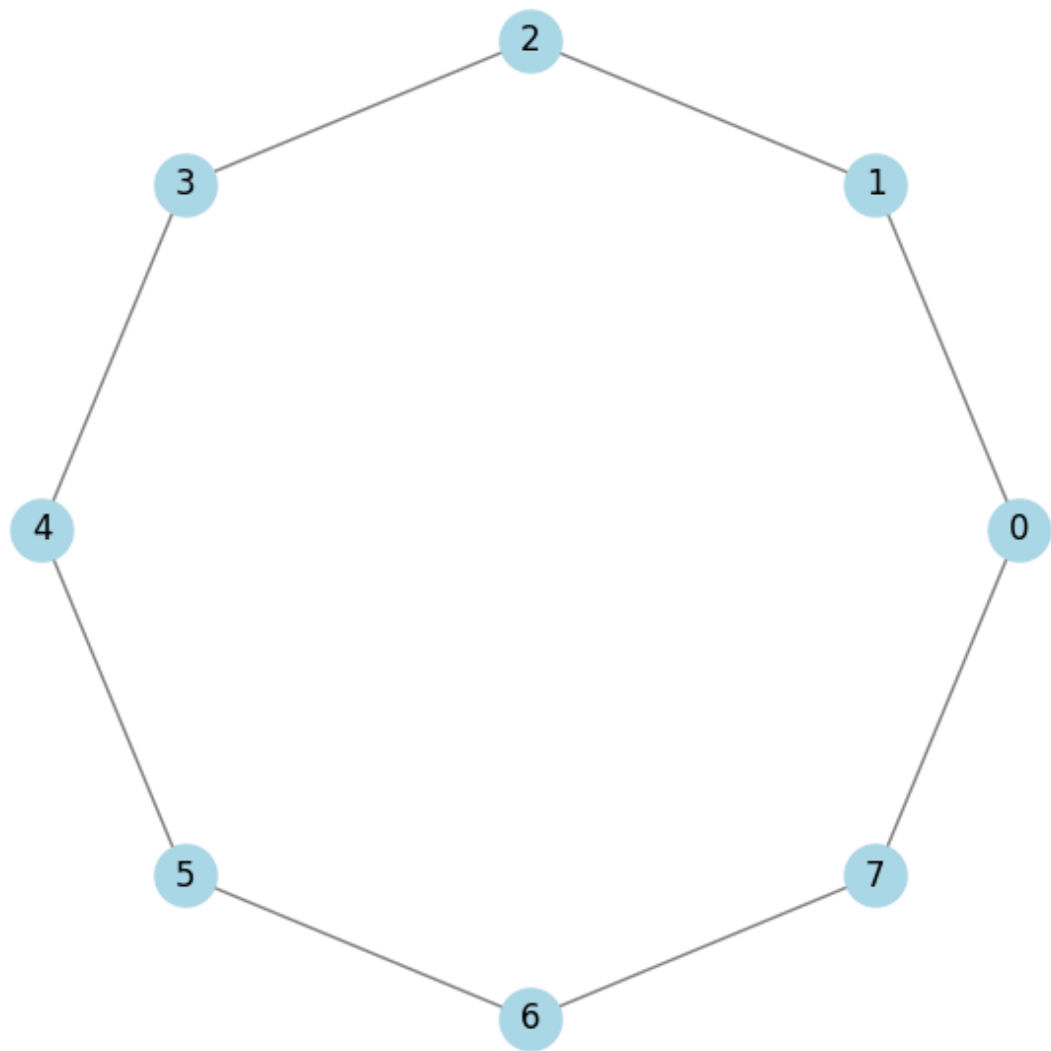
```python
In [5]:  # Choose your favorite graph and build your winning ansatz!

         graph1 = cycle_graph_c8()
         graph2 = complete_bipartite_graph_k88()
         graph3 = complete_bipartite_graph_k_nn(5)
         graph4 = regular_graph_4_8()
         graph5 = cubic_graph_3_16()
         graph6 = random_connected_graph_16(p=0.18)
         graph7 = expander_graph_n(16)
         #graph8 = -> make your own cool graph
```
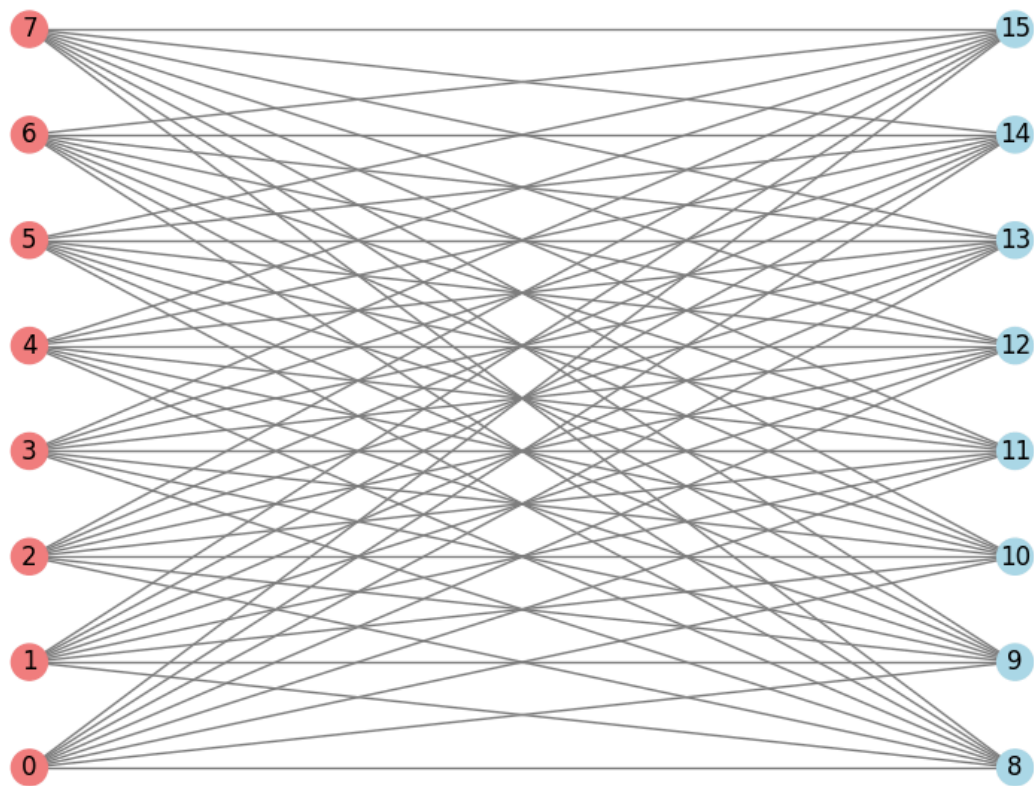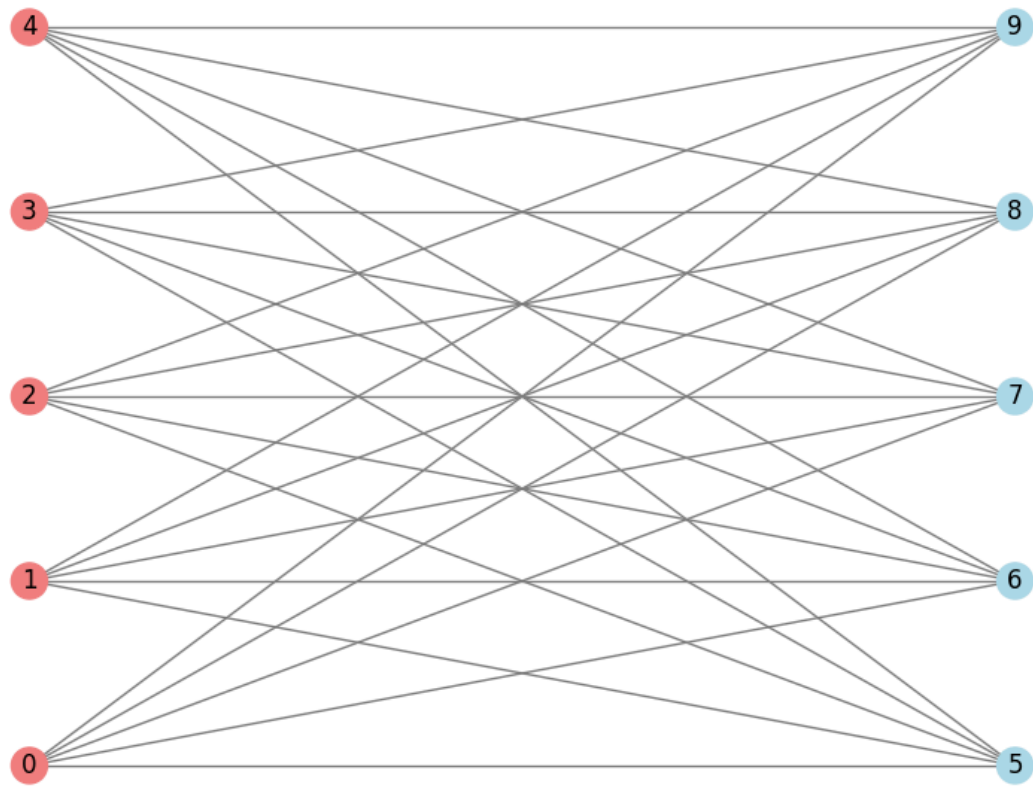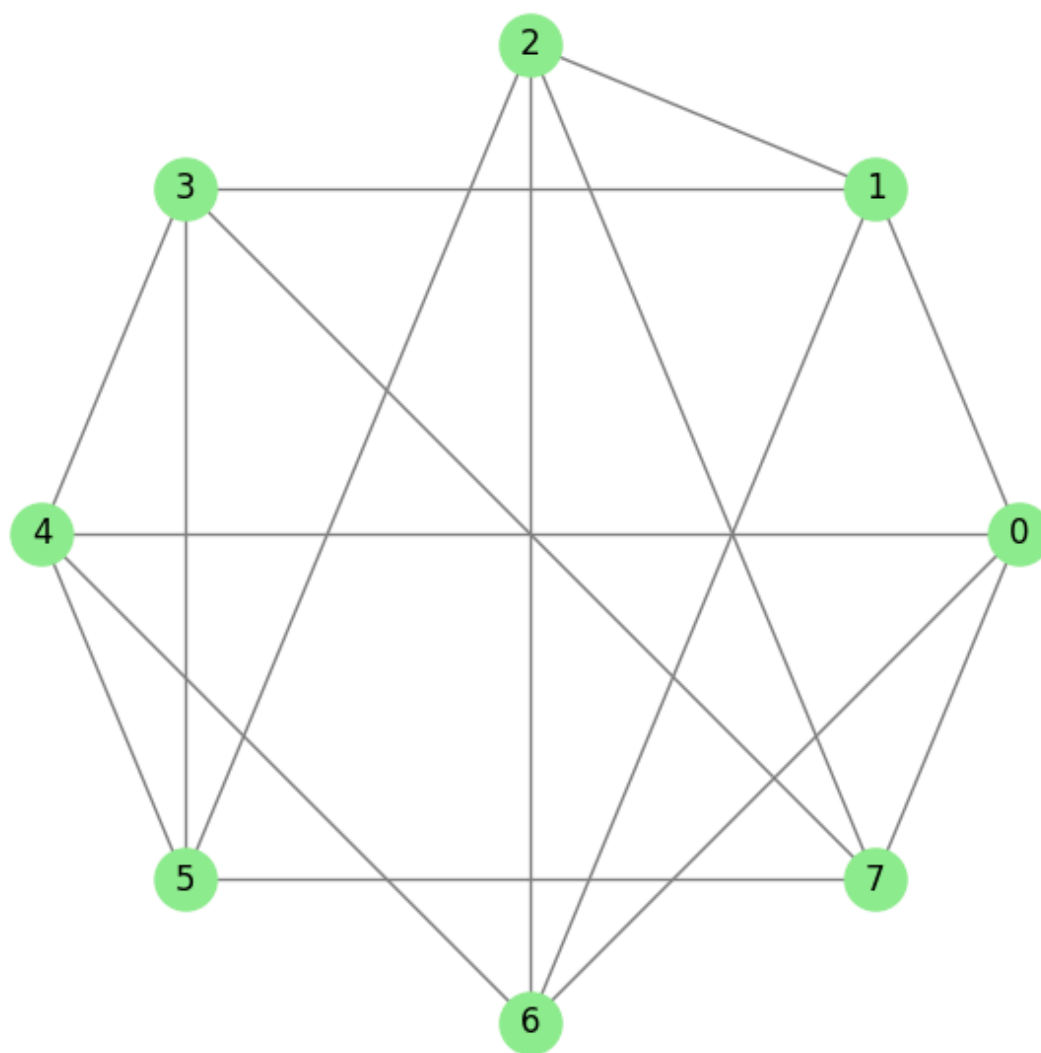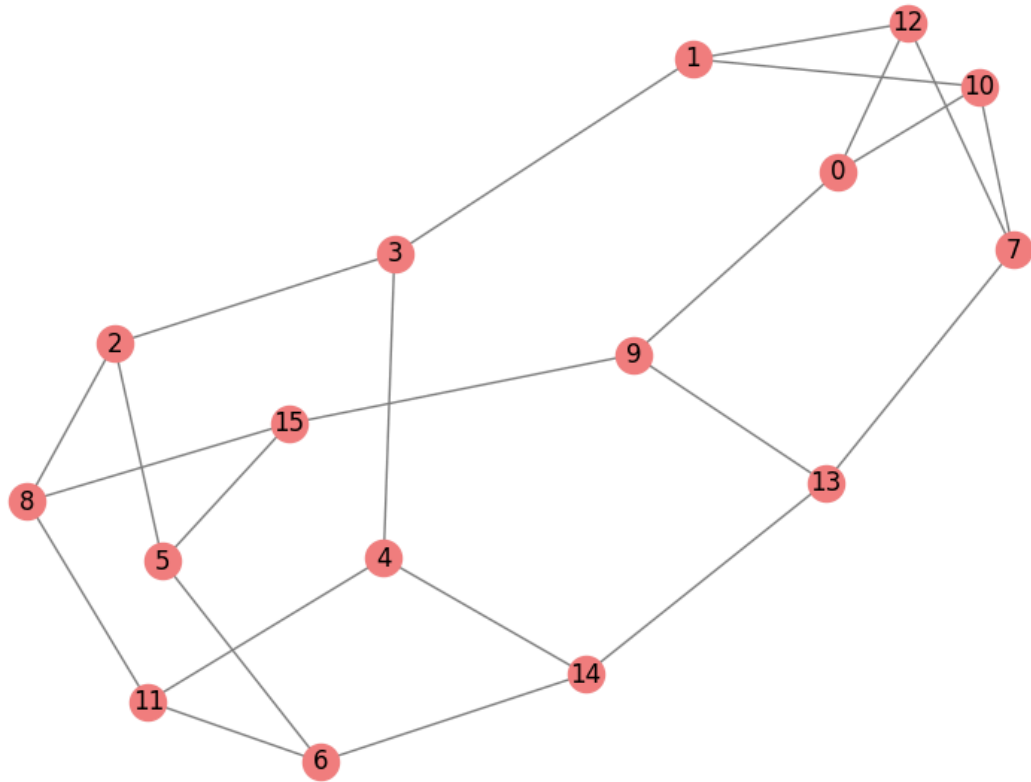
Cycle Graph C8

Complete Bipartite Graph K8,8

Complete Bipartite Graph K5,5

4-Regular Graph with 8 Vertices

Cubic (3-Regular) Graph with 16 Vertices

Random Connected Graph with 16 Vertices
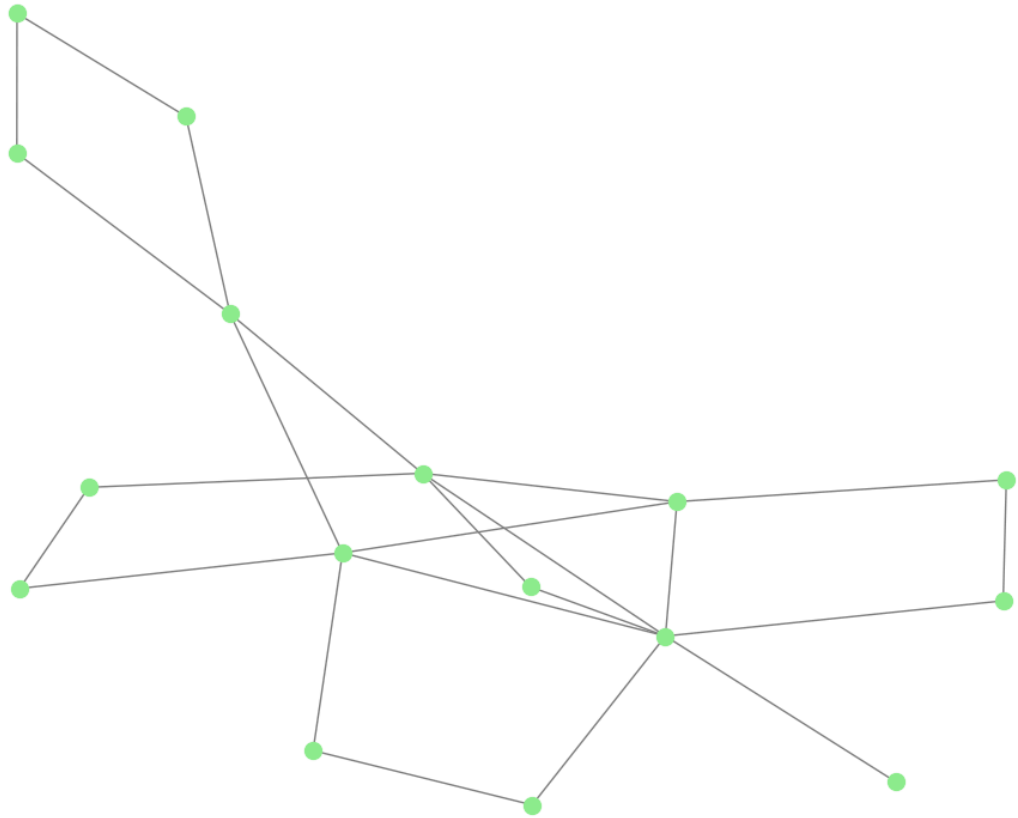
Expander Graph with 16 Vertices
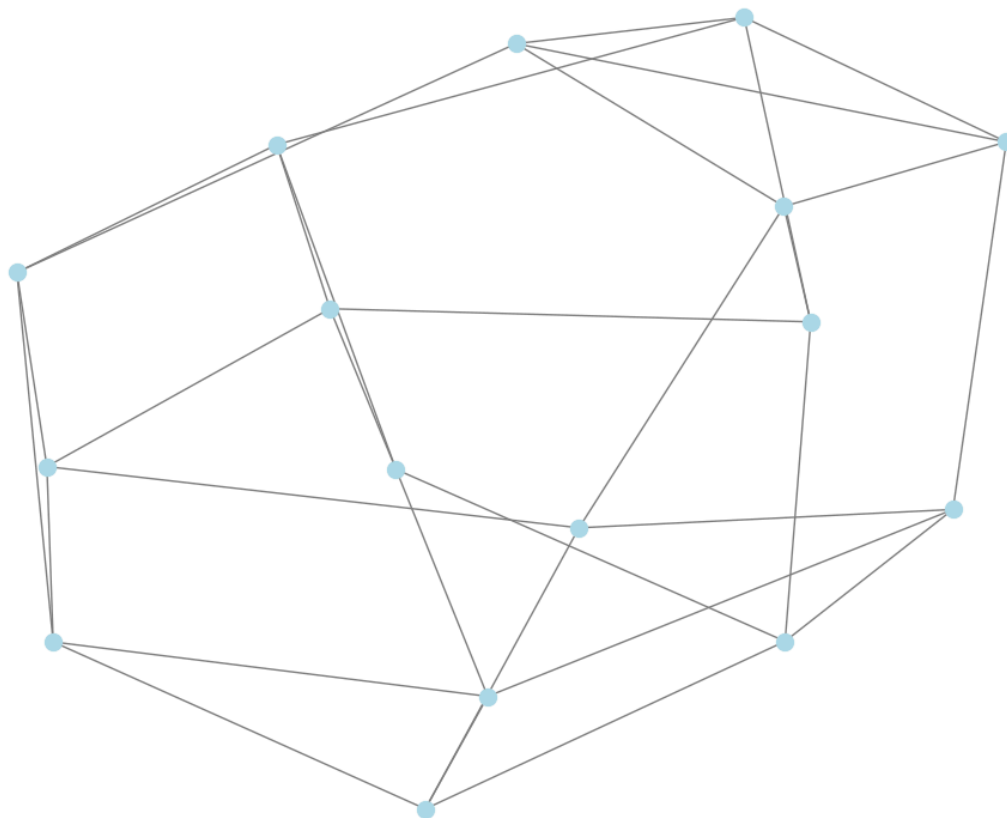

```
In [6]:  import cv2
         import matplotlib.pyplot as plt
         import networkx as nx
         import math

         map_width = 610#4425.696
         grid_size = 120
         connection_distance = 180


         white_tolerance = 240



         image_path = 'sat2.png'
         img = cv2.imread(image_path, cv2.IMREAD_GRAYSCALE)
         if img is None:
             raise IOError(f"Failed to load image at {image_path}")

         #create binary image (prob not needed anymore)
         _, working_img = cv2.threshold(img, white_tolerance, 255, cv2.THRESH_BINARY)
         img_height, img_width = working_img.shape


         scale = img_width / map_width   #pixels per meter
         grid_size_pixels = grid_size * scale
```

```python
#number of grid cols and rows based on grid cell size and image size
n_cols = int(img_width // grid_size_pixels)
n_rows = int(img_height // grid_size_pixels)

print(f"Image dimensions: {img_width}x{img_height} pixels")
print(f"Map width: {map_width} m, Grid cell size: {grid_size} m ({grid_size_pixels:
print(f"Grid dimensions: {n_cols} columns x {n_rows} rows")

G = nx.Graph()
for r in range(n_rows):
    for c in range(n_cols):
        #find center of grid in m
        center_m = ((c + 0.5) * grid_size, (r + 0.5) * grid_size)
        #find center of grid in px
        center_px = (center_m[0] * scale, center_m[1] * scale)
        G.add_node((r, c), center_m=center_m, center_px=center_px)


def flood_fill(img, start_x, start_y, target_value=255, fill_value=128):
    h, w = img.shape
    stack = [(start_x, start_y)]
    while stack:
        x, y = stack.pop()
        #prevent oob
        if x < 0 or x >= w or y < 0 or y >= h:
            continue

        if img[y, x] != target_value:
            continue
        img[y, x] = fill_value

        for dx in [-1, 0, 1]:
            for dy in [-1, 0, 1]:
                if dx == 0 and dy == 0:
                    continue
                nx_ = x + dx
                ny_ = y + dy
                if 0 <= nx_ < w and 0 <= ny_ < h and img[ny_, nx_] == target_value:
                    stack.append((nx_, ny_))


for r in range(n_rows):
    for c in range(n_cols):
        #boundaries of grid
        x0 = int(c * grid_size_pixels)
        x1 = int((c + 1) * grid_size_pixels)
        y0 = int(r * grid_size_pixels)
        y1 = int((r + 1) * grid_size_pixels)


        region = working_img[y0:y1, x0:x1]
        #any white px in grid then go, white pixel denotes a path/road
        if np.any(region == 255):
            #tmp image to prevent change to original image
            temp_img = working_img.copy()
            #fidn first white px
```

```python
                white_indices = np.argwhere(region == 255)
                if white_indices.size > 0:
                    first_idx = white_indices[0]
                    #convert from localcc to globalcc
                    start_y = y0 + first_idx[0]
                    start_x = x0 + first_idx[1]
                    #floodfill in mask/temp image
                    flood_fill(temp_img, start_x, start_y, target_value=255, fill_value

            # (Fourth-level iteration)
            #iterate over every grid cell to see if they have a marker in temp_img
            for r2 in range(n_rows):
                for c2 in range(n_cols):
                    # NO self connect
                    if (r, c) == (r2, c2):
                        continue
                    x0_d = int(c2 * grid_size_pixels)
                    x1_d = int((c2 + 1) * grid_size_pixels)
                    y0_d = int(r2 * grid_size_pixels)
                    y1_d = int((r2 + 1) * grid_size_pixels)
                    region_d = temp_img[y0_d:y1_d, x0_d:x1_d]
                    #any markers in grid then it is connected
                    if np.any(region_d == 128):
                        #euclid distance between grid centers
                        source_center = G.nodes[(r, c)]['center_m']
                        dest_center = G.nodes[(r2, c2)]['center_m']
                        dist = math.hypot(source_center[0] - dest_center[0],
                                          source_center[1] - dest_center[1])
                        if dist <= connection_distance: # ensure they are within di
                            G.add_edge((r, c), (r2, c2))


print(f"Graph has {G.number_of_nodes()} nodes and {G.number_of_edges()} edges.")

#floodfill w/ green using mask over original image to prevent changes to orig
img_color = cv2.cvtColor(working_img, cv2.COLOR_GRAY2BGR)
mask_green = (working_img == 128)
img_color[mask_green] = [0, 255, 0]

#BGR to RGB for mpl.
img_rgb = cv2.cvtColor(img_color, cv2.COLOR_BGR2RGB)

plt.figure(figsize=(10, 10))
plt.imshow(img_rgb)
plt.title("Flood-Filled Connectivity (Original Image Unchanged)")

#liness
for col in range(n_cols + 1):
    x = int(col * grid_size_pixels)
    plt.plot([x, x], [0, img_height], color='cyan', linewidth=1, alpha=0.5)
for row in range(n_rows + 1):
    y = int(row * grid_size_pixels)
    plt.plot([0, img_width], [y, y], color='cyan', linewidth=1, alpha=0.5)


node_positions = {node: G.nodes[node]['center_px'] for node in G.nodes()}
```

```python
# draw nodes
isolated_nodes = list(nx.isolates(G))
G.remove_nodes_from(isolated_nodes)

nx.draw_networkx_nodes(G, pos=node_positions, node_color='red', node_size=50, ax=pl
nx.draw_networkx_edges(G, pos=node_positions, edge_color='yellow', width=2, ax=plt.

plt.axis('off')
plt.show()

graph8 = G

# Create a mapping from old node labels to new integer labels (0 to 41)
new_labels = {old_label: new_idx for new_idx, old_label in enumerate(graph8.nodes()

# Relabel the graph
graph8 = nx.relabel_nodes(graph8, new_labels)

# Print to verify
print("New node labels:", graph8.nodes())
```
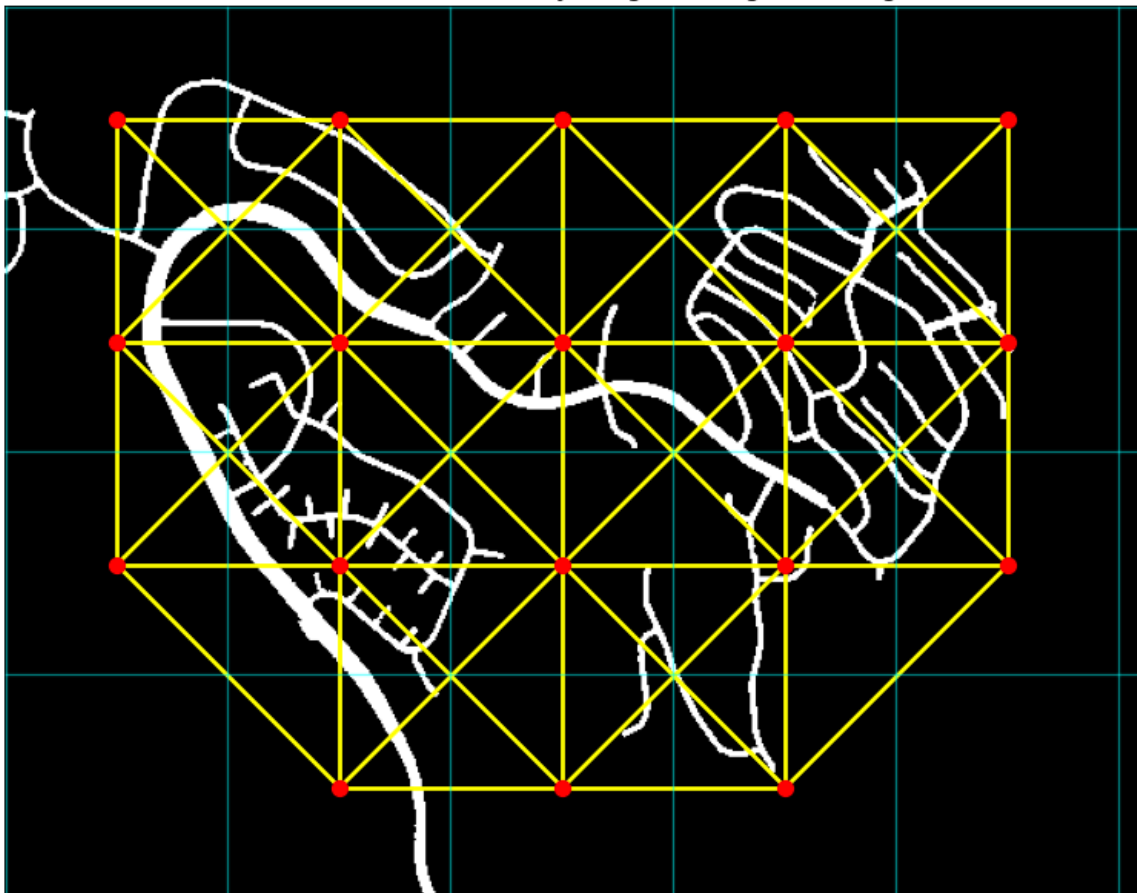
```
Image dimensions: 584x460 pixels
Map width: 610 m, Grid cell size: 120 m (114.9 px)
Grid dimensions: 5 columns x 4 rows
Graph has 20 nodes and 49 edges.
```

Flood-Filled Connectivity (Original Image Unchanged)

New node labels: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17]

Input graph

```
In [49]:   graph = graph6
           graph
```

Out[49]: `<networkx.classes.graph.Graph at 0x241d1f30990>`

Play around with all of them

Quantum Circuit Generator

We start by generating parameterized circuit based on a given graph.

🤓 Note: Future experiments will focus on optimizing this circuit generator (this function below). Maximizing your score requires minimizing the number of gates in the generated parameterized circuit.

Set of Rules:

Rules: Do not rename the function, import external libraries (except Qiskit), or use classical solvers. Implement any needed algorithms (e.g., sorting) within the function. Minimize gate count. Run locally for all the graphs before submitting the results.

Let's iterate again.

This challenge requires you to work within the provided function's name and scope. You may only use Qiskit libraries. Do not import additional libraries or call external functions. If your solution requires operations like sorting, implement them directly within the function. Critically, do *not* use a classical algorithm to solve the problem and simply input the result. Optimize your code to minimize the number of quantum gates, while aiming for the correct solutions distribution. Thoroughly get your solution results to report at the end.

Important note: To confirm your results, please save this notebook including all cell outputs and upload it in the form here: https://forms.gle/tAjnUd7b5t3oX3b2A . To avoid exceeding the notebook's 10MB file size limit, please be mindful of the number of print statements you use. Feel free to modify the notebook as needed. However, please ensure your code is readable. Please thoroughly comment your code; we will evaluate your problem-solving approach based on the educational clarity of your explanations.

Good luck, and have fun!

```
In [50]:   # Visualization will be performed in the cells below;

           def build_ansatz(graph: nx.Graph) -> QuantumCircuit:
```

```python
    ansatz = QuantumCircuit(graph.number_of_nodes())
    ansatz.h(range(graph.number_of_nodes()))

    theta = ParameterVector(r"$\theta$", graph.number_of_edges())
    for t, (u, v) in zip(theta, graph.edges):
        ansatz.cx(u, v)
        ansatz.ry(t, v)
        ansatz.cx(u, v)

    return ansatz
```

In [51]:
```python
# alternate method to make the ansatz

# function to generate a maximum spanning tree of the graph
def generate_max_spanning_tree(G):
    # for u, v in G.edges:
    #     G[u][v]['weight'] *= -1
    return nx.minimum_spanning_tree(G, algorithm='kruskal')

# function to return the graph with the spanning tree edges removed
def remove_spanning_tree_edges(G, T):
    H = G.copy()
    for edge in T.edges:
        H.remove_edge(*edge)
    return H
```

In [52]:
```python
# get the maximum spanning tree of the graph by negating all the edge weights and c
T = generate_max_spanning_tree(graph)

# remove the edges of the spanning tree from the graph
H = remove_spanning_tree_edges(graph, T)

# visualize the tree and the graph with the tree edges removed
plt.figure(figsize=(12, 6))
plt.subplot(121)
pos = nx.circular_layout(graph)
nx.draw(graph, pos, with_labels=True, node_color='lightblue', edge_color='gray', no
nx.draw_networkx_edges(T, pos, edge_color='red', width=2)
plt.title("Graph with Maximum Spanning Tree")
```

Out[52]: Text(0.5, 1.0, 'Graph with Maximum Spanning Tree')

Graph with Maximum Spanning Tree
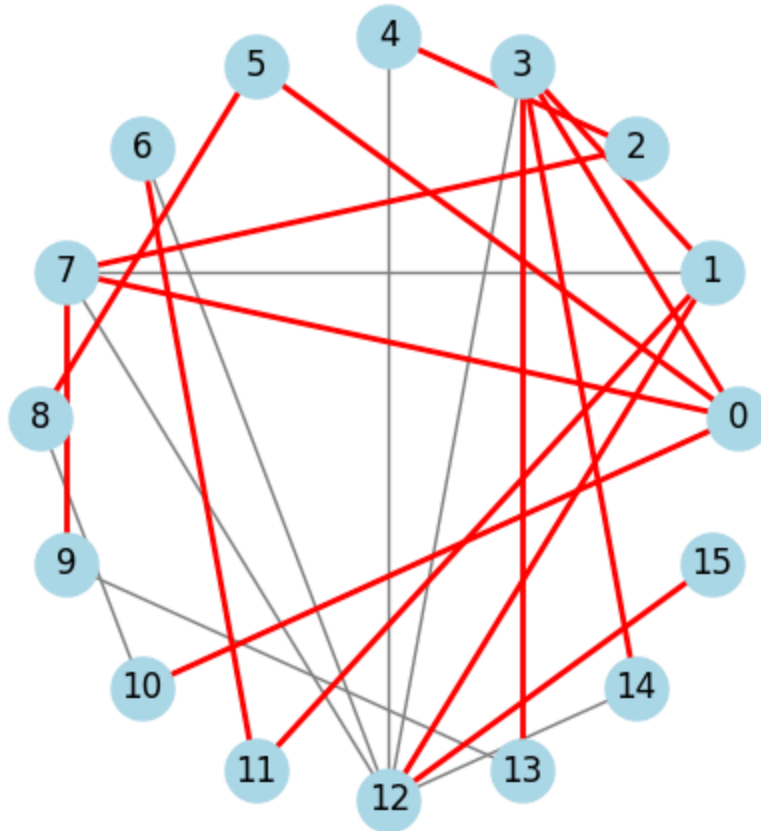

```
In [53]:   # build the ansatz circuit for both T and H
           ansatz_T = build_ansatz(T)
           ansatz_H = build_ansatz(H)
```

```
In [54]:   # visualize the ansatz circuit for the tree
           ansatz_T.draw("mpl", fold=-1)
```

Out[54]:

```
In [55]:  # visualize the ansatz circuit for the graph with the tree edges removed
          ansatz_H.draw("mpl", fold=-1)
```

Out[55]:
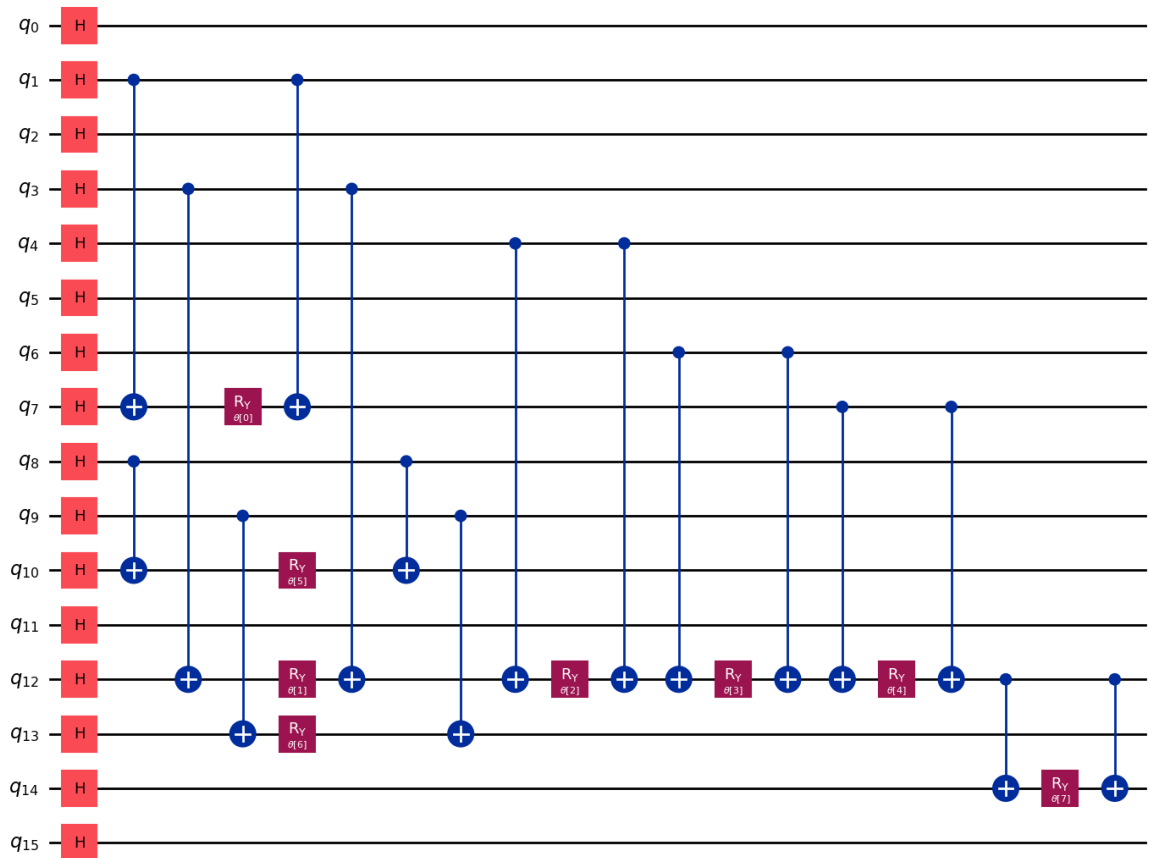
On Parametrized Quantum Circuits

Parametrized quantum circuits (PQC) recently have gained significant attention as a prominent way to reach quantum advantage in many different fields. They are characterized by their use of varying parameters within quantum 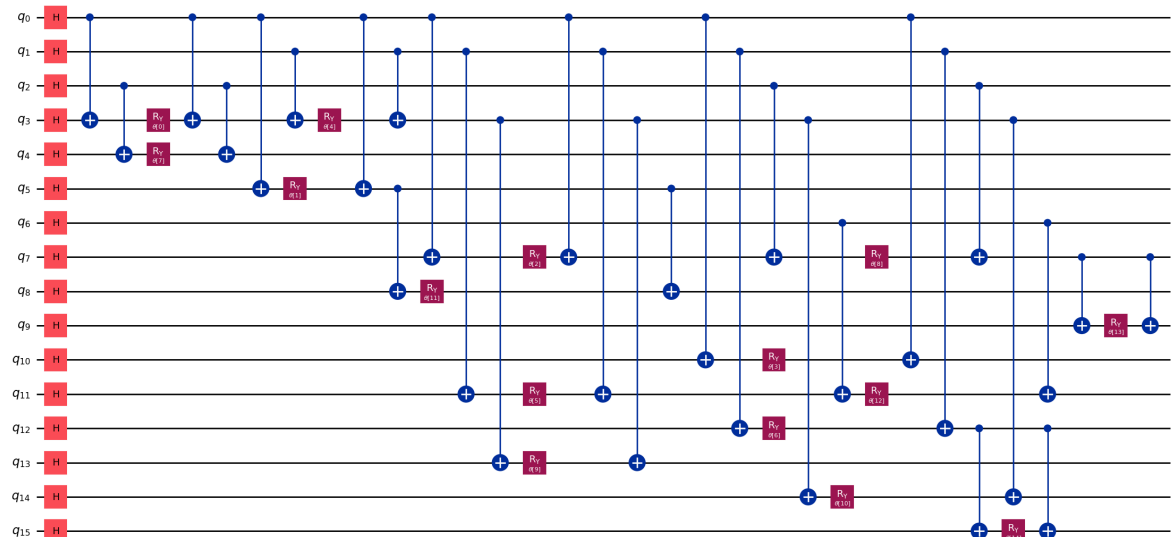gates and can be optimized to solve specific problems, such as machine learning, quantum optimization, or quantum chemistry.

PQCs usually consist of three main parts:

1. Initialization: The qubits are set to a known starting state (usually $|0\rangle$) and then set into superposition with Hadamard gates.
2. Parameterized gates, such as rotation gates (Rx, Ry, Rz), and entanglement gates are adjustable. Their parameters can be optimized to reflect the relationships between the encoded problem data.
3. Measurement: After applying the parameterized gates, the qubits are measured to get results.

These circuits are important elements in Variational Quantum Algorithms (VQA), hybrid quantum-classical systems where classical optimization helps to improve quantum

operations. Two most notable examples of VQAs are Variational Quantum Eigensolver (VQE), an algorithm that finds a ground state energy of a given Hamiltonian, and Quantum Approximate Optimization Algorithm (QAOA), which is designed for solving combinatorial optimization problems. Near-term quantum computers are noisy and limited in size, and PQCs provide a practical way for us to use them more effectively.

More on that topic: https://arxiv.org/abs/2207.06850

Back to the problem in hand

This function produces parametrized quantum circuits (PQCs), a visualization of which is provided below.

```
In [56]:  ansatz = build_ansatz(graph)
          ansatz.draw("mpl", fold=-1)
```

Out[56]:
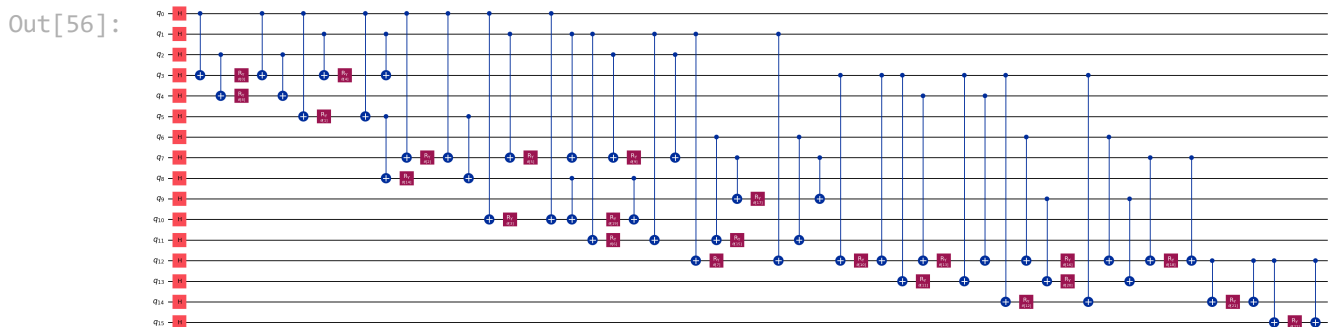
Building the MaxCut Hamiltonian

Formally, we write MaxCut as a Quadratic Program (QP) with binary decision variables as follows. For each node $v \in V$, we let x_v denote a binary variable indicating whether v belongs to S or T. The objective is to maximize the number of cut edges:

$$\text{maximize}_x \quad \sum_{(v,w) \in E} (x_v + x_w - 2x_v x_w)$$

Let's break this down. Notice that for each edge $e = (v, w)$ in the graph, the quantity $(x_v + x_w - 2x_v x_w)$ indicates whether e is *cut* by the partition represented by x; that is, the quantity $(x_v + x_w - 2x_v x_w)$ is zero or one, and it equals one only if v and w lie on different sides of the partition specified by x.

The code cell below obtains a symbolic representation of the maximization objective corresponding to the graph above.

Run the Hamiltonian function according to the challenge mentioned in the function name. If nothing is specified, it is for part 1.

In [57]:
```python
def build_maxcut_hamiltonian(graph: nx.Graph) -> SparsePauliOp:
    """
    Build the MaxCut Hamiltonian for the given graph H = (|E|/2)*I - (1/2)*Σ_{(i,j)
    """
    num_qubits = len(graph.nodes)
    edges = list(graph.edges())
    num_edges = len(edges)

    pauli_terms = ["I"*num_qubits] # start with identity
    coeffs = [-num_edges / 2]

    for (u, v) in edges: # for each edge, add -(1/2)*Z_i Z_j
        z_term = ["I"] * num_qubits
        z_term[u] = "Z"
        z_term[v] = "Z"
        pauli_terms.append("".join(z_term))
        coeffs.append(0.5)

    return SparsePauliOp.from_list(list(zip(pauli_terms, coeffs)))
```

In [58]:
```python
def build_maxcut_hamiltonian_part2(graph: nx.Graph) -> SparsePauliOp:
    """
    Build the MaxCut Hamiltonian for the given graph H = (|E|/2)*I - (1/2)*Σ_{(i,j)
    """
    num_qubits = len(graph.nodes)
    edges = list(graph.edges())
    num_edges = len(edges)

    pauli_terms = ["I"*num_qubits] # start with identity
    coeffs = [-num_edges / 2]

    for (u, v) in edges: # for each edge, add -(1/2)*Z_i Z_j
        z_term = ["I"] * num_qubits
        z_term[u] = "Z"
        z_term[v] = "Z"
        pauli_terms.append("".join(z_term))
        coeffs.append(0.5)

    for n in nodes:
        z_term = ["I"]*num_qubits
        z_term[n] = "Z"
        pauli_terms.append("".join(z_term))
        coeffs.append(1.0)

    return SparsePauliOp.from_list(list(zip(pauli_terms, coeffs)))
```

In [59]:
```python
def build_maxcut_hamiltonian_part3(graph: nx.Graph, minimumSpanningTree: nx.Graph)
    """
    Build the MaxCut Hamiltonian for the given graph H = (|E|/2)*I - (1/2)*Σ_{(i,j)
    """
    num_qubits = len(graph.nodes)
    nodes = list(graph.nodes())
    edges = list(graph.edges())
    num_edges = len(edges)
```

```python
        pauli_terms = ["I"*num_qubits] # start with identity
        coeffs = [-num_edges / 2]

        for (u, v) in edges: # for each edge, add -(1/2)*Z_i Z_j
            z_term = ["I"] * num_qubits
            z_term[u] = "Z"
            z_term[v] = "Z"
            pauli_terms.append("".join(z_term))
            # coeffs.append(0.5)
            if (u,v) in minimumSpanningTree.edges:
                #   coeffs.append(-((num_qubits / 2) + 1))
                coeffs.append(-0.5)
            else: coeffs.append(0.5)

        return SparsePauliOp.from_list(list(zip(pauli_terms, coeffs)))
```

```
In [60]:  # get the maxcut hamiltonian for the tree
          H_maxcut_T = build_maxcut_hamiltonian(T)

          # get the maxcut hamiltonian for the graph with the tree edges removed
          H_maxcut_H = build_maxcut_hamiltonian(H)
```

```
In [61]:  print(H_maxcut_T)
          print(H_maxcut_H)
```

```
SparsePauliOp(['IIIIIIIIIIIIIIII', 'ZIIZIIIIIIIIIIII', 'ZIIIIZIIIIIIIIII', 'ZIIIIIIZ
IIIIIIII', 'ZIIIIIIIIZIIIIII', 'IZIZIIIIIIIIIIII', 'IZIIIIIIIIIZIIII', 'IZIIIIIIIIIII
ZIII', 'IIZIZIIIIIIIIIII', 'IIZIIIIZIIIIIIII', 'IIIZIIIIIIIIIZII', 'IIIZIIIIIIIIIIIZ
I', 'IIIIIZIIZIIIIIII', 'IIIIIIZIIIIZIIII', 'IIIIIIIZIZIIIIII', 'IIIIIIIIIIIIZIIZ'],
              coeffs=[-7.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,
0.5+0.j,
  0.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,
  0.5+0.j,  0.5+0.j])
SparsePauliOp(['IIIIIIIIIIIIIIII', 'IZIIIIIZIIIIIIII', 'IIIZIIIIIIIIZIII', 'IIIIZIII
IIIIZIII', 'IIIIIIZIIIIIZIII', 'IIIIIIIZIIIIZIII', 'IIIIIIIIZIZIIIII', 'IIIIIIIIIZII
IZII', 'IIIIIIIIIIIIZIZI'],
              coeffs=[-4. +0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,  0.5+0.j,
0.5+0.j,
  0.5+0.j,  0.5+0.j])
```

Let's keep this function contained within its own cell, as you might need to adapt it for various max-cut problem types later.

```
In [62]:  ham = build_maxcut_hamiltonian(graph)
          # ham = build_maxcut_hamiltonian_part2(graph)
          # ham = build_maxcut_hamiltonian_part3(graph, T)
          ham
```

```
Out[62]:  SparsePauliOp(['IIIIIIIIIIIIIIII', 'ZIIZIIIIIIIIIIII', 'ZIIIIZIIIIIIIIII', 'ZIIIII
          IZIIIIIIIII', 'ZIIIIIIIIIZIIIII', 'IZIZIIIIIIIIIIII', 'IZIIIIIZIIIIIIII', 'IZIIIIII
          IIIZIIII', 'IZIIIIIIIIIIZIII', 'IIZIZIIIIIIIIIII', 'IIZIIIIZIIIIIIII', 'IIIZIIIIII
          IIZIII', 'IIIZIIIIIIIIIZII', 'IIIZIIIIIIIIIIZI', 'IIIIZIIIIIIIZIII', 'IIIIIZIIZIII
          IIII', 'IIIIIIZIIIIZIIII', 'IIIIIIZIIIIIZIII', 'IIIIIIIZIZIIIIII', 'IIIIIIIZIIIIZI
          II', 'IIIIIIIIZIZIIIII', 'IIIIIIIIIZIIIZII', 'IIIIIIIIIIIIZIZI', 'IIIIIIIIIIIIZII
          Z'],
                        coeffs=[-11.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5
          +0.j,
            0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,
            0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,
            0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j,   0.5+0.j])
```

As a Hamiltonian energy minimization problem

Quantum MaxCut

Quantum computers are good at finding the ground state of particle systems evolving under the action of a given Hamiltonian. In this section, we'll construct a Hamiltonian whose energies are exactly the values of the MaxCut objective function. This correspondence will effectively translate our classical combinatorial optimization problem into a quantum problem, which we'll approach using our novel heuristic.

Given an objective function $C(x)$, with domain $x \in \{0, 1\}^n$, we'll produce a Hamiltonian H_C on n qubits such that

$$H_C \ket{x} = C(x)\ket{x}.$$

In the last equation, $\ket{x}$ denotes the n-qubit computational basis state indexed by the bit-string $x \in \{0, 1\}$. Thus the last equation says each of the 2^n computational basis states is an eigenvector of H_C, and the eigenvalue corresponding to $\ket{x}$ is $C(x)$; that is, H_C is diagonal with respect to the computational basis, and its energies are the values of the objective function C.

We'll obtain the Hamiltonian H_C by replacing each x_j in the expression of $C(x)$ by the operator

$$\hat{X}_j \coloneqq \frac{1}{2}(I - Z_j),$$

where I denotes the identity operator on n qubits and Z_j denotes the Pauli-Z operator acting on the jth qubit. Notice that $\hat{X}_j$ is diagonal with respect to the computational basis, and its eigenvalues are zero and one; in particular,

$$\hat{X}_j \ket{x} = x_j \ket{x}.$$

MaxCut Hamiltonian

When we apply the Ising map construction to the MaxCut objective

$$M(x) = \sum_{(v,w)\in E} (x_v + x_w - 2x_v x_w)$$

we obtain the Hamiltonian

$$H_M = \sum_{(v,w)\in E} (X_v + X_w - 2X_v X_w) = \frac{1}{2}\sum_{(v,w)\in E}\left(2I - Z_v - Z_w - (I - Z_v)(I - Z_w)\right) = \frac{1}{2}|$$

In the last equation, $|E|$ denotes the number of edges in the graph.

Energy minimization via QITE

Enter varQITE

With the MaxCut Hamiltonian in hand, we can turn to minimizing its energy using our novel quantum-classical varQITE heuristic. Much like any Variataional Quantum Algorithm (VQA), our novel varQITE method provides a recipe for iteratively updating the parameters in a variational quantum circuit to minimize the expectation value of the MaxCut Hamiltonian, measured with respect to the parametrized state.

A key novelty is that our varQITE algorithm does *not* rely on a classical optimizer to update the circuit parameters; instead, it specifies an explicit update rule based on the solution of a system linear Ordinary Differential Equations (ODEs). The ODEs relate the gradient of the variational circuit parameters to the expected value of certain operators related to the MaxCut Hamiltonian, and they are derived from an Ehrenfest Theorem that applies to imaginary time evolution. For details, see Equation (5) in our varQITE paper.

In any case, setting up the ODE system at each step of the algorithm requires executing a batch of quantum circuits and running some post-processing to evaluate the results.

The code cell below illustrates how to set up the variational ansatz $\ket\Psi(\theta)$ introduced by our varQITE paper in Equation (2). We'll set up the required circuits and the ODEs further down.

Below is simplified version of Quantum Imaginary Time Evolution (QITE). It uses a finite differences approach to estimate gradients, then performs gradient descent updates.

```
In [63]:  class QITEvolver:
              """
              A class to evolve a parametrized quantum state under the action of an Ising
              Hamiltonian according to the variational Quantum Imaginary Time Evolution
              (QITE) principle described in IonQ's latest joint paper with ORNL.
              """
              def __init__(self, hamiltonian: SparsePauliOp, ansatz: QuantumCircuit):
                  self.hamiltonian = hamiltonian
                  self.ansatz = ansatz
```

```python
        # Define some constants
        self.backend = AerSimulator()
        self.num_shots = 10000
        self.energies, self.param_vals, self.runtime = list(), list(), list()

    def evolve(self, num_steps: int, lr: float = 0.4, verbose: bool = True):
        """
        Evolve the variational quantum state encoded by ``self.ansatz`` under
        the action of ``self.hamiltonian`` according to varQITE.
        """
        curr_params = np.zeros(self.ansatz.num_parameters)
        for k in range(num_steps):
            # Get circuits and measure on backend
            iter_qc = self.get_iteration_circuits(curr_params)
            job = self.backend.run(iter_qc, shots=self.num_shots)
            q0 = time.time()
            measurements = job.result().get_counts()
            quantum_exec_time = time.time() - q0

            # Update parameters-- set up defining ODE and step forward
            Gmat, dvec, curr_energy = self.get_defining_ode(measurements)
            dcurr_params = np.linalg.lstsq(Gmat, dvec, rcond=1e-2)[0]
            curr_params += lr * dcurr_params

            # Progress checkpoint!
            if verbose:
                self.print_status(measurements)
            self.energies.append(curr_energy)
            self.param_vals.append(curr_params.copy())
            self.runtime.append(quantum_exec_time)

    def get_defining_ode(self, measurements: List[dict[str, int]]):
        """
        Construct the dynamics matrix and load vector defining the varQITE
        iteration.
        """
        # Load sampled bitstrings and corresponding frequencies into NumPy arrays
        dtype = np.dtype([("states", int, (self.ansatz.num_qubits,)), ("counts", "f
        measurements = [np.fromiter(map(lambda kv: (list(kv[0]), kv[1]), res.items(

        # Set up the dynamics matrix by computing the gradient of each Pauli word
        # with respect to each parameter in the ansatz using the parameter-shift ru
        pauli_terms = [SparsePauliOp(op) for op, _ in self.hamiltonian.label_iter()
        Gmat = np.zeros((len(pauli_terms), self.ansatz.num_parameters))
        for i, pauli_word in enumerate(pauli_terms):
            for j, jth_pair in enumerate(zip(measurements[1::2], measurements[2::2]
                for pm, pm_shift in enumerate(jth_pair):
                    Gmat[i, j] += (-1)**pm * expected_energy(pauli_word, pm_shift)

        # Set up the load vector
        curr_energy = expected_energy(self.hamiltonian, measurements[0])
        dvec = np.zeros(len(pauli_terms))
        for i, pauli_word in enumerate(pauli_terms):
            rhs_op_energies = get_ising_energies(pauli_word, measurements[0]["state
            rhs_op_energies *= get_ising_energies(self.hamiltonian, measurements[0]
```

```python
                dvec[i] = -np.dot(rhs_op_energies, measurements[0]["counts"]) / self.nu
            return Gmat, dvec, curr_energy

        def get_iteration_circuits(self, curr_params: np.array):
            """
            Get the bound circuits that need to be evaluated to step forward
            according to QITE.
            """
            # Use this circuit to estimate your Hamiltonian's expected value
            circuits = [self.ansatz.assign_parameters(curr_params)]

            # Use these circuits to compute gradients
            for k in np.arange(curr_params.shape[0]):
                for j in range(2):
                    pm_shift = curr_params.copy()
                    pm_shift[k] += (-1)**j * np.pi/2
                    circuits += [self.ansatz.assign_parameters(pm_shift)]

            # Add measurement gates and return
            [qc.measure_all() for qc in circuits]
            return circuits

        def plot_convergence(self):
            """
            Plot the convergence of the expected value of ``self.hamiltonian`` with
            respect to the (imaginary) time steps.
            """
            plt.plot(self.energies)
            plt.xlabel("(Imaginary) Time step")
            plt.ylabel("Hamiltonian energy")
            plt.title("Convergence of the expected energy")

        def print_status(self, measurements):
            """
            Print summary statistics describing a QITE run.
            """
            stats = pd.DataFrame({
                "curr_energy": self.energies,
                "num_circuits": [len(measurements)] * len(self.energies),
                "quantum_exec_time": self.runtime
            })
            stats.index.name = "step"
            display.clear_output(wait=True)
            display.display(stats)
```

A few utility functions:

```python
In [64]: def compute_cut_size(graph, bitstring):
            """
            Get the cut size of the partition of ``graph`` described by the given
            ``bitstring``.
            """
            cut_sz = 0
            for (u, v) in graph.edges:
                if bitstring[u] != bitstring[v]:
```

```
                cut_sz += 1
        return cut_sz
```

In [65]:
```python
def get_ising_energies(
        operator: SparsePauliOp,
        states: np.array
):
    """
    Get the energies of the given Ising ``operator`` that correspond to the
    given ``states``.
    """
    # Unroll Hamiltonian data into NumPy arrays
    paulis = np.array([list(ops) for ops, _ in operator.label_iter()]) != "I"
    coeffs = operator.coeffs.real

    # Vectorized energies computation
    energies = (-1) ** (states @ paulis.T) @ coeffs
    return energies
```

In [66]:
```python
def expected_energy(
        hamiltonian: SparsePauliOp,
        measurements: np.array
):
    """
    Compute the expected energy of the given ``hamiltonian`` with respect to
    the observed ``measurement``.

    The latter is assumed to by a NumPy records array with fields ``states``
    --describing the observed bit-strings as an integer array-- and ``counts``,
    describing the corresponding observed frequency of each state.
    """
    energies = get_ising_energies(hamiltonian, measurements["states"])
    return np.dot(energies, measurements["counts"]) / measurements["counts"].sum()
```

In [67]:
```python
def interpret_solution(graph, bitstring):
    """
    Visualize the given ``bitstring`` as a partition of the given ``graph``.
    """
    pos = nx.spring_layout(graph, seed=42)
    set_0 = [i for i, b in enumerate(bitstring) if b == '0']
    set_1 = [i for i, b in enumerate(bitstring) if b == '1']

    plt.figure(figsize=(4, 4))
    nx.draw_networkx_nodes(graph, pos=pos, nodelist=set_0, node_color='blue', node_
    nx.draw_networkx_nodes(graph, pos=pos, nodelist=set_1, node_color='red', node_s

    cut_edges = []
    non_cut_edges = []
    for (u, v) in graph.edges:
        if bitstring[u] != bitstring[v]:
            cut_edges.append((u, v))
        else:
            non_cut_edges.append((u, v))

    nx.draw_networkx_edges(graph, pos=pos, edgelist=non_cut_edges, edge_color='gray
```

```python
        nx.draw_networkx_edges(graph, pos=pos, edgelist=cut_edges, edge_color='green',

        nx.draw_networkx_labels(graph, pos=pos, font_color='white', font_weight='bold')
        plt.axis('off')
        plt.show()
```

In [68]:
```python
%%time

# Set up your QITEvolver and evolve!
qit_evolver = QITEvolver(ham, ansatz)
qit_evolver.evolve(num_steps=40, lr=0.1, verbose=True) # lr was 0.5

# Visualize your results!
qit_evolver.plot_convergence()
```

step	curr_energy	num_circuits	quantum_exec_time
0	-11.4997	47	4.531411
1	-11.0737	47	7.148879
2	-11.6510	47	6.279254
3	-11.3893	47	5.074939
4	-11.8301	47	5.277803
5	-11.7958	47	5.611534
6	-11.7418	47	5.837431
7	-11.7290	47	6.300905
8	-11.6943	47	6.347305
9	-11.9196	47	6.387012
10	-12.0287	47	3.636760
11	-12.1719	47	3.787590
12	-11.8887	47	4.039682
13	-12.2494	47	3.494109
14	-12.1545	47	3.795319
15	-12.1282	47	3.747427
16	-12.4965	47	3.637380
17	-12.6982	47	3.845154
18	-12.8174	47	5.321351
19	-12.7634	47	5.175072
20	-12.6597	47	5.082920
21	-12.7467	47	3.679118
22	-12.5604	47	3.526553
23	-12.6361	47	3.531796
24	-12.6303	47	3.168073
25	-12.9449	47	3.734898
26	-12.9109	47	3.798885
27	-12.3931	47	3.731754
28	-12.4983	47	3.589969

	curr_energy	num_circuits	quantum_exec_time
step			
29	-12.7264	47	3.937461
30	-12.6852	47	3.857587
31	-12.6122	47	3.675580
32	-12.7442	47	3.435137
33	-12.7819	47	3.737776
34	-12.8607	47	3.611537
35	-12.8839	47	3.785286
36	-12.7052	47	3.786613
37	-12.7195	47	3.597434
38	-12.8626	47	3.875527

```
CPU times: total: 21min 26s
Wall time: 3min 54s
```


Convergence of the expected energy
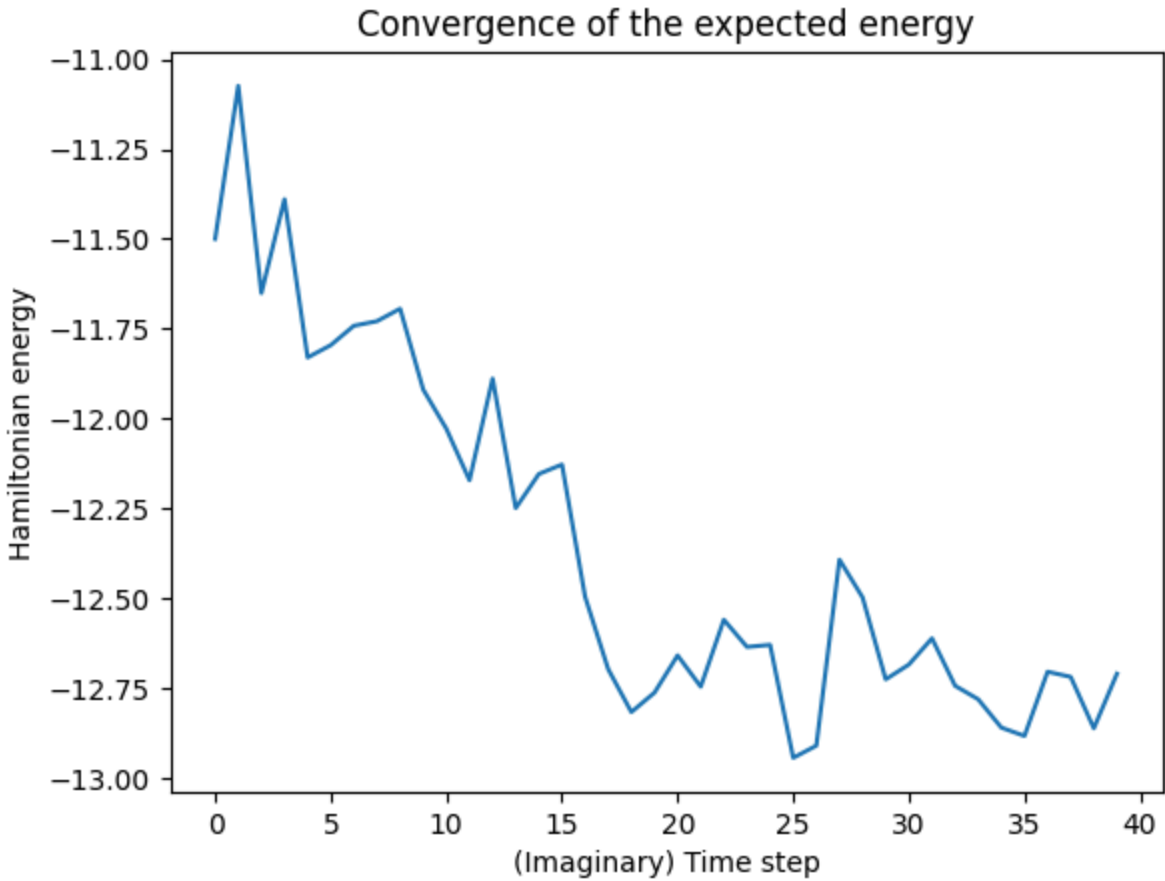
```
In [69]: %%time

         # comment this out for challenge 2 and 3
         # Set up QITEvolver for the tree
```
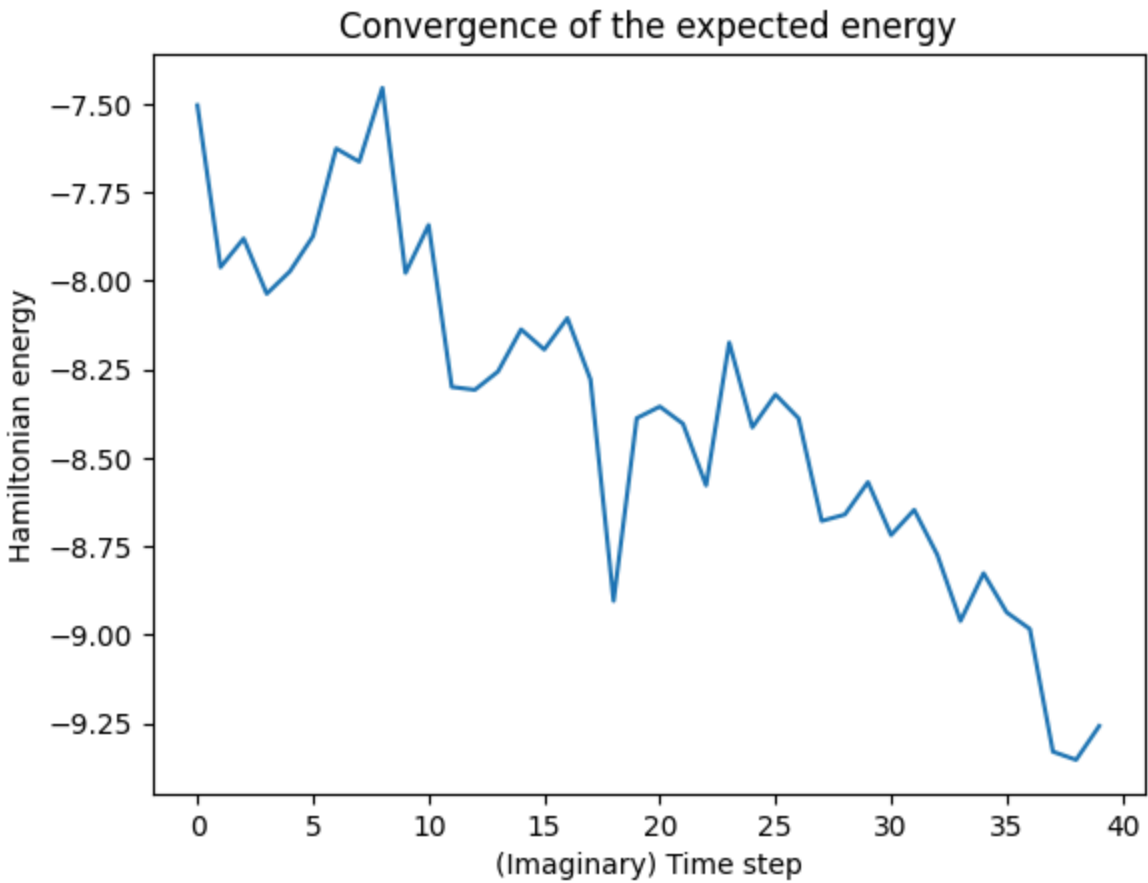
```python
qit_evolver_T = QITEvolver(H_maxcut_T, ansatz_T)
qit_evolver_T.evolve(num_steps=40, lr=0.1, verbose=True)

# Visualize your results!
qit_evolver_T.plot_convergence()
```

step	curr_energy	num_circuits	quantum_exec_time
0	-7.5049	31	3.004721
1	-7.9623	31	2.152972
2	-7.8811	31	2.169296
3	-8.0372	31	2.485893
4	-7.9741	31	2.398379
5	-7.8747	31	2.499324
6	-7.6268	31	2.470376
7	-7.6644	31	2.353066
8	-7.4555	31	2.159351
9	-7.9783	31	2.445324
10	-7.8431	31	2.368010
11	-8.3005	31	2.071396
12	-8.3086	31	2.268838
13	-8.2569	31	2.263864
14	-8.1379	31	2.322238
15	-8.1948	31	2.090206
16	-8.1060	31	1.970061
17	-8.2793	31	2.364870
18	-8.9048	31	1.808870
19	-8.3888	31	2.179390
20	-8.3559	31	2.494410
21	-8.4044	31	2.459723
22	-8.5786	31	1.974583
23	-8.1749	31	2.121223
24	-8.4147	31	2.301111
25	-8.3219	31	2.235572
26	-8.3892	31	2.087018
27	-8.6791	31	2.216192
28	-8.6609	31	1.952168

	curr_energy	num_circuits	quantum_exec_time
step			
29	-8.5694	31	2.303013
30	-8.7189	31	2.351671
31	-8.6477	31	2.266589
32	-8.7749	31	2.220908
33	-8.9615	31	2.162732
34	-8.8268	31	2.163033
35	-8.9374	31	2.137144
36	-8.9841	31	2.338061
37	-9.3308	31	2.229294
38	-9.3539	31	2.047539

```
CPU times: total: 16min 17s
Wall time: 1min 53s
```


Convergence of the expected energy

```
In [70]:   %%time

           # comment this out for challenge 2 and 3
```

```python
# Set up your QITEvolver for the graph with the tree edges removed
qit_evolver_H = QITEvolver(H_maxcut_H, ansatz_H)
qit_evolver_H.evolve(num_steps=40, lr=0.1, verbose=True)

# Visualize your results!
qit_evolver_H.plot_convergence()
```

step	curr_energy	num_circuits	quantum_exec_time
0	-3.9956	17	1.615039
1	-4.0392	17	1.352459
2	-3.7402	17	1.278062
3	-3.9479	17	1.194585
4	-3.8813	17	1.570516
5	-4.0066	17	1.270802
6	-3.9856	17	1.595384
7	-3.9930	17	2.098443
8	-4.0227	17	2.683584
9	-3.9400	17	2.427751
10	-3.9997	17	2.390881
11	-4.0149	17	2.082394
12	-4.1884	17	2.383293
13	-4.0204	17	2.364624
14	-4.0287	17	2.658038
15	-4.0333	17	2.297296
16	-3.9768	17	2.533927
17	-3.9896	17	2.256176
18	-3.8575	17	2.596043
19	-3.9846	17	2.499305
20	-3.8891	17	2.959942
21	-4.0958	17	1.817335
22	-3.9654	17	2.308488
23	-3.8661	17	2.062486
24	-3.9838	17	2.567088
25	-3.9063	17	2.327108
26	-4.0147	17	1.345574
27	-3.9146	17	1.440487
28	-3.9988	17	1.335268

step	curr_energy	num_circuits	quantum_exec_time
29	-3.9998	17	1.501457
30	-3.9729	17	1.234991
31	-3.9882	17	1.093015
32	-4.0132	17	1.276134
33	-4.0213	17	1.017460
34	-4.0495	17	1.321104
35	-3.9911	17	1.354049
36	-3.7540	17	1.403783
37	-4.1112	17	1.284779
38	-4.1415	17	1.312930

```
CPU times: total: 6min 1s
Wall time: 1min 38s
```


Convergence of the expected energy
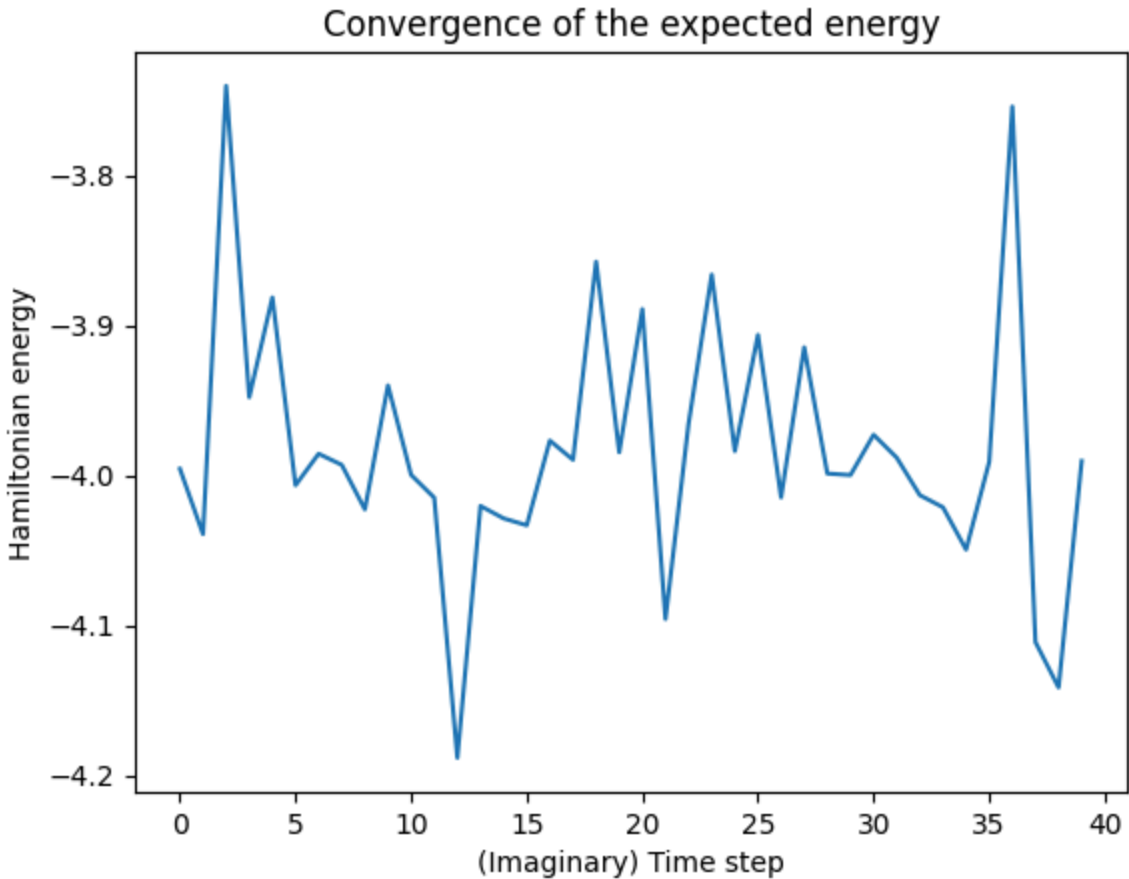
Check out your best / most frequent cut!

Following the variational quantum imaginary time evolution (vQITE) loop, we sample the quantum circuit to obtain classical bitstrings. The most frequent bitstring represents our solution, the final score though will take into account all of the right solutions...

In [71]:
```python
from qiskit_aer import AerSimulator

shots = 100_000
backend = AerSimulator()
```

In [72]:
```python
# comment this out for challenge 2 and 3

# Sample your optimized quantum state using Aer for the tree

optimized_state_T = ansatz_T.assign_parameters(qit_evolver_T.param_vals[-1])
optimized_state_T.measure_all()
counts_T = backend.run(optimized_state_T, shots=shots).result().get_counts()

# Find the sampled bitstring with the largest cut value
cut_vals_T = sorted(((bs, compute_cut_size(T, bs)) for bs in counts_T), key=lambda
best_bs_T = cut_vals_T[-1][0]

# Now find the most likely MaxCut solution as sampled from your optimized state
# We'll leave this part up to you!!!
most_likely_soln = ""

print(counts_T)
```

{'1111110000010111': 1, '0011100110111100': 255, '1111011111000001': 3, '0101000001010101': 18, '0010100010101000': 1, '1100110100010011': 171, '0011111000111000': 2, '1001100000101000': 5, '1100110000000011': 816, '0011111101011001': 1, '0101001101000101': 1, '1111010001011101': 8, '1011100010011000': 1, '1100110100100010': 14, '1100101110101010': 1, '0001001111111100': 80, '0010111000001011': 2, '0101010101000011': 102, '0011101110111101': 1, '1000111110000011': 21, '1010110010011001': 1, '1110001101000010': 2, '1100111110100010': 34, '0001101100011101': 1, '1000010101000011': 79, '0001101010001000': 4, '0011000011011100': 24, '1100000011010011': 1, '1000111000000111': 5, '1010111110111010': 1, '1111010111010101': 1, '0011110010001101': 13, '0110010101100011': 1, '1010000101111110': 62, '1110101010110110': 68, '1010100100001000': 3, '0001000111101100': 1, '1100010011010111': 78, '1110111111010111': 1, '1100001110110110': 9, '1010010101101011': 6, '0101000101000000': 1, '1000001111001000': 1, '0011010011111001': 1, '0011100100111100': 230, '0101101010110110': 71, '1010110110010110': 1, '1100111010000010': 4, '0011010001101001': 81, '0001101110001100': 1, '1010101111111010': 1, '0101010000000001': 4, '1100000001000011': 51, '0011101110111100': 860, '0111010101010101': 22, '0111011111011101': 18, '1011111010001001': 16, '0011010011011100': 2, '1100110000100010': 23, '1110011001000011': 19, '0011010001011101': 584, '0100011111000011': 33, '1000001111101110': 3, '1010101000101010': 31, '1111011001000101': 1, '1100110100010111': 929, '0101010001100000': 1, '1010101100111110': 23, '0011101110111000': 118, '0100001101110110': 2, '1100110010000010': 2, '1000100110100010': 7, '0101001001110000': 1, '0100110110110110': 2, '1100000010101111': 50, '0100010101000001': 3, '0001100011101000': 1, '1100111010010111': 345, '1111000101011101': 1, '0101001011010101': 3, '1010011111001110': 2, '0101101000010101': 6, '1010101010101010': 254, '1100110000010101': 12, '1010010001101001': 9, '1101100000000000': 2, '0001000101111100': 30, '1110110100000111': 17, '1010101110100010': 4, '0001100000011101': 3, '1110101000111100': 1, '0011100110101100': 32, '0101111100100011': 1, '1010100110011010': 1, '0011000101001101': 6, '1011000001101000': 59, '0011000101001110': 1, '1011000001101001': 2, '0010101010111000': 1, '1100110101010111': 19, '1110111110010011': 2, '0101111100100010': 1, '1100100010110110': 275, '0100100100100110': 7, '1010001111011100': 6, '1011001011101000': 118, '0001100110100010': 1, '0011011111111100': 59, '1110010101011111': 3, '1100101010100000': 3, '0111011011011101': 17, '1110011011111101': 2, '1100100000010101': 1, '1010111110101110': 5, '1100111000000111': 28, '0100000001110010': 1, '1010000101001010': 14, '0011110100011001': 118, '1110000010110110': 1, '0011100011111000': 3, '1100101110110110': 654, '1100111010000111': 72, '0111000101110110': 2, '1110000001100010': 28, '0100001110110110': 2, '0111001011011000': 1, '0001111110010101': 3, '1100010111000010': 1, '0011001111011110': 3, '0111001101111000': 1, '1011111010010101': 1, '0101001011000001': 9, '1100101010100110': 144, '1011100010001100': 1, '1111010011101000': 1, '0111010101001001': 56, '1010001111011110': 35, '0011101100101000': 101, '1100011011000011': 211, '0011011001001001': 190, '0101110001010101': 1, '0100010111010011': 5, '1010111110000011': 2, '1100001101010011': 3, '0101111100100001': 10, '0011111010111101': 35, '1010100110011100': 3, '0011101000011001': 1, '1100110000010111': 713, '0011011001011101': 151, '0101000101100000': 16, '1110101110111100': 7, '0011000101011101': 36, '1001111000001001': 3, '1100110010100110': 3, '0001010100000001': 1, '0011101010001100': 16, '1011001111001100': 2, '1000010111011111': 1, '0110001111101010': 1, '1100010101000011': 1104, '1001001111011100': 3, '1100011101010111': 270, '0100111010000111': 4, '1000010111110111': 1, '1010111101001001': 1, '0010101100001000': 1, '0001000001011101': 2, '0100111111000011': 2, '1010000111101010': 58, '1010101110100110': 2, '0111000011100010': 1, '1110110100000011': 117, '0011110010011001': 10, '1010011001011111': 12, '1000011111001011': 3, '0011111011001001': 4, '1001100000011101': 1, '0011111000001101': 31, '0011101010001000': 80, '1011100100101001': 1, '1011001111001000': 16, '1100110110100010': 3, '0101000011100100': 3, '1010100000101010': 130, '0011010011111100': 22, '0011100100111001': 2, '1000001111001011': 1, '1110110000010111': 72, '1011000101011101': 2, '1010111010011001': 9, '0101101110110110': 50, '1100101100110011': 1, '1101010101110101': 1, '0011011101011101': 209, '1100010101000101': 3, '0100100110110010': 2, '1100100000100010': 348, '1110111010000011': 25, '1110011011100011'

1': 2, '0011111000001001': 188, '1100101100100010': 86, '1100001111100110': 89, '000
0100100001000': 1, '0111110000001001': 42, '0010110000001011': 6, '010100101111010
0': 65, '0100000011100000': 1, '1010001111111110': 240, '1000000001110010': 2, '0011
111000101101': 1, '1101110000000001': 28, '1011111110101001': 5, '0111010000011101':
1, '0100000101000111': 4, '0100100100110110': 17, '1010110000001111': 5, '1100101010
000010': 52, '0011010011011001': 9, '0011010001111101': 62, '0111000001110100': 3,
'0101100000100101': 1, '1011000111111110': 2, '1010001111001010': 24, '0011000001111
000': 70, '0011101110101000': 693, '1100000011100010': 235, '0101000011000010': 4,
'1110101000101000': 1, '0101011011110111': 1, '0011111110011101': 360, '101010011010
1010': 63, '0011001111011101': 16, '1100010111000011': 92, '0010001011101010': 28,
'1010101111111110': 3, '1000000111000010': 2, '0011010101101000': 24, '0011001011111
100': 1032, '1010111110011101': 34, '1100101110010110': 87, '0101011001100001': 9,
'0101101010010011': 1, '1000100110011101': 1, '1100100110110100': 1, '00111101000111
01': 763, '0101111110000011': 31, '1011101110111000': 19, '0101110000010101': 181,
'0111011011001101': 1, '0011011111001001': 235, '1010011111001001': 14, '00110000010
01001': 34, '0011011101101101': 4, '1000001011101010': 15, '0011100000111000': 74,
'1110001011100110': 11, '0011000001011111': 1, '0011101110011101': 23, '001001100110
1011': 2, '0101100110110100': 18, '1000101010001010': 1, '0011101100111100': 71, '11
01101010110110': 10, '1110001001100010': 9, '1101001011100000': 7, '101011101001110
1': 26, '1111001111111000': 1, '0010010001011011': 2, '0111010111010111': 2, '001111
1100001101': 39, '1100001111100010': 581, '1100101100100110': 4, '1010001111111010':
35, '1000000001110110': 10, '1110010101000001': 3, '1011011111101001': 1, '110000100
1100010': 92, '0100101110001010': 1, '0101100010000000': 1, '0011101010101000': 898,
'1010000001101011': 1, '1001001011111000': 2, '1100101100010111': 12, '0111100100000
011': 1, '1000101110010110': 7, '0101001111011100': 1, '1110100000111110': 6, '11000
10111010111': 135, '1000011011001101': 1, '1000000001000111': 1, '1010011111001011':
7, '0101110100010011': 20, '0111111010110101': 3, '0011100000111100': 270, '11000000
11000010': 13, '0011010000011101': 5, '0101000011100010': 13, '0101110110110111': 1,
'0101100000000101': 3, '0111101100110000': 2, '0001011111110011': 1, '00011111100011
01': 6, '1011010001011101': 85, '1010011111111100': 4, '1100100110100110': 33, '0100
011101110111': 3, '0011001111011100': 107, '0011000001111110': 5, '001000111110110
0': 2, '0101101010100000': 64, '1110011111010101': 2, '1000100010100010': 13, '10110
00111111000': 3, '1001000001101000': 3, '1101011011010111': 1, '0100001011000110':
2, '1100011001110111': 25, '0011010001111001': 17, '0011010011011101': 88, '10011101
10111100': 2, '0000011111111110': 1, '0100000101000011': 5, '1010001011101000': 72,
'1000001110100010': 1, '0100100100110010': 9, '1010110000001011': 32, '0011100010101
100': 54, '1100010001010111': 773, '0010111010011001': 1, '1011000001001001': 6, '00
11111110001101': 41, '1000011111011101': 2, '0101000011010100': 1, '011100111111110
0': 65, '1011001111011100': 20, '0011100100101000': 348, '0110010111100010': 2, '101
0010001001110': 1, '1100000001110010': 43, '1010001011111110': 286, '110111011001010
1': 6, '1000011001010011': 4, '0101001011100011': 1, '1100000101100111': 1, '0001000
001111100': 30, '0101110000000001': 233, '0111100010011100': 1, '1011001111011000':
1, '0001111010000011': 1, '0011100100101100': 32, '1010101010111110': 274, '00010110
01001001': 15, '0101000001110010': 8, '1011111000011101': 14, '0011100010111100': 28
0, '0101101010110100': 61, '0000100100001010': 1, '1100101000000110': 1, '1101000111
100100': 1, '0011111100001001': 234, '1001001101011101': 1, '1010101110101110': 34,
'1011101110101000': 82, '0001000101110100': 2, '1011100110011100': 6, '1001100100000
001': 1, '1100110100110111': 70, '0001011011000011': 2, '0100110000010111': 80, '011
0101000100010': 2, '1100111110110110': 45, '1110001101110110': 3, '011110011010100
0': 14, '1100010001110011': 12, '1000011101010011': 2, '0011010001011001': 107, '101
0011001001011': 14, '0001010011001001': 5, '0100110001010111': 1, '010110001011011
0': 21, '1000001111110110': 54, '0011111000011101': 180, '1101010011010101': 2, '001
1111000111101': 22, '1101110000010101': 22, '1010100100101010': 90, '101011000001101
1': 7, '1001011011001001': 3, '0011101000111000': 26, '0011001001111000': 16, '11100
10101010011': 17, '1011011101011101': 24, '0001110110111100': 2, '1100001001010010':
2, '0011110010011100': 4, '1000100100110110': 13, '1101111110010011': 1, '1000000011

101010': 8, '0010001001101000': 4, '0011001011001000': 60, '1000101110101010': 14, '1011101100111001': 1, '0100011111010011': 8, '1100010101100010': 16, '1100111000010111': 208, '0000101000110110': 2, '0011001011101000': 924, '1100000110110110': 5, '0011101100011001': 3, '0110100000000011': 2, '0011100010001000': 24, '0111000111111100': 18, '0001111000011101': 19, '1100101010110110': 830, '0101011101010111': 17, '1000000001101010': 6, '1000110100000011': 65, '0001101010101000': 87, '0111110100110101': 4, '1011001011111100': 104, '1000011011001011': 1, '0011000001001101': 5, '1010011111001101': 7, '0011011101101001': 16, '0101110100010101': 254, '1000100000010110': 1, '0011100000111110': 6, '0111101010101100': 9, '0011110100001001': 825, '0100100000100110': 5, '0001100100010101': 2, '0101010001100001': 28, '0011111101011101': 4, '1010010101001011': 70, '1000110000011011': 1, '1100110100000011': 1082, '0011100010101000': 270, '0011011101001101': 29, '1100001010100110': 1, '1100010001000111': 118, '1000100010111100': 5, '1010100100011101': 4, '1101110100000001': 35, '0011110010101000': 17, '1100101000100010': 119, '0001111110011111': 1, '1011100001111100': 3, '1111101010001100': 1, '0110010101000011': 11, '0011000011111100': 307, '1111001111100010': 1, '1010011111110110': 1, '1000110101010111': 1, '0001111110000001': 7, '0001010001011101': 51, '0111000101111110': 2, '1000010101100011': 11, '1110000001101010': 9, '1011010101001101': 9, '1000111100000001': 1, '1010110010111110': 4, '1010111000011111': 8, '1100011011110110': 44, '0111110110000001': 1, '0011001100101000': 1, '0011010111001001': 63, '0111001101100000': 2, '1000011101000111': 2, '0011010001001001': 662, '1010011101001001': 18, '0011000011001001': 6, '0100011001000111': 7, '1100011111010111': 409, '1100100100010110': 21, '1110001111100010': 52, '1100110110010111': 120, '0100001011100010': 96, '0011101100011100': 5, '1000111100001001': 2, '1110010000010111': 1, '0101001111100100': 2, '0111011111010101': 5, '0111010101011101': 50, '1100100100000011': 60, '1100111010110101': 1, '1100111100010111': 256, '1110001111010111': 4, '0011000001101000': 442, '1010110100011111': 56, '0101010011110110': 3, '0011000011111000': 49, '1110101010001010': 3, '1100110101000010': 1, '1011000001111000': 13, '0001001000101000': 1, '1010000001011100': 1, '0110010001011111': 1, '0101101010100110': 13, '0010001111101110': 6, '1011111010001000': 1, '0011000001111100': 272, '1110011111010011': 2, '1011100011111100': 1, '1010010001010111': 4, '1100110000100011': 105, '1011100000101000': 42, '1100111100000011': 327, '0011001101101000': 108, '0101111000111101': 1, '1100000000000010': 1, '0011101000101010': 2, '0011100110011000': 6, '0111000111011100': 1, '0111100000101000': 38, '0101000001100010': 21, '1000100100101000': 2, '0101010101000001': 291, '1110011011101110': 1, '0011110100001111': 1, '1010001111101000': 63, '0011110000001001': 678, '1100010001010011': 144, '0010101111101010': 1, '0101001111010110': 8, '0101101000100010': 7, '1000101110011100': 1, '0011011101111001': 4, '0101110100000101': 40, '0001010001001001': 56, '0011100110001001': 3, '0011110000011101': 519, '0011111010101001': 29, '1100010000000011': 8, '1011010001010111': 1, '0001111110000111': 1, '0001011001011101': 19, '0111000101111100': 9, '1010000011011110': 8, '0001101110101010': 2, '1100001011110010': 125, '0011101000011000': 3, '0110011101010111': 2, '1100011011000111': 55, '0011001111101000': 668, '0101010101110010': 1, '1100100000010111': 53, '0011000000000100': 1, '1011100010101000': 33, '0111110000110101': 5, '1110001111010110': 8, '1111101110111000': 1, '1010010001011111': 49, '1110001011010111': 1, '1000100010101110': 1, '1110011111011011': 1, '0110010001010111': 10, '0011001111111100': 782, '0111100100110110': 2, '0111110000000001': 16, '0111101010001000': 6, '1010110100011101': 69, '1010010111011011': 1, '0010100000111100': 3, '1000110100010111': 51, '0001111010101001': 2, '1010101110001010': 27, '1101010111010101': 7, '1110011101010111': 27, '1000110110110110': 2, '1110101110100010': 47, '1100110011000111': 1, '1100111100101011': 1, '1101111110010101': 17, '1010011101101011': 3, '0011110100111101': 56, '1100100110100010': 161, '0001011001010011': 2, '1000010101101011': 1, '1110000001100000': 1, '0111000101110100': 1, '0011101010111100': 1084, '0001000010111000': 1, '1110010101011101': 3, '0011010101001001': 842, '1100101010100010': 734, '1010011111101100': 1, '1000110100001101': 1, '1000000001100110': 4, '0010110000001001': 8, '1000010100001001': 1, '0100010001100010': 2, '0101011001001001': 3, '0100000011000110': 1, '1000011111001010': 1, '1100000100110110': 5, '0111110110010111': 1, '1010110010011111':

8, '1100000011100011': 1, '0111001011110100': 8, '0101100100100001': 3, '1011111100 01001': 27, '0100001111010110': 10, '1110011011001001': 2, '1000010101010011': 9, '1 100101110000010': 74, '0011101010011100': 78, '0111100000111000': 5, '01010000011101 10': 18, '0011111100101001': 23, '0011100110001000': 34, '1110011111100011': 3, '011 1011111000011': 4, '1100010110010111': 1, '1011000111101000': 19, '0101010101010 1': 231, '0100100010110010': 3, '0001101110111100': 69, '1110101000110010': 3, '0001 110100110011': 1, '1110110100001111': 4, '1010101110101100': 11, '0011011111001000': 10, '0010010001001001': 4, '0010000101101110': 1, '1111111110010111': 1, '1010111110 001001': 17, '0101010101100010': 1, '0001011011010111': 1, '1110000011100110': 7, '0 011101010111000': 156, '0110101000001010': 1, '0001111110101101': 1, '10111100001010 01': 13, '0101100011110110': 1, '1010010001111010': 3, '0111010101100001': 1, '11100 01111000010': 2, '0100110010010111': 10, '1010001011101010': 272, '110001111111011 1': 27, '0001101010111000': 17, '0001110110011101': 10, '0111000101010111': 1, '1101 111000000001': 7, '1111000010101110': 1, '0011110010111101': 14, '0011101111101000': 11, '1101010101000101': 4, '1100001001110110': 76, '1000100100010010': 1, '011101011 1011101': 4, '0101011111000001': 64, '0100101110000010': 9, '0111101010110110': 6, '1000000001111110': 8, '1100001111010110': 84, '1110010101001011': 5, '1010001111110 010': 1, '0011111010001101': 55, '1101000111100000': 1, '0111110000001101': 6, '0111 100100111100': 16, '1100101000000010': 9, '0011011111011000': 1, '1110010011100010': 1, '0011100000011101': 40, '1000110100001011': 6, '1110101010000010': 6, '0111110100 000001': 25, '0101111000011001': 1, '1101101010100110': 3, '0011010010111100': 1, '1 100011111000111': 61, '1100111010110110': 54, '0001001111011000': 2, '10100100010111 01': 44, '1001111000011101': 2, '0100101100110010': 2, '0011000111101000': 246, '000 0101010110110': 6, '0011011001001101': 31, '1110000001111001': 1, '101011001000110 0': 1, '0101100100110100': 15, '0100010101000111': 19, '0110100000111110': 1, '11001 01100100011': 3, '1100001111100111': 1, '1010110010101010': 3, '1000100100011101': 1, '0011110110011101': 109, '0011100000011000': 4, '0000010001010111': 1, '001101111 1011101': 342, '1010011111101001': 1, '1001110000011001': 1, '0011000011101000': 24 4, '0000110100010111': 7, '0001001111101000': 72, '1110101100110110': 6, '1010101110 111010': 26, '1110100010100010': 17, '1100011001000001': 3, '1011110100011001': 1, '1111000111111100': 4, '1110011011010110': 1, '1001100000001000': 1, '11001100101101 11': 17, '1101011001000101': 1, '0110110000110011': 1, '0100100000110010': 8, '10100 01101001110': 1, '1010101010001100': 3, '0101011101100111': 1, '1010000001101000': 2 3, '0010100110101010': 7, '0111110000011101': 34, '0101111000000011': 23, '111000111 1111100': 2, '1000100110110110': 12, '0011100000001101': 7, '0011001110101000': 10, '0011001101111100': 61, '0001111010011001': 2, '0101111110000001': 87, '010111000001 0111': 53, '0011000010111100': 2, '1000100000100010': 19, '1110000001000011': 1, '10 11100000111100': 34, '0001100000110110': 2, '1010101110111100': 63, '110001100100001 1': 252, '0101010100010101': 4, '0000111010011101': 1, '1110110101000111': 1, '10000 01111010111': 1, '0100110000110110': 4, '1100111110000011': 292, '1011101110001000': 10, '0001111000011001': 4, '0111110100000101': 4, '1101101010100010': 12, '110001111 1000011': 321, '1010101000001011': 2, '0111011011101000': 6, '0001110010111110': 1, '1000011011001000': 1, '1001010001001101': 1, '1010000001111010': 24, '0001001011001 010': 1, '0011001011101110': 2, '1011001001001001': 3, '0010001011001000': 1, '11100 10101100001': 1, '0011001001101000': 141, '1000101110110110': 46, '001101101101100 1': 22, '0111110010001101': 3, '0111101110100110': 1, '0011010101001011': 8, '000110 1110100000': 4, '1010100100111110': 63, '1110101100111110': 2, '0111000011110110': 2, '1100111110010101': 8, '1110100010101010': 12, '0011011011111101': 40, '111010100 0000011': 2, '0100010001100011': 10, '0101010011000111': 1, '1011110100101001': 8, '1110100100101010': 8, '0000011101010011': 1, '1100001011000011': 19, '1010100010101 000': 20, '1100111000010011': 37, '0100011111010111': 65, '1010011101111110': 1, '10 00001101110110': 2, '0101100000110110': 18, '1100010101010111': 903, '11000010110100 11': 3, '0011001011011100': 87, '0101010001000111': 8, '0101110110000011': 10, '1011 110100011001': 12, '1101011011100001': 1, '0011010111101000': 8, '0100001101010111': 3, '0101100110100110': 3, '1000001011100110': 10, '0111111010111001': 2, '1110001011 101010': 7, '1011110110001001': 9, '0011010000101000': 1, '1110111010100010': 4, '01

'010111101010011': 3, '1100101010110010': 120, '0011111100011101': 188, '1110111110111110': 1, '0001100000111000': 11, '0100010001110011': 4, '1110100010010110': 1, '1110110010010101': 1, '0000011101000011': 1, '0010001001111100': 1, '0011001010111100': 14, '0100110100110111': 11, '0011000101101000': 342, '0111001001001001': 2, '0100101100010111': 1, '0011001001101100': 10, '1100101110100010': 570, '0001001111110000': 1, '0101000001100000': 30, '1100101010111100': 1, '1010000101011101': 4, '0011101000101100': 17, '1000100000000001': 1, '0011111010000001': 3, '0011110001011101': 8, '0111101010111100': 69, '1110010101000111': 17, '1011101100001001': 5, '0010010001011101': 2, '0011111100001011': 3, '0101001011110110': 64, '0100000011100010': 30, '1010001101111000': 1, '0011110010111100': 21, '1101111111010111': 1, '1010100010101010': 70, '0111001011111100': 74, '0001100110001000': 3, '1100010001100001': 1, '1011110000011101': 73, '1100101010010100': 1, '0111101110101100': 6, '1100001011110110': 843, '0001000011011101': 1, '1000110110000111': 1, '0100101110100010': 62, '1110110100000001': 2, '0100000101110110': 25, '0111000011100000': 2, '1110101000111110': 2, '0100100100100001': 1, '0001110100111101': 5, '0011000101001011': 1, '1100001101010111': 18, '1000110010001001': 1, '0100010111010111': 16, '1100101010010101': 1, '1011001001111100': 8, '1100001011110111': 2, '1010011001011101': 13, '1101011011000001': 5, '1100110000010011': 163, '0101000111110110': 13, '0001011101010101': 5, '0010001111111110': 36, '1010100010011100': 3, '1011010101111001': 2, '0010101000111010': 1, '0100110100000011': 118, '1011101110011100': 12, '1011100010111000': 4, '1000000001111010': 2, '0111101010110010': 1, '1100001111010010': 16, '0011010111011101': 117, '1010001111110110': 1, '0101011111000101': 16, '0011001111111000': 137, '1010000111001010': 4, '1100000101100000': 2, '0101001011100100': 12, '0100011101100011': 4, '1010010001001001': 53, '1101011111010101': 14, '0101010100000101': 1, '0111000011110100': 1, '1000001111100011': 1, '1110100100010110': 4, '1100111110010111': 424, '0110011111000011': 4, '0101010011000101': 6, '1010010011001001': 7, '1100011001010011': 34, '1110100010110110': 21, '0001011011001001': 20, '1010011111101101': 1, '1001110000011101': 5, '1000101010101010': 24, '0101110100110101': 19, '0011100000011110': 1, '0011110110011001': 13, '1010111100001011': 21, '1000100000110010': 3, '1110010011100011': 1, '0011011111011001': 38, '1011101110001100': 3, '1101001011000100': 1, '0100111100100011': 5, '0101000011110110': 20, '0011110110001001': 66, '0001111110111100': 4, '0011011111101001': 14, '1000010101111110': 1, '0100111110000011': 41, '0010011011101011': 1, '0010101110001010': 5, '1100000011110110': 246, '1010000101111100': 18, '0111001011101000': 63, '1110000001110110': 25, '0011010001000001': 2, '0111001101101000': 8, '1111101010101000': 6, '0100111000100011': 4, '0111101100011101': 2, '0011000110011100': 1, '1010000011111110': 76, '0101111010010101': 101, '1011010001101000': 5, '0101011011010101': 83, '1100100010010110': 25, '1100001011010111': 18, '0010000111111110': 8, '0101010001000011': 63, '0001001010111100': 1, '1100011001100101': 1, '0100010000010111': 2, '1010011101111001': 2, '1111110000100000': 1, '1010010101001001': 54, '0101001101000011': 1, '1100000001000010': 22, '0001001111111110': 2, '0101010101000101': 49, '0011110110111000': 2, '0011100100101010': 9, '0001111010000001': 1, '1010010101011011': 8, '0111101110001101': 1, '1000011011110111': 3, '1111011001101001': 1, '0101110000000011': 49, '1100000011100110': 33, '0001100010101000': 24, '0011000011011001': 1, '0011000111011000': 6, '1100111110110101': 1, '0100110100010011': 16, '0011011101111100': 2, '0111110000010001': 2, '1110001111110110': 44, '1100111100110110': 6, '1100110110000011': 79, '1010111010101100': 1, '1100100010100000': 1, '1110000101100010': 24, '1001000101011100': 1, '1101111100000101': 1, '0100010101110111': 5, '1010011011011111': 9, '1011000001101100': 2, '1100001111110111': 2, '1111111110011101': 4, '0011100110101000': 202, '0001110101001001': 2, '0101011011110001': 3, '0111001111101100': 6, '1001010101011101': 9, '0011010110111100': 1, '1000011011010011': 4, '1011010111101001': 2, '1101010111000101': 2, '1010101000111110': 31, '0011011001111000': 1, '1111110000011101': 4, '1011101010111100': 116, '1110100100010111': 7, '1000001111100010': 36, '0101100010100010': 14, '1100111110010110': 3, '1011001111111110': 1, '1000010111001111': 1, '0001110000101001': 8, '1000001011011110': 2, '0100110010110010': 1, '1010100110111100': 21, '1001010101000001': 1, '1110100110100010': 17, '0011100010111000': 43, '1101000001110110': 1, '0111001111000010':

1, '0111110100111001': 1, '0001000001100000': 2, '0101011111010101': 116, '000011011 0000111': 1, '1100010011100011': 10, '0101111010110001': 2, '0111000111101100': 3, '1000111010001001': 1, '1100100000110100': 3, '1000110000000111': 3, '10000000101010 10': 1, '0111001111111000': 5, '0101100000000001': 15, '1100000011000110': 3, '01010 00011100110': 4, '0001110110001001': 12, '1001001111111000': 2, '1011101100111100': 8, '1000010001010101': 2, '1110111101000011': 1, '1000110000011111': 4, '11001101000 00111': 151, '1100010001000011': 826, '1100001010100010': 3, '1011001101111000': 4, '1100000001110100': 3, '0100011011000011': 32, '1101110010100001': 1, '1100100010010 111': 7, '0111101100101000': 6, '1001010101000111': 1, '1010100110111110': 60, '0101 110110100101': 2, '0110011101111110': 1, '0010001011011010': 1, '1101010001000001': 30, '1010110100111100': 2, '0101000111100000': 13, '1100001111110110': 667, '0010101 010111100': 4, '0111111110001101': 2, '1010011101000011': 1, '1001101010100110': 1, '1010100010111111': 1, '0001011101101001': 2, '1100011011100111': 11, '1101100100000 110': 1, '1110001111101000': 4, '1101010001100101': 1, '0001101010111100': 101, '001 0001011111110': 27, '0111111100110101': 1, '1011111010001101': 4, '010110000010001 0': 27, '0011100000101000': 457, '1000001101100010': 6, '1101110100000011': 6, '0011 010001111100': 24, '1010101000001010': 3, '1100100100000111': 11, '100000010110100 0': 2, '0101001111100000': 35, '0001100010001000': 3, '1100111100010011': 40, '11100 01011010010': 2, '0101110010110101': 2, '0001100110111100': 21, '0011010101011101': 718, '0101110001110101': 1, '1100011011010111': 356, '1100101110000110': 14, '100001 0101010111': 66, '0011000011011000': 1, '0001101010001100': 2, '0001010001101101': 2, '1010000011111000': 3, '1110111000000011': 17, '1110101100100010': 7, '0101011011 110010': 2, '0101111110111101': 1, '1010110110010111': 1, '0101101010110111': 1, '11 00111010000011': 223, '1011001001011101': 2, '1101101011110100': 1, '010111101000000 1': 57, '0011010001101000': 21, '0101011011100001': 14, '0010101110101000': 6, '0010 100110101000': 3, '1010000001101010': 109, '0010010111001111': 1, '001111111000110 0': 1, '0101100100010001': 6, '1100100110110110': 208, '0011110100011111': 9, '00011 00000101000': 37, '0100010001000001': 4, '1000101110101000': 4, '0011011011101001': 19, '1010101010100010': 8, '0011111010011101': 260, '0011101110001000': 94, '1100101 011100110': 3, '1010000001000010': 1, '0101011101000001': 87, '1100011111010011': 5 4, '1100100100010010': 6, '0100011001000011': 23, '0001010001111001': 2, '0110111100 000011': 2, '1111110100000001': 3, '1011111110011101': 36, '0011011010101000': 2, '0 001010111000001': 2, '1110101010010111': 2, '0111111010100001': 1, '010000101111011 0': 114, '1110100000010010': 4, '1110110000010001': 1, '0010101110111110': 20, '0010 110100011111': 11, '1100000011010110': 13, '0101110000100001': 24, '111010111110111 0': 1, '1011111110001100': 1, '1010011011101010': 16, '0101110110010101': 37, '00110 01011001100': 13, '0011110100111001': 10, '0010000111101010': 3, '0011000111111110': 4, '0111100000100000': 3, '1100101000110110': 58, '1010000011001010': 4, '0011100111 101000': 2, '0100100000000111': 3, '0101011001010001': 7, '1100010011000111': 12, '1 000001101111110': 2, '1010001001111100': 6, '0110100010100010': 4, '011110100001100 0': 1, '1010011101101010': 2, '0101110000000101': 38, '1010010101011101': 49, '01111 11100111101': 2, '1011001111101000': 90, '1011100110001001': 1, '0011001011001101': 1, '0011000010101000': 3, '0000111110101110': 1, '1011100000001000': 2, '00011111000 00111': 1, '0101100010111100': 3, '1000001111111100': 2, '1100001011100010': 732, '1 100010010000011': 1, '1110111110000011': 16, '1100001101100010': 84, '01110100010111 01': 37, '0001111010101100': 1, '0011001101001000': 15, '0101010111110110': 2, '0111 111000001001': 14, '0101101000110010': 2, '1110101010000011': 3, '1100110001000111': 2, '0010101010101110': 3, '0101110100001001': 2, '1000101010001100': 1, '10000010111 10110': 50, '0101100110110110': 20, '1011011011101001': 4, '1000000101110010': 2, '0 011000001011101': 30, '0111011111001001': 12, '0101001011100000': 52, '1000000111111 110': 3, '1110110000001011': 6, '1000011011110110': 5, '0101110100000011': 74, '1000 101110011110': 3, '1000000001010111': 3, '1010101110011110': 33, '0110111110000011': 1, '0000000101100010': 1, '0011001011101100': 171, '0000001011111110': 8, '010101111 1110101': 6, '0111110010001001': 3, '1010001011010110': 1, '0011011011011101': 263, '1110101010001000': 2, '0000000111100010': 2, '0001111000010111': 1, '01111000101010 00': 20, '0011111100111101': 17, '1001011001101001': 1, '1101011001010111': 2, '1100

011011110111': 46, '1000101011100010': 1, '1000111110111101': 1, '0101101110100010':
45, '1011100100011000': 2, '0000101100111110': 2, '1011110000001001': 86, '011111101
0111100': 2, '0001011111001101': 8, '0011111010011111': 1, '0111101010010110': 1, '1
100010111100010': 6, '1011011111011101': 38, '1111110101011101': 1, '001111011001110
0': 2, '0011011111011100': 12, '1011000100101000': 1, '1000110100001001': 6, '011101
0111010101': 4, '0010110000001101': 1, '0111100100111000': 4, '1000101110000111': 1,
'1100001111100000': 2, '0101001011110010': 4, '0100000011100110': 3, '11000001010101
10': 22, '1110010101000011': 105, '1010001111111100': 57, '1010011111011001': 5, '10
01110000001001': 6, '1100000101000001': 1, '0011111010001010': 1, '010001010101001
1': 27, '1111001001101100': 1, '1010111100101000': 1, '1010000001111110': 81, '01111
101100011001': 11, '1110001111111010': 1, '0101111000000001': 69, '1100011001100111':
2, '0011110100101001': 74, '0011001011011110': 1, '0101010001000001': 202, '10001110
10101110': 1, '1100010111010011': 12, '0101111101010101': 1, '1011011011101101': 1,
'0011000001011001': 5, '0100111010000011': 31, '1100011101010011': 47, '010001101110
0011': 3, '0001010101010111': 7, '1100011101000011': 290, '0100111010010011': 1, '11
00000001100010': 364, '0100011011010011': 2, '1010010101111111': 5, '110100101101011
1': 1, '1110101010111010': 3, '0100100000110110': 26, '1101011001000001': 4, '101111
0100001001': 93, '0011000011101010': 7, '0010011011111110': 2, '1110110110000011':
6, '1100100110010111': 8, '0101010101010001': 36, '0111100000011100': 1, '1010000011
101010': 74, '0110111000110111': 1, '0111101100111100': 4, '1010011101011011': 6, '0
011000111111100': 246, '0111110000100110': 1, '0110001011100010': 7, '00111111000110
01': 49, '0000111100010111': 3, '1100011101010001': 1, '0100111010000001': 1, '01000
11011100001': 1, '0001010101010101': 15, '1010011111011101': 29, '1001110000001101':
3, '0101100110000010': 2, '0101001111110110': 50, '1010111100011111': 19, '010111010
0100001': 20, '0011011101010101': 1, '0011100110100000': 1, '1010101110101010': 172,
'0011011011011000': 1, '0010000001001010': 1, '1100110100110011': 11, '1010100100111
101': 1, '0100110000010011': 19, '1000100001001101': 1, '0101011001000001': 68, '001
0100010101010': 9, '0101110100000001': 300, '1100101100010010': 2, '011111101000111 0
1': 57, '0110100000010111': 3, '0101000001110100': 20, '0011100010111110': 5, '10001
01000110010': 4, '0110001111100010': 11, '1100110100100011': 74, '0011101110111110':
22, '1110010101101000': 1, '0100110000000011': 103, '1100010001110111': 88, '0111001
011101100': 8, '1010000101111000': 5, '1110001101110010': 4, '1100111110110010': 6,
'1000011101010111': 12, '1010011001001111': 2, '0110011001000011': 3, '1100101110000
000': 2, '1000100111101110': 1, '0011110010001001': 51, '1100011010110111': 2, '1101
000101010100': 1, '1000011111100010': 2, '1011100000101100': 6, '0111111000011101':
10, '0100000001110110': 27, '1010100010110110': 1, '1100111000000011': 239, '1010111
110101010': 14, '0101101100101000': 1, '0101010111010101': 38, '0010011101001011':
2, '0101111100110111': 1, '0011111110101100': 7, '0011001011110110': 3, '00111001000
11101': 47, '1110110100010011': 21, '1010010001111001': 1, '0101110010011101': 1, '0
011011011001001': 183, '1010111010011111': 23, '1101001011100010': 9, '0001011011010
101': 11, '0111001101111100': 2, '0101010101100000': 1, '1000010001110111': 4, '1100
111110010010': 1, '0101100010100110': 6, '1000001111100110': 7, '0010111010011111':
1, '0011011011111100': 71, '0111110010011101': 7, '0101001111100010': 43, '101000011
1011110': 15, '1100110110000010': 1, '0001001011111000': 13, '0101111100010101': 67,
'0001111100000101': 1, '1000001111111010': 1, '0001100100101000': 26, '0111100110011
100': 1, '1101111001000101': 1, '0011010101001101': 129, '0111101110100000': 6, '111
0010101011001': 1, '0100101010100010': 97, '0011010011001101': 8, '1110101000110 11
1': 1, '1010101100001001': 1, '0100010001010111': 74, '0100100000110111': 1, '001100
1101011100': 9, '1010111100111101': 2, '1110100000110010': 4, '0100001011010110': 8,
'1000000001010011': 1, '0101101000100000': 8, '0111100100001101': 1, '10000010111110
00': 2, '0101110100000111': 9, '1100111011000011': 4, '1110000101010011': 1, '001100
1111101100': 135, '1010011010011101': 1, '1100011101110110': 4, '1111100100101000':
2, '1110011101100111': 1, '0011101011111100': 8, '0101111110010101': 123, '000010110
0101010': 1, '0011111010101000': 47, '1001110000100001': 1, '0100000011110010': 2,
'0101001011100110': 10, '1100000101100010': 262, '1010010101011110': 1, '10000001111
11100': 1, '0111101110001100': 1, '1110100000101010': 9, '0000001101000011': 1, '111

'0101010110010': 12, '0101011111100001': 8, '1100010011010011': 13, '000100100110100 0': 18, '0010011011001011': 1, '1010101000111000': 1, '0101100100000101': 4, '001010 0100111010': 3, '0100001111110110': 74, '0101101010000101': 1, '1111110000011001': 2, '1000010001000011': 54, '0011101100101001': 2, '1000110010000011': 2, '0010000101 101010': 10, '1000001001100010': 8, '0101100100100010': 22, '1101001001100110': 1, '1010011011101000': 5, '0001101100011000': 1, '0000001111111110': 3, '01111010001010 00': 8, '0011101000111100': 89, '0110100001100010': 1, '0100011011010101': 1, '11101 01010100010': 71, '1011101000011100': 2, '1011001101101000': 13, '1010110000101001': 9, '0100111010010101': 2, '1100011101000101': 4, '0011110000111101': 76, '0100010011 010111': 15, '1011111000001101': 5, '0001001111011100': 11, '0110111000010111': 1, '0101011001110101': 5, '0000110100000011': 10, '0111011011000011': 1, '0011010111111 100': 18, '1100111010100010': 44, '1010010001111100': 3, '0100000101010111': 5, '101 0101011101000': 1, '1100011111110101': 2, '1010001011101100': 12, '000001010100101 1': 1, '1010110000001001': 57, '0001011101000001': 3, '1001100110011101': 1, '011110 0010110110': 3, '0011111110101001': 16, '1111011111011101': 2, '1101101010110010': 1, '0111100100001001': 1, '1000001011111110': 27, '1100111100110011': 5, '0101010001 010101': 194, '1100010111110101': 1, '1011010101001001': 94, '1110011001000111': 4, '1100110000100110': 3, '0011110010101100': 5, '0011100000101010': 14, '1110001011011 100': 1, '0100011010010111': 1, '1000101010111110': 23, '0011010101010101': 1, '1010 101010111100': 74, '0101010001100011': 12, '0101111011110110': 1, '001000010101111 1': 1, '0011110000001101': 88, '1000100010000010': 1, '0001001101111100': 5, '101000 1111101110': 33, '1110101110110110': 39, '0010111110001001': 4, '1000011111100110': 2, '0110011101000011': 3, '0011000101111100': 221, '1101001011110110': 8, '011110111 0111100': 43, '0011010001111000': 4, '1110000101001011': 1, '0100001011000111': 1, '1100011001110110': 8, '1100110000100111': 14, '0011010011011111': 2, '1110001111011 100': 1, '1101011011010101': 17, '1110011111010111': 35, '1011000101111110': 1, '001 0001111101010': 21, '0101101010100010': 51, '0001111101011101': 1, '000100001111110 0': 32, '0101101010111000': 2, '1100000101100110': 27, '0101001011100010': 53, '0100 000011110110': 37, '1010111010001011': 17, '0000010111010111': 1, '001110101010110 0': 155, '0100011101000011': 42, '1100010111110010': 1, '0100100111100010': 1, '1100 010101010011': 172, '0010010111011101': 2, '1000101110100010': 41, '001011011001111 1': 2, '0101011011110100': 2, '1000000011111010': 1, '0100101110010110': 10, '011101 1111110101': 1, '0011100100001001': 61, '1110010001010111': 79, '0101001101100010': 8, '1011111100001101': 6, '1011101010101000': 89, '0101000001000011': 3, '1010111110 011011': 6, '1011001011011101': 1, '0011001011111110': 27, '0110100100101010': 1, '1 011001111111100': 78, '0100110001000011': 1, '0101100010100100': 4, '111001100110001 1': 2, '1011101010111110': 2, '0110011001000011': 1, '0011100110110110': 1, '0111010 001001001': 47, '1011000001001101': 2, '0011111110001001': 222, '0001100100001000': 10, '1000100100000010': 2, '1000001011101110': 2, '1110001011100010': 59, '101100101 1001001': 3, '0011100100111010': 2, '1110101010101010': 15, '1110000101101000': 3, '1101100110100000': 2, '0011111111111100': 1, '1011110100001101': 10, '0100111100010 111': 31, '0011010101011001': 129, '0101101110100000': 38, '0001111110101000': 3, '1 011101100111000': 1, '1100010101100011': 72, '1001001111111100': 10, '00110100010011 01': 109, '0011111010001000': 10, '0101101110111100': 7, '1110010011010111': 4, '010 1001111110010': 8, '1100010101110111': 74, '1100100000110110': 233, '010110010011011 0': 11, '1000001001110110': 5, '1010110010001010': 1, '1101001001110010': 1, '000111 0000001001': 64, '1010100100101110': 10, '1010110000011111': 40, '0100101000010111': 2, '0011010101111101': 49, '1110010111001111': 1, '1110110100101000': 1, '1100001111 000010': 74, '1100010101000111': 164, '1010100010001000': 3, '1100101110100111': 2, '0111010011110100': 1, '1101110100100001': 2, '1110001101110111': 1, '00101011101110 00': 1, '1100010001110010': 1, '1100111110110111': 38, '0111010001011001': 5, '00111 01110101100': 120, '0001100100110100': 1, '0000010001001011': 1, '1000000111100010': 11, '1000100110101010': 6, '0100010001000011': 108, '0010000011111010': 2, '11101111 10100011': 2, '0001101110011100': 13, '0101000101110110': 10, '0111101000110100': 1, '1100110101010011': 2, '0011111010111100': 62, '1110111110010111': 31, '101101011111 1101': 1, '1110011001010011': 4, '1011010101011001': 27, '0011010101000101': 1, '111

0010111010111': 7, '0001000010110100': 1, '0011001001111100': 69, '110010101001011
0': 71, '1100001011110100': 5, '1100001011010110': 61, '1000011111010111': 32, '1010
110110111110': 1, '1100010011110111': 19, '1011000011011001': 1, '0001011101011101':
21, '1000100010110110': 16, '0011000111111000': 30, '1100101010110100': 1, '01010111
01010101': 69, '0011111100011011': 1, '0001100000110000': 1, '1110101100110010': 3,
'1010101110111110': 227, '1110110100100011': 8, '1010010001111101': 6, '010010010000
0011': 6, '0011011011001101': 39, '1110111100001001': 3, '1010001100111110': 1, '000
1110100011101': 58, '0100011111110010': 1, '0111111110010111': 3, '110001010000001
1': 7, '0110001001000011': 1, '1101111000010101': 10, '1110000011100011': 1, '010101
0101100111': 1, '0001101110110100': 2, '0011001111011001': 3, '0001010101000001': 1
6, '1000100000001001': 1, '0101011100000001': 1, '0011111010001001': 163, '010111110
0000101': 10, '0101110010010011': 1, '1110110100101001': 1, '0101000101010001': 3,
'1100001111000011': 20, '0001101110110010': 1, '0101010101100001': 27, '010010101011
0110': 94, '0111101110100100': 1, '0100101010100110': 14, '1100100100000110': 3, '01
10110100010111': 9, '1100011111000001': 7, '0001110100001001': 67, '000100000110100
0': 57, '1110101010101000': 4, '1110000101101010': 6, '1010110000100011': 1, '101000
1110001010': 1, '0011100100111000': 45, '0111011101000011': 1, '1110100000101000':
1, '1010010001001011': 47, '0001110010001001': 6, '0001101110000000': 1, '1010111010
111111': 1, '0010010101011011': 1, '1110100110110110': 15, '0101111101100001': 1, '1
000111010111010': 1, '0111111100010111': 5, '1010110110001101': 1, '101101110110110
1': 1, '0111010001010001': 5, '0011001011011101': 20, '1000101011111110': 1, '010100
1111110100': 54, '1010011111011111': 31, '1010111100011101': 18, '0101110100100011':
6, '0101101000000000': 1, '1100110010010111': 90, '0001001011011000': 2, '0101011011
000001': 53, '1010111000001011': 11, '0001110000001101': 8, '0100010101100001': 1,
'1101111100010111': 3, '0011111000001011': 1, '1001111000001101': 1, '01001111101001
11': 1, '0011000101011001': 13, '1011101100011101': 2, '0011101110011100': 109, '111
0001111111110': 16, '0101111000000101': 6, '1011100100101000': 29, '101100111100100
1': 2, '0011101010001001': 12, '1110000001100001': 1, '0001110000010111': 2, '001110
1010111110': 22, '1000010101110111': 7, '0001111110101001': 3, '0111111110110010':
1, '0100010101010111': 122, '1100001111010111': 24, '0001011111000001': 3, '00000001
01110110': 2, '0111101010011100': 7, '1010101010101110': 48, '1010111000011101': 16,
'1000111100000011': 20, '1000000101100110': 1, '1111001011100110': 1, '0111110100001
000': 1, '0000101010011110': 1, '0111111000000001': 9, '1100100000110010': 53, '1100
010101110011': 10, '0101001101110110': 3, '1100000001010101': 1, '1010010001101111':
1, '0011101000011101': 10, '0011110100001011': 4, '0111101010101000': 64, '111001101
1101010': 3, '0110001011101110': 2, '1101010111110101': 1, '0111100000101010': 2, '0
011101000101000': 125, '1111010101101101': 1, '1000010001011111': 4, '00010001011010
10': 2, '0100100010100010': 25, '1011111100001001': 24, '0001000101011101': 7, '1010
010011000011': 1, '0001110100100001': 3, '0110011001010111': 2, '1000011101000011':
21, '1100010001100011': 87, '1011111010111001': 1, '0110101110110110': 5, '001110100
0111101': 4, '0101101100100110': 2, '0011001011111000': 118, '1111101010100010': 2,
'0111001101100010': 1, '0001010001111101': 8, '0111101110000000': 1, '10101000001110
10': 16, '0111011101001001': 21, '1110100000100010': 23, '1110110000000111': 14, '00
01101010010010': 1, '1000110110000011': 8, '0010011111011111': 4, '010010111010011
0': 13, '0111111100011001': 2, '1100100001100010': 3, '0101010001110100': 2, '110010
1010000110': 16, '1100110000000111': 115, '1001011101111100': 1, '1000111110010111':
19, '0111001011010001': 1, '0010111110111000': 1, '0101010101010111': 68, '101010111
0110110': 2, '0111000011110010': 1, '0001100000111100': 28, '1101110110010011': 1,
'0111010111001001': 8, '1010001011111100': 89, '1100011011100011': 26, '100110111011
1000': 1, '0011001111001000': 90, '1010000101101000': 29, '1100011001110010': 3, '01
11110110111100': 1, '0011110000011001': 106, '1011011101101000': 1, '111101110101010
1': 2, '1100000101110010': 38, '1111100110101000': 3, '0110010001001011': 1, '001110
1110001100': 6, '1100100100100010': 263, '1001001011101000': 6, '0101010011010101':
32, '1001101010001000': 2, '0011111110000101': 1, '0001110000101101': 3, '1100001010
000010': 2, '1000100000100111': 1, '0001011111010101': 13, '1010011101011111': 13,
'0011010101101001': 69, '1100010101010101': 23, '0101100000110100': 16, '01110010110

01000': 5, '0011010010011101': 1, '1110110010010111': 22, '1100110111010111': 2, '1100010001000001': 20, '0110101000110010': 1, '1111111000011001': 1, '1010110100101000': 1, '1101010001010111': 5, '0011000111101100': 41, '0001001001111100': 5, '1011000011101000': 32, '1011010101111100': 1, '1100101110110000': 1, '1100000111100010': 161, '1010000101101110': 7, '1011001101001010': 1, '0011101110011000': 19, '0011100000001001': 33, '0111110000011001': 7, '0101111010011101': 1, '1011101110111100': 97, '1011110110111110': 1, '0111111100010101': 3, '0110010001110110': 2, '1110001011110110': 82, '1010011111001000': 1, '0001110010111100': 3, '0011000001001000': 42, '0111110000101001': 7, '0100110110100010': 1, '0010100000101010': 11, '1010001011111010': 41, '1110001001000011': 3, '1100010101100111': 10, '1111111100001001': 3, '0011111011101000': 1, '0101000101110100': 14, '1100110010000011': 60, '1010100110101000': 27, '0011001111101010': 12, '0111000101011100': 4, '1100111100000111': 40, '1101110010100011': 1, '0001010101111101': 7, '1001010101000101': 1, '0100110010110110': 2, '0010001011011100': 1, '1000000101011110': 4, '1101010001000011': 9, '0101000111100010': 10, '1010110100111010': 3, '0101101111000110': 1, '1010110110001001': 5, '0101110000010001': 32, '0101011011000011': 20, '1010010001101010': 5, '0011101000011100': 2, '1100000001010010': 2, '1011010101011101': 77, '1110011001010111': 23, '0011010101000001': 2, '1110010111010011': 2, '1100101010010010': 9, '1011111010011001': 10, '0001101110101100': 12, '1010100100110110': 1, '0001100110101000': 14, '0100001010100011': 135, '1100000101010101': 2, '1101101110010111': 3, '1100011111100111': 3, '1001111110011101': 5, '0100011001010111': 21, '0001010101001001': 67, '1000111110110111': 3, '1000001010010110': 1, '0011001001001000': 6, '0010110100111101': 3, '0011001111001100': 17, '1001101110111100': 6, '1000110000101001': 3, '0010010101101010': 1, '0001011110000001': 1, '1011001101001000': 1, '0011000001011100': 28, '0101010011000001': 14, '1110100010110010': 2, '1100011001010111': 204, '0011010011001001': 42, '0100000101100010': 43, '0011011110101000': 1, '0111011101011001': 2, '1110110000010011': 10, '0100100010110110': 31, '1101000001010101': 1, '0001101010101100': 11, '1011001011111000': 25, '1100001110110010': 1, '1010010101101111': 3, '1001001101101000': 1, '0101111000010001': 15, '1011000001111100': 26, '0001111000010101': 3, '0111110100001001': 54, '0100010001010101': 4, '1000101110110010': 7, '1001010001001001': 12, '1010111100101010': 3, '0001011111000011': 1, '0011011000001001': 7, '0101110110000001': 23, '1110101110101000': 2, '1100011001100011': 24, '0010000111111100': 1, '1110010111110110': 2, '0101010001000101': 38, '1110110010100011': 1, '0111011111101001': 1, '1010100010111010': 12, '1100101111100010': 6, '0001110100000101': 2, '1100000111110000': 1, '1010011001111111': 2, '0110101110000110': 1, '0001110100010101': 20, '1111101100111000': 1, '1110000011101010': 4, '1100010000010111': 7, '1101011101010101': 6, '0101010100010001': 2, '1110100100100000': 1, '1110110101000011': 1, '1100111110000111': 58, '0010000001111100': 5, '1110101000001011': 1, '0101000001010100': 2, '1001011111001001': 2, '0000111110010111': 2, '0010100110111110': 4, '0011100110111000': 37, '1000010100000011': 1, '1001111100011101': 2, '0101011001000011': 17, '1000000001000011': 2, '0101110100010111': 63, '0101101110000011': 1, '1111001111101000': 4, '0100011111110111': 1, '1101011101000001': 13, '0001011001000111': 1, '1110000001010110': 2, '0111110110110101': 1, '0011101100001001': 15, '0111100000110010': 1, '0011101010011000': 7, '1101011101010111': 5, '1011010001001001': 67, '0001111111001100': 6, '1010000001011111': 1, '0011111100111000': 2, '0100101110110110': 84, '0011011111001011': 2, '0011011001101000': 9, '1110010001110111': 7, '0001010001011001': 7, '1110111100010111': 19, '0011001101001001': 17, '0101010111110111': 4, '0110000111010110': 1, '0010101000101000': 1, '1100010101000001': 24, '0100100110110110': 12, '1100100000100110': 42, '1111110100010101': 2, '1110011011001101': 1, '1100110110110111': 11, '1010111110111100': 7, '1110000001110010': 7, '0111100110101100': 3, '0110001011110010': 5, '1111000001100000': 1, '1010011001001001': 13, '0111010001101101': 3, '1010100110001010': 9, '1010111110001010': 1, '1011001011101100': 18, '0111010101001101': 7, '0100010001010011': 15, '0011000111011100': 27, '1001111100101000': 1, '0001100010101100': 9, '1000101110111000': 4, '1010001011011110': 21, '0010101010111110': 34, '0011000101001000': 42, '1010111000101011': 1, '0011111100101100': 1, '1001110100001001': 11, '1010011011111010': 3, '0011000100101000': 5, '110111100011010

1': 1, '0111001111101000': 48, '0011111110011001': 34, '1000001011000010': 1, '11001
10010000111': 13, '0101000101010011': 1, '0101110010010001': 3, '1100001111000001':
2, '0100101000100010': 9, '0111101000000001': 1, '0100111100000011': 36, '1010101110
001000': 8, '0101010111110101': 4, '1010010011111110': 6, '1011010011011101': 10, '1
110001111101110': 4, '0100010001100111': 1, '1100011001010101': 3, '110000001101000 1
0': 1, '1101010001100011': 3, '0010001011111100': 13, '0101101010100100': 9, '000111
0110101001': 1, '1010001111001000': 10, '1000100010100110': 3, '1011000101111100': 3
1, '1100011111000101': 4, '1100100100000010': 43, '0110110100010011': 3, '1010110100
001001': 77, '0101011110010111': 1, '1000010001010111': 54, '1100110100000101': 1,
'1000110000011101': 5, '1011010101011111': 3, '1111000111001000': 1, '11100101010101
11': 78, '0001100110101100': 4, '1100001001010110': 4, '1000100100110010': 1, '00011
01110101000': 54, '1100011110110111': 1, '1100100100110110': 171, '000101110110100
0': 1, '1100111000001011': 1, '1100011011100110': 7, '0101101111110110': 1, '1110000
101000011': 10, '0111011001101101': 1, '1011001111101100': 16, '1000101010110110': 5
9, '0011010101011111': 5, '1110111110110111': 2, '1010101000101000': 8, '01000100111
00011': 1, '1110110100011101': 4, '0001111100000011': 2, '1111100100001001': 1, '011
1001010111100': 1, '1100001011100110': 135, '0101100100010010': 1, '100101010100100
1': 10, '0001110000100001': 1, '1010101010111010': 49, '0001010111010011': 1, '00001
10000010111': 9, '1100100000100001': 2, '0110111110101010': 1, '1010100010001001':
1, '0001001111110100': 2, '1100101110100110': 112, '0111101110001001': 3, '101001000
1001010': 1, '1100000001110110': 206, '1010011011011100': 1, '0011111010111000': 6,
'1100001111110010': 82, '0101101010000000': 2, '1101111010000001': 6, '1010011001101
011': 4, '0001011011011101': 33, '0001001011101000': 84, '0101010111000001': 27, '10
10100100101011': 1, '0101010001111101': 2, '0101111100000011': 20, '001101010111110
0': 10, '0111010101101000': 1, '0101110010010101': 28, '0101000101010111': 4, '01001
10100000001': 2, '1100111111000011': 1, '1111110110011101': 1, '0101111100010111': 1
8, '1100000011110010': 29, '1100000001100000': 2, '0000011011010111': 3, '1110101010
100110': 13, '0001000111111100': 20, '1100011101000001': 12, '0101101010000110': 3,
'0111100011101000': 1, '0001011111101001': 2, '1010100000001010': 16, '0101000111000
101': 1, '0101011111000111': 5, '1110110000110111': 7, '1111010101001001': 6, '01000
10101010001': 1, '1100000101000011': 66, '0001001101101000': 10, '0011101110001101':
2, '0101100110100010': 7, '1000001011100010': 54, '0101000011111100': 3, '1110110101
010111': 1, '1100111110010011': 43, '1010011101010111': 1, '1011011111001101': 8, '1
010111000111100': 1, '0001011111011101': 33, '0101110001110001': 1, '110001101101001
1': 38, '0011100110011100': 34, '0011111110101000': 49, '0100010011100010': 2, '1010
100100011000': 3, '1000010011000111': 1, '1010101110101000': 57, '1010110100011001':
15, '0101001111010101': 5, '1011011001001001': 31, '1110010011000011': 10, '00110111
11101100': 7, '1110100100111110': 3, '1101001011110010': 1, '0010010001101011': 2,
'0111111110101000': 4, '0011001001011101': 12, '0111001011011100': 3, '1100000011110
110': 201, '0100000001100110': 4, '1010001001100010': 1, '1010111111101010': 1, '110
0100010000010': 10, '1010000011110110': 1, '1000001111000010': 5, '101100110110110
0': 2, '1100100010100010': 201, '1010111010101010': 15, '1010110000101011': 3, '1101
010011010111': 1, '0010010001010011': 2, '1000000001101000': 3, '1010100000001110':
1, '0101011111000011': 18, '0101000111000001': 3, '1011110100111100': 3, '0010100100
101010': 9, '1010110000111101': 5, '1010111010111110': 14, '1001001111101000': 9, '0
011010001101101': 15, '1110100000100110': 1, '1010100000111110': 79, '11101100000000
11': 67, '1001000001011100': 1, '1010101100101110': 2, '1100110100110110': 10, '1010
100100111010': 13, '0001101110100100': 1, '1100101011110010': 1, '1010000001110110':
1, '0001011111001001': 15, '0011100000101001': 2, '1011000111111100': 29, '001000111
1101000': 9, '0011101101111000': 2, '1100100001000011': 1, '1100101100000011': 22,
'1011011011011101': 27, '0111000001101000': 31, '1100110110010101': 1, '010110001110
1000': 1, '0111010101110101': 1, '0000010101000011': 6, '1010001011100010': 5, '0100
110010000111': 3, '0101100100111100': 2, '0100110100010111': 86, '1001010001000001':
2, '0011111010011001': 36, '0110101010010110': 1, '1111000101111000': 2, '0101101010
101100': 1, '0110010001010011': 3, '1000100010101010': 8, '0110111010110111': 2, '10
10010001011011': 7, '1010000111111100': 17, '0101010111010001': 9, '001110000110100

0': 5, '0101111100110011': 1, '0100101000000010': 3, '1011111110101000': 2, '0100000
101000110': 1, '1110110100010111': 86, '1000001111110100': 1, '0101100010110100': 1
7, '1100001101110110': 59, '1110100100110110': 9, '0100000101010110': 1, '0011101000
001101': 2, '1100110000001111': 1, '1100111010100011': 36, '1011010001111101': 8, '0
101100010001000': 1, '0101001111110101': 1, '0101100110000001': 3, '1000110010011111
1': 1, '0100100100010100': 1, '1010110000101101': 1, '1110000101100110': 3, '0011110
000111001': 17, '1101100100110100': 1, '1011011001111001': 2, '1101010001110101': 6,
'0101100010000001': 1, '0011101010101001': 1, '1100000111100110': 27, '1010000101101
010': 87, '0100000001010110': 3, '0101001001100010': 14, '1100100001110110': 2, '100
0010011000011': 6, '1110110100001001': 3, '0111000011101000': 14, '010101111110001
0': 2, '0001000001010001': 1, '1011101110111110': 1, '1011110110111100': 3, '1000010
011010111': 4, '1110000111111110': 2, '0011111011111100': 2, '0011000011000101': 1,
'1110011011110110': 8, '0101100110100000': 12, '0001001001011100': 1, '1110110010010
111': 7, '0101011000000001': 1, '1000010101000001': 2, '1011111110001101': 7, '10000
00111110110': 11, '0001000001010100': 1, '0101011111100111': 2, '0011110000101101':
12, '0011011010001001': 3, '1010011011001011': 12, '1110001011111110': 23, '01011110
10010111': 32, '0101011011010111': 30, '0011100000001000': 32, '0110101110111010':
1, '1010110010011101': 7, '0111110110010101': 3, '0011001111001001': 15, '0111011011
010101': 13, '1100011011100010': 46, '1010100010111100': 17, '0101000101100010': 20,
'1000110000001001': 10, '1010001001101010': 30, '1000011110010111': 6, '111001101101
0111': 30, '0011111000011001': 28, '1100110010110110': 17, '0011010101111010': 1, '0
101111100000001': 91, '1100010011100010': 16, '0001001011111100': 87, '1010110000001
101': 7, '0100100100110100': 2, '0011100100011100': 28, '1100000101000010': 31, '100
0100000001011': 1, '0011110110101001': 7, '1000111100010111': 10, '111001111100001
1': 33, '1101101110000000': 2, '0110101110101010': 2, '0111111000100101': 1, '000111
1100011001': 8, '1000100110000010': 1, '1100110010100010': 10, '1101111010010101':
9, '1110000111101000': 2, '0011110000101001': 68, '0101011011110101': 17, '101100101
1011000': 1, '0111100010111100': 20, '0011110000100011': 1, '1110000111100010': 20,
'0001000001011100': 1, '1100001110100110': 3, '1110000111111010': 2, '10001100001011
01': 1, '1110011011110010': 1, '1010111000001111': 4, '1110110000110110': 2, '011110
1110010111': 1, '1010001001001011': 3, '0111100110011101': 1, '0001111000001001': 1
0, '0101010001010011': 9, '0100100000000010': 2, '0001100010111100': 15, '1110101110
111110': 17, '0011111011011001': 3, '0011000011101100': 58, '1010110010111100': 1,
'1000000101100010': 13, '1000111100000111': 2, '0011111100111100': 5, '0100101010110
010': 15, '1010010101011001': 11, '0101001101010111': 2, '1100000001110000': 1, '010
0011011000111': 4, '0011110110111100': 12, '1110010001001011': 3, '001111001001110
1': 76, '0101111010000011': 15, '1100110000110110': 14, '0011000111001000': 22, '010
1011011100011': 1, '0111010001000001': 16, '1010011001101001': 3, '0001100110011100
0': 2, '1011010001001101': 6, '0001111110011101': 33, '1110110100101110': 1, '111000
1111001010': 1, '1110000101111100': 4, '0111111110100001': 1, '1101011001000011': 5,
'1101000101100010': 4, '1110011111001101': 1, '1000101010011101': 1, '01001110000000
11': 36, '1110001101101000': 2, '1011111000001001': 18, '0011111110111100': 53, '101
0110000111100': 1, '1010100100001101': 2, '1110100110110010': 1, '0011100011101000':
3, '0010010101011111': 7, '1100110011010111': 4, '0101100100000001': 22, '0010100100
111110': 6, '1101001001000101': 1, '0100001111110010': 16, '0101000001000001': 13,
'0101001101100000': 6, '1000100001010110': 1, '1010011011011011': 1, '00111110101110
01': 4, '1010011111000111': 2, '0011010111101010': 1, '0011101110001001': 12, '11101
11010110110': 7, '1000100000011110': 1, '1110001011101000': 3, '0011011001111101': 1
7, '1101111111000001': 1, '1100111110000101': 1, '1110100100100010': 22, '0111011101
000001': 8, '0111101110001000': 5, '0011110110111101': 9, '0001101110000010': 1, '11
00000000110111': 6, '0011110001001001': 6, '1100000101110110': 202, '110001000110001
0': 13, '1011111010111000': 2, '1011000101101000': 38, '0010100110011010': 1, '11010
00001000001': 1, '1110101010111110': 20, '0111000001100010': 3, '0101100000010101':
8, '0001010101011101': 73, '1011001011001000': 11, '1010000001111100': 21, '10101010
10101000': 67, '1010100000101110': 15, '0101000011100000': 25, '0101101110100110':
5, '0111111110110101': 1, '1111010101110101': 3, '1001111100011001': 2, '11001101000

10101': 30, '0011111111011101': 3, '1100001001110011': 2, '1010001111101010': 167, '1010011011111110': 19, '1100011011110010': 11, '0111011111011001': 2, '1000000010110 0000': 1, '0010010101111001': 1, '0101001111101000': 6, '1100111100110111': 18, '100 0001011111010': 2, '0111111000111101': 3, '1010011001111101': 2, '1100000111110010': 27, '0001110100000111': 1, '0101001001010110': 1, '0100000001100010': 37, '000100011 1101000': 22, '0011111110111101': 29, '0100100000000011': 3, '0001010011011101': 7, '1000010100010101': 1, '0101011001010101': 46, '1100010011000011': 70, '101100010110 1100': 1, '1010010101111001': 1, '0100011001010011': 3, '1010101011001010': 1, '1100 011111100011': 26, '1010111010110110': 1, '1100100000110111': 2, '1100010101110110': 6, '1110101110010110': 9, '0110000011101010': 1, '0111111000110101': 2, '00111100100 10001': 1, '0011011111111101': 23, '1110010001000111': 11, '1100010001010101': 14, '1100001010110110': 8, '0100001001110010': 1, '1011101000111100': 12, '1010111110001 011': 10, '1110111110011010': 1, '0011111110101010': 1, '0011001011110100': 1, '1100 001101000011': 27, '0101111100110101': 3, '1001100000111100': 2, '1010000111111110': 65, '0010011011101010': 2, '0011000011111110': 5, '1110111100000011': 31, '100011111 0110110': 1, '0111111110111100': 4, '0001010001000001': 15, '0011011001111100': 4, '1011101010111000': 16, '0101101010000011': 1, '1110111101010111': 1, '0001010011111 100': 1, '0101011001100101': 3, '0011000011100000': 1, '1100101110010010': 13, '1110 101010010110': 6, '0111011111111100': 3, '1010100100001010': 14, '1010110000111111': 7, '1110010001000011': 64, '0001011111111100': 8, '1000011001101001': 1, '0101111110 010111': 30, '0010001011011110': 1, '1101010001000101': 5, '0101000111100100': 3, '0 111100100100010': 3, '1100101100110110': 47, '1010001101011110': 4, '100000001100101 0': 1, '1010010001000111': 1, '0101011011100110': 2, '1110101100010110': 1, '1100110 000110011': 17, '1001011001001001': 2, '1010101010011110': 14, '1001100100100110': 3 9, '0001000011101000': 24, '1110001011000010': 9, '0111111110000101': 1, '0100011111 100110': 2, '1011101100101000': 12, '1010011101001011': 8, '1110011011111010': 1, '0 101001101000001': 7, '0111000001011100': 4, '1100001011000010': 71, '110010010001011 1': 60, '1100011111010110': 4, '0011000011001000': 15, '1010001011101110': 50, '1100 011111110011': 3, '1111001101111100': 2, '1010010100001001': 1, '0100011001100011': 6, '1110000111101010': 8, '0111001111010010': 1, '1000010000011101': 1, '00011101000 00001': 19, '1100000111110100': 1, '0010100010111110': 10, '0110110000010111': 7, '0 011000101111000': 62, '1010110101001111': 1, '0100001111100010': 67, '00011000000111 00': 1, '1000101110111100': 6, '0111110010000001': 2, '0100000101110111': 2, '011101 0101000011': 8, '0111110110001001': 3, '0011010111000001': 1, '1100110110110011': 2, '0011111100011111': 1, '0101011101010001': 13, '1000000011100010': 10, '110010000000 0011': 57, '1010101011101010': 3, '1110010111000011': 6, '0101010001110110': 2, '010 0010011000111': 3, '1101111010110101': 1, '1110011011111100': 1, '1100010100010011': 2, '0100100110100010': 25, '1100100000010010': 3, '0110010001100010': 1, '0010010011 011101': 2, '0101101100010100': 2, '1011100110101000': 27, '0011101010001101': 1, '0 100010011100110': 1, '1000001110101010': 1, '0001011101001001': 20, '0001101111011100 0': 8, '1010100110100010': 1, '0011011011101100': 9, '0011011101001001': 241, '00111 11011011101': 4, '0101001010100010': 1, '1010100010010110': 1, '1000111010000011': 1 6, '1110011101010011': 4, '0101011111101100': 1, '1010000111101110': 8, '00111000001 01100': 41, '1011011011001101': 4, '0100100100010111': 6, '1110110000011011': 1, '11 10110100110111': 6, '0101110010001001': 1, '0000110100000111': 3, '110001101101011 0': 2, '1010111000111111': 2, '1000010011011101': 1, '0101111010010001': 6, '0101011 011010001': 17, '0001111010010101': 5, '1101111110010111': 2, '1110010100000011': 2, '1010110100001111': 15, '0110100000110010': 1, '1101111011000001': 1, '0010000101111 100': 2, '1110100000100000': 1, '1010100000111100': 19, '0111101110000010': 1, '1000 011011010111': 23, '1100100000000110': 5, '1100111100100011': 22, '011111111000001 1': 1, '1100010100010111': 7, '0100100110100110': 6, '1010011101001101': 1, '0011000 011001101': 3, '0011000000001001': 2, '1001110000111001': 1, '1100100000010110': 14, '0011100001111100': 8, '1010010011111111': 1, '0011000101011000': 7, '01001111101001 10': 1, '0011111000001100': 1, '0111101010100000': 5, '0011011111001101': 41, '10100 01010101010': 3, '0011110110001000': 1, '1000100100001000': 1, '0011011111101000': 2 7, '0000001101110110': 2, '0001100000101100': 3, '1100011101100010': 4, '001110011 00

11101': 6, '1100011111010101': 10, '0001001111001000': 4, '1000011111010011': 2, '0111001111110100': 3, '1010110000000011': 8, '1011000101001000': 6, '1010110000011101': 42, '1010001111001101': 1, '0101100000100000': 23, '1010010111001111': 1, '1011001011011100': 15, '0111100010111000': 3, '0001001001011101': 1, '0100001101010110': 1, '0011101110001010': 3, '0010011001111100': 1, '0011010111101001': 3, '0101001111000010': 8, '0010000111001010': 1, '1100011111100010': 30, '0111111111000011': 1, '1000001001101010': 3, '0011110110011111': 1, '0101100100110010': 4, '1000000100111001 0': 1, '0100001111000011': 6, '1100000001100011': 4, '1011101000011101': 1, '0111011101010001': 1, '0011110000111100': 13, '1100011001000111': 31, '0111000011111100': 22, '0010011111001001': 3, '1110111100000001': 1, '0001010001000011': 5, '1011110110011001': 1, '0100110000000111': 17, '1010100011011111': 4, '1011110100011101': 76, '1101011101000011': 7, '1000110000110110': 1, '0101101110000001': 6, '1111110110000100 0': 1, '1011010001011001': 14, '0001111110001001': 23, '0000010001010110': 1, '1000100100011110': 2, '0011100000011001': 4, '0001010111111100': 3, '0010010001011111': 7, '0011000000101000': 8, '1010011111101000': 3, '0110000011100110': 1, '1111001011011100': 3, '1000101010000010': 5, '0011011101111101': 15, '1010001110111110': 4, '1010011001011001': 1, '1100001001010111': 16, '1100110000010001': 2, '1111010101011101': 6, '1000101000100010': 6, '1011110110001101': 2, '0111111010111101': 1, '1010101110001011': 1, '0000100110110110': 2, '1011110110011101': 10, '1110000011100010': 16, '0011001111011000': 14, '0111100000111100': 19, '1110000011110010': 2, '1010111010001001': 16, '0111010001010111': 3, '1110001111000011': 1, '0000111010010011': 1, '0011011101011001': 44, '0111100110000010': 1, '1010000011001000': 5, '1110110010100111': 1, '1010100010111110': 67, '0010100100001001': 2, '1101101110110110': 7, '0001111010011101': 26, '1110101100100011': 1, '1111011001010111': 1, '1010100110101110': 16, '0010010111011100': 1, '1011101010101100': 20, '1000010111000011': 5, '1110101010100000': 1, '1100000001100110': 40, '0100011011010111': 42, '1010111010101000': 1, '0100111010010111': 32, '1100011101000111': 49, '0000111100110111': 1, '0111010001010101': 11, '0001100100111000': 5, '0110010101011101': 1, '1011110000111101': 12, '0001110000011001': 11, '0100101011000010': 1, '1000111110010011': 3, '0101110100110110': 2, '1111001111111100': 7, '1000000001100010': 28, '0010010001011001': 2, '0101100100100110': 4, '1000001001100110': 2, '1101001001100010': 1, '0001110000110111': 1, '1111101110111100': 9, '1110110110010111': 19, '1100100110000011': 2, '0101011011100010': 1, '1100110000110111': 77, '1010010001000011': 5, '0101111010000010': 1, '0011010011101000': 16, '0111100100011001': 2, '0000100000100010': 5, '1100111100100111': 4, '1100000111000011': 6, '1010011111101011': 2, '0101110100110011': 2, '0011100000011100': 20, '1010111100001101': 1, '1110001011001010': 3, '0111010001111101': 4, '1100010111000111': 23, '1000110100110111': 3, '0011101010101010': 21, '1100111110001010 1': 7, '1100111010110111': 40, '0001010011101001': 1, '0010000011111110': 12, '0101000101110010': 5, '0001010101101000': 1, '1000000011110110': 20, '1010010000011101': 1, '0011011011101101': 7, '1000101110101110': 3, '1010100111011110': 1, '0001100100101100': 6, '0001000001100010': 4, '0101011111010111': 32, '1010110110011111': 7, '0101111110110101': 9, '1000010101110010': 1, '0101101110100100': 5, '1100110100000000 1': 27, '1011101100111110': 2, '1000010001010011': 6, '1110101010001001': 1, '0111111000000011': 1, '1110101110000010': 5, '1101011111000101': 1, '0001101100111100': 10, '0001001001001000': 2, '0011010101011011': 2, '1000101010110010': 6, '0101111000010101': 62, '0001110000000001': 13, '0010101110111100': 7, '1011100000001001': 3, '1110010111100010': 2, '0101010001010111': 62, '1010001010001010': 1, '0011000000011000 0': 2, '1100111100110010': 1, '0111100100001000': 2, '1110001111110010': 8, '0111110000010101': 28, '1100100010110010': 41, '0100100100100010': 32, '1011100100111100': 18, '1110110100000010': 1, '0111110010000011': 1, '0111010101000001': 25, '0101000101000111': 1, '0101110010000001': 17, '0101100000111100': 1, '0011111111101001': 1, '1010001001111110': 22, '1100010011000001': 2, '1000010100010111': 1, '1000110110110011': 1, '1001111000100001': 1, '0101011001010111': 20, '0101100000100001': 1, '1010001111001110': 5, '0011100100001100': 1, '1110101010111100': 7, '1100101100110010': 7, '1110010001100011': 11, '1100011111110110': 41, '1011100110111100': 32, '0101010111000101': 7, '1000110010100111': 1, '0011000110101000': 5, '1100111010000001': 4,

'0101101010110101': 2, '1011011101001001': 31, '1011111010111101': 3, '0010110100101
010': 1, '1001000001111100': 1, '1000111000010111': 10, '1000010101010101': 2, '1011
110100111101': 9, '0101011101000011': 25, '1010000101001001': 4, '1011111010011101':
41, '1110010101010001': 1, '0111101110101000': 41, '0011000001101100': 50, '00010101
01011001': 8, '0000100000101010': 3, '0100111110010011': 8, '0010001111011100': 1,
'0011000001101010': 11, '1101010101000001': 39, '0101010011010001': 2, '101011010000
1011': 53, '1100110010100111': 5, '0011000101011110': 1, '1001100010111100': 2, '101
0111010101011': 2, '1010110000101010': 5, '1101110100010101': 26, '001111100010100
1': 25, '1110011101110111': 2, '0110101110000011': 1, '0000001001101010': 1, '100011
1110011111': 2, '0101101010010101': 5, '1100100110110010': 27, '0011001110001100':
1, '1001101110011100': 1, '0001101010100000': 2, '0101011111010001': 7, '11000100111
00111': 2, '0111001001111100': 3, '0101111010110101': 15, '0011110100001101': 110,
'1000011001000111': 4, '1100000001010111': 33, '0011011111001100': 1, '0011011001101
001': 25, '0000011001010011': 2, '0010010001001011': 3, '0010110000111111': 1, '0111
111010010101': 9, '1011010001111001': 1, '1000110010100010': 1, '1010010001001101':
11, '0011000101001001': 60, '1101111010010001': 1, '0011001110111100': 9, '000101101
1111000': 1, '1110100110010110': 3, '1010100110001110': 1, '0111110000101000': 1, '0
100110110100011': 2, '1010110100101010': 4, '0101101110110100': 41, '101101101100100
1': 15, '0100011011010110': 1, '1100000001100111': 1, '1010111010101001': 3, '011101
1101010101': 2, '1101010101010101': 37, '0001110000011101': 53, '0101101100010101':
5, '0010110010101010': 2, '1000110010010111': 4, '0101101100100100': 2, '10111011101
01100': 9, '1000100011000001': 1, '1011001001101000': 15, '0101111110101000': 1, '10
10101110001100': 3, '0100011101100010': 2, '1011001101111100': 5, '100001101111001
1': 2, '1010010101011111': 42, '1110110010000011': 9, '0011011011101000': 36, '00110
11101001011': 2, '1110010001011111': 4, '0101001011000011': 1, '1010010101011010':
1, '0111111110011101': 21, '0011111010101100': 14, '1010000111111010': 6, '110000110
1000111': 3, '0011001011110000': 1, '0101111100110001': 3, '1010111110010111': 2, '1
010001001011010': 1, '1100101110010111': 28, '1011111100011101': 40, '01011011101100
10': 8, '0101100100000011': 3, '0110001001010101': 1, '0111000101011001': 1, '000110
1010110110': 6, '1100000101010011': 8, '0101110000110010': 1, '0111000001111100': 3
0, '1000100010101000': 6, '0111010100000101': 1, '1100111110000010': 3, '10000011110
10110': 7, '0100110000110111': 4, '0000101110100011': 1, '0110000101101110': 1, '001
1010101111001': 8, '0100011001110111': 6, '1110011111110110': 1, '1010100100101000':
23, '0010001111111100': 2, '1100000111000110': 2, '1001101110101010': 1, '1100111100
100010': 9, '1100100100101010': 1, '1110100110111110': 4, '0101001111000000': 4, '10
10100100000011': 1, '1101100010110010': 1, '0110100000101000': 1, '110100011111010
0': 1, '1100100100110010': 49, '1010010111011001': 1, '0010100000111000': 1, '010110
1000110110': 7, '0011100010001101': 4, '1100110001000011': 9, '0010101010101010': 2
7, '0110011011001010': 1, '0100001101110010': 2, '1000100110100110': 2, '10000010110
00011': 3, '1100001001100011': 4, '0011110000101000': 31, '1000000101101010': 9, '01
11010101011001': 4, '1110110100001011': 5, '1010101100001000': 1, '101011101001011
1': 1, '0001001011111110': 1, '0101111010110110': 7, '0101001111100110': 15, '101001
0111101000': 1, '1010010100101011': 1, '1001011111111101': 1, '0001100100011100': 1,
'0001111100011101': 19, '0000100010111110': 2, '0100100000100011': 2, '1000011111000
011': 13, '0100110100000111': 8, '0010101000111110': 1, '0111000111101000': 21, '101
1100000111000': 2, '1100111010010101': 6, '0000000001101000': 1, '0101001011010111':
3, '0010011011101110': 1, '0011000011111010': 2, '1110111100000111': 2, '10101111110
00011': 1, '0101110001000011': 2, '0100000111110110': 20, '1001110000101000': 1, '10
10011111111000': 2, '0100011111110011': 1, '1101011101000101': 1, '111011110001110
1': 1, '0110011011000111': 2, '0110011100001000': 1, '1000101010100110': 7, '1100111
111010111': 5, '0110001111111010': 1, '0011100001011000': 1, '1010001001001010': 4,
'0111101110010100': 2, '0001110100011001': 7, '1010111110111111': 2, '010100100101 01
01': 5, '0011010111111000': 1, '0000110000000111': 3, '0011110100111100': 8, '001100
1011001001': 10, '1010010101010111': 3, '0010101110101010': 23, '0001111010001101':
7, '0011000111001100': 7, '1010010001101110': 2, '1100000001010110': 21, '1100101110
110010': 98, '0100111100010011': 8, '1111010101111101': 1, '0110011001000001': 4, '1

011110000001101': 13, '1100110101110001': 1, '1100001101110010': 16, '01010011110001
01': 2, '0011100100001000': 45, '1110101010111000': 1, '1101101110010101': 1, '01101
10100110111': 3, '1110100000000011': 4, '1000111010110111': 1, '0100011001010101':
1, '1110111000110111': 4, '1000111000100011': 1, '1100000111010110': 33, '0001110100
001101': 15, '0100100100010110': 2, '0001000111111000': 5, '1100100010100110': 38,
'1010111010101110': 2, '0101110010000011': 5, '0101000101000101': 4, '10100101110000
11': 1, '0101110000110101': 16, '1110000101110110': 21, '0000001111111100': 2, '1101
001001100000': 1, '0101100100100100': 5, '1100010111010010': 1, '0010000001101000':
3, '0110110100000011': 7, '1011001010111100': 3, '1101000111110110': 4, '00011000101
10100': 5, '1110101110110010': 7, '0101011001100010': 2, '1010011011001010': 2, '010
0100000010101': 1, '0111011001001001': 10, '1110001101001011': 1, '101111101011110
0': 9, '1100001001000011': 11, '1010101110011111': 2, '0000000011110110': 1, '011010
0100110110': 3, '1110010001011101': 6, '1000110000000011': 52, '0101000101101000':
1, '0001111100000001': 2, '1000001111111110': 21, '1100101110000011': 12, '000010101
0111010': 3, '0010000001111010': 6, '1011000101111000': 6, '1010001111001100': 4, '1
010010111001010': 2, '0011110100111110': 1, '1110011011011101': 1, '011101101111110
1': 3, '1010010011101010': 3, '0100101100110110': 10, '0111001111011100': 10, '10111
01000101000': 19, '0001000111100100': 1, '0111001101010100': 1, '1011010101101000':
1, '1111101010110100': 1, '0010101110011110': 3, '0011001001001101': 2, '01011011100
10101': 5, '0101010000000011': 1, '1100001110000110': 1, '1110011111011101': 6, '011
1000001111000': 4, '0101110010110110': 1, '0100110000100011': 15, '1000010101010001
0': 41, '1100111111010011': 1, '1011011111001001': 27, '1011010001101001': 12, '1100
101011100010': 12, '0101011101000101': 11, '1010010101001010': 2, '011110111001110
0': 6, '0101001011010001': 2, '0111111100011101': 11, '0010011011001001': 1, '110011
1010010011': 24, '1010000001001000': 4, '0010010101001111': 3, '0001000101101000': 4
4, '0101001101100110': 2, '1111110000000001': 1, '1111110010010101': 1, '00100101110
01001': 2, '0111011100001001': 1, '0100001101100010': 5, '0101100010100000': 21, '00
11001011101010': 18, '0101011111110111': 2, '1000000001101110': 2, '111100111111010
0': 3, '1010100000001000': 2, '1000110100000111': 5, '0011000000111100': 2, '1000100
110111110': 3, '0111110000010111': 8, '0111111000010101': 2, '0001100010101001': 1,
'0010000111101110': 1, '1101100110101100': 1, '0101110110010001': 6, '01000010111001
10': 14, '1101011111001001': 1, '0010101010101100': 3, '0010001101111010': 1, '00010
00001001000': 6, '1101101010110100': 8, '0001101000110100': 1, '0111000111010101':
1, '1010001011011100': 5, '1110111000010011': 6, '0011110100000001': 1, '10001000100
01000': 1, '1110011011100010': 5, '0011000101011100': 35, '1110011101000011': 21, '0
001111000000001': 5, '1000110000001011': 4, '0011110100111000': 6, '100010001001011
1': 1, '0001010101000101': 3, '0110010101001000': 1, '1000001010100010': 1, '1011110
000101000': 4, '1000011011010101': 2, '1100111110100111': 5, '1011011001011101': 23,
'1100000111000010': 22, '1010110100101011': 3, '1100110001100011': 2, '0011101001111
000': 2, '0001001101101100': 1, '0111110100010111': 8, '1010001101101011': 1, '10100
01011001000': 3, '1001100000110110': 1, '1010111110011111': 30, '0100001001000010':
1, '0000101110000010': 1, '1010010101111010': 3, '0010000111001000': 1, '10100001111
01100': 5, '0101111010100110': 2, '0011000101101100': 36, '0011001010111000': 4, '11
01110110100010': 1, '0100110101000011': 2, '1011110000111100': 3, '101101011100100
1': 12, '0111111100001001': 21, '0001100100001101': 1, '0101100100010111': 6, '01000
01111100110': 7, '1011000001001000': 4, '1000110100001111': 1, '1010011111101010': 1
2, '1010111110111110': 12, '1000111000000011': 20, '1100000011010111': 2, '011101010
1010001': 5, '0111110010010111': 1, '1000110000010111': 39, '1100000111010111': 5,
'1110111000010111': 11, '1011100100111000': 7, '0010110100001001': 8, '1101101010100
100': 2, '0111110100000011': 6, '0011100010001100': 2, '1010011111111101': 2, '11001
10110010110': 3, '0011000101111110': 7, '0111101110111010': 1, '1101001011110100': 1
4, '1011010100111001': 1, '0101011011100101': 3, '0001111010001001': 13, '0101111010
000101': 10, '0011010000101001': 2, '1010110100011011': 16, '1110111010100011': 2,
'0010100000111110': 9, '1010010111011101': 4, '0011010101111000': 3, '00001011101000
10': 10, '0101100000000111': 1, '0101110110110101': 1, '0011101100011000': 1, '01111
00000000101': 1, '0001011111010111': 4, '1010011101011101': 14, '1110110000111001':

1, '0110001111100110': 3, '0111101110011000': 2, '1100000001000001': 2, '11001101001
00111': 10, '1010110001011101': 1, '0101011001000101': 11, '1100011001110011': 2, '0
100001011000010': 6, '1001000111101000': 4, '0100000101100110': 3, '001011110000110
1': 1, '1101110100010011': 2, '1110011111101010': 3, '0101111110110001': 1, '0000011
111101000': 1, '1010110110011011': 1, '0001000001111000': 8, '0101111010100010': 1,
'0011010111001101': 16, '1000111000001101': 2, '0111001011111000': 7, '1011111100101
001': 4, '0010101111111010': 1, '0100100000100010': 36, '1000011111000010': 2, '0001
010000001001': 2, '1010101010101100': 14, '1011001011001100': 1, '1010000001111000':
7, '1010111100101110': 1, '1000101000110110': 3, '0011100010111010': 2, '01010101100
10101': 2, '0001110010111101': 2, '0010001110111110': 1, '1011101000111000': 1, '100
0011001010111': 16, '0010101000101100': 1, '0100110000001001': 1, '101010001000111
0': 2, '0011011011111000': 12, '0111011101011101': 15, '0101000101000011': 5, '01011
10010000101': 5, '1010010101101010': 10, '1101110010010111': 1, '1000110010110110':
2, '0011010000010101': 1, '0101111110000010': 2, '0100011101010111': 31, '0101110101
010101': 1, '1010000111101000': 20, '0001000001101100': 6, '1010000110101010': 2, '0
101110100011101': 5, '0011010111101100': 4, '1000011011000011': 21, '010111110100000
1': 3, '1100010111100011': 6, '0101011100000101': 1, '1011100010111110': 2, '0101110
100100000': 2, '0101101000000011': 1, '0011010111011001': 9, '1110111010010110': 1,
'0011001011011000': 13, '0111111100010001': 1, '1010110110001011': 3, '1110001011110
010': 8, '1010011011000101': 1, '0100111110010111': 49, '1110001111101010': 10, '110
1111000000011': 4, '0111000101010101': 3, '1100110001010111': 13, '110010101010001
11': 2, '0101101010000010': 8, '1001110010011101': 1, '0001000101001001': 8, '1100010
001100100': 1, '1100011011010101': 10, '0011111010101010': 2, '0011000100111100': 4,
'1011010111001101': 2, '1011101111101000': 2, '1100110110000110': 1, '01011111000100
01': 11, '0000000101100110': 1, '0101010101001001': 3, '1010101110011010': 2, '10110
00011111100': 27, '0110111110000111': 1, '0111011001111101': 1, '1100110100110010':
5, '1010101100101010': 27, '1000011101001011': 2, '1101000001100000': 3, '1010001101
101010': 26, '0100010111000011': 11, '0010100100101100': 1, '0001000101001000': 8,
'1100010001011101': 1, '1101111110110110': 1, '1001111010010101': 1, '01110000110010
00': 2, '1010110100101110': 1, '1111111000011101': 2, '1100110001010011': 3, '011111
1000011001': 1, '0011110011011101': 1, '1011100010101100': 4, '0011010011111101': 1
6, '1001000011101100': 1, '1110100000010011': 1, '0110110100100111': 2, '11101101001
11110': 1, '0100111000010111': 17, '0100110101010111': 3, '1100100010010011': 1, '01
01110110100001': 1, '1111001011111100': 4, '1010100110111010': 7, '001001111100101
1': 1, '1100111110000001': 8, '1110100100100110': 2, '0100011101000111': 4, '0011010
000001001': 6, '1100010111110110': 19, '0110100000110110': 2, '1100010100000001': 1,
'0111111110010101': 16, '1100011111010010': 2, '1100100100010011': 14, '110110111000
0010': 1, '0000101110110110': 5, '1011011011111100': 8, '0101110000100101': 3, '0011
101010101110': 2, '1001011001011101': 4, '1010100000101000': 26, '0111111010000001':
3, '1000110100010011': 6, '1010010111011111': 12, '0001111100110101': 1, '0011101110
101010': 13, '0101100010110010': 2, '1000001111110010': 7, '1011110000011001': 15,
'0111001001111000': 1, '1100110110000111': 15, '0111001011001100': 1, '1100011101110
111': 23, '0010100100011100': 1, '1110001101101010': 2, '0111001001000000': 1, '0010
000011101010': 8, '1001110100001101': 1, '0010011111111101': 1, '1110000101011111':
1, '1100100101110110': 1, '1000101110100110': 10, '0011111110011100': 8, '1110111000
000001': 2, '1000000011111110': 9, '0100101110010010': 2, '0011100010011100': 22, '1
010111110001101': 4, '0011111100111001': 2, '0011111100101101': 4, '010001010001011
1': 3, '1100101111110110': 6, '1000111010000111': 3, '1010010101001101': 11, '101001
0001011001': 6, '1000111100011101': 4, '1100000011000011': 6, '1000110110010011': 1,
'1011011111111100': 8, '0001101100111000': 1, '0011011001011001': 22, '0110110110010
111': 1, '1111101010111100': 8, '1100100110000110': 5, '1100001110100010': 5, '00111
10010001000': 3, '0010110100011101': 8, '0100100010010110': 1, '1110010101110110':
2, '1010110010111111': 1, '1101011001010101': 7, '1010110100000011': 11, '1000100110
110010': 2, '1110101110010111': 3, '0101111000000111': 3, '1010001101001010': 4, '11
00101000110010': 16, '1011110001111101': 1, '0101111110000101': 21, '010010101001011
0': 7, '0100000111100010': 20, '1100100110010110': 32, '0111111000101001': 2, '10101

01100111100': 4, '0001111100010101': 10, '0111100100110010': 1, '0111110000000101':
3, '1010011101011110': 1, '1011010011001001': 3, '1101011001000111': 1, '00110011010
11101': 12, '1110011001001001': 2, '0111011001101001': 2, '0101000111000010': 2, '11
00010001000101': 4, '0110000111110010': 2, '1000111010010101': 1, '110001010110000
1': 1, '1100100000000010': 19, '1001110010110110': 1, '0111011011110001': 1, '111011
1010100000': 1, '0010100000111111': 1, '1000000101111110': 7, '1011100010001000': 4,
'1000000101000011': 3, '1010011011001001': 8, '0010100100101000': 2, '01000111110001
11': 12, '1101011001010001': 3, '1001000111101010': 1, '1100001011100000': 7, '00111
00101111100': 1, '0100000111010111': 1, '0001010101101001': 9, '0011001011101101':
2, '0011001001101001': 1, '0010000001101010': 10, '0111110100100001': 1, '1001000011
111100': 4, '0101110000110001': 6, '0001100110111000': 1, '1000001101101010': 2, '01
01101100010111': 3, '1100110110010011': 11, '0000001011100110': 3, '001011110101011
0': 1, '1110110010011111': 2, '0101000011110100': 10, '1110101110001100': 1, '000010
1010010110': 1, '0011101011101000': 12, '1110111110000001': 2, '0100101000100011':
1, '1010000001011101': 2, '0110100100000111': 1, '0111100000001001': 2, '10001101100
10111': 5, '1000110001000011': 1, '1101101000100000': 1, '1001001001111100': 1, '011
0101010110010': 3, '0101111010100000': 5, '1010001011001010': 9, '1000111010010111':
32, '0011011111101101': 4, '0011110110001101': 15, '1100101100000010': 10, '00101100
00101011': 1, '0111100100010110': 2, '0010010101001101': 2, '1010100100011011': 1,
'1000100010111110': 8, '1100100000010011': 8, '0101011001010011': 3, '11000100110001
01': 2, '1010001001111010': 8, '0101100100010101': 12, '0000001111100010': 5, '10010
10101011001': 2, '0101100100100000': 17, '0001110000110001': 1, '0100001111010111':
3, '1110001100011101': 1, '1011101100001100': 1, '0101110100110001': 8, '10001010101
01110': 6, '0010110010111110': 1, '0110000111101000': 1, '1101111000011101': 1, '000
1010001101000': 2, '1010111000000011': 1, '0011000011011101': 5, '1011101011011101':
1, '0101100000010111': 3, '1000001101010111': 1, '1011010011101000': 3, '11001101101
00011': 6, '1011000011011101': 1, '0001011101011001': 6, '1010100100100010': 1, '101
1110010011101': 9, '1000111100110111': 3, '0101110000010011': 10, '111010110000001
1': 1, '0001111010010111': 2, '0101011011010011': 4, '0101001010100000': 4, '0101011
001101001': 1, '0101111010110111': 5, '0111111010101000': 4, '1010100011101010': 1,
'0101110000110100': 3, '0111010100111101': 1, '1000001111101010': 18, '0111100100101
000': 18, '1111100110111100': 1, '1000000001111100': 1, '1110010101001101': 4, '0110
000101000011': 1, '1010011011011001': 8, '1010100110011110': 2, '1001010101101000':
1, '1011100101101000': 1, '0010010001101010': 2, '0111110100001101': 11, '0011001101
101101': 1, '1110100110000010': 2, '0001001111101100': 7, '0011001111101001': 1, '10
10101111101001': 1, '0001011101100001': 1, '0100101000100110': 1, '010011110000011
1': 2, '0011101110101001': 1, '0111001011011101': 1, '0011001001011100': 8, '0011000
111101010': 5, '1101010001010101': 15, '1110001101010111': 1, '1111100000111100': 2,
'0111011011001000': 1, '1000101000101010': 7, '0111010110001001': 1, '11000100111101
10': 11, '1100011101100001': 1, '1100000101000110': 4, '0100000011010110': 4, '01011
00110010110': 2, '0011010011101110': 1, '1010011001011011': 1, '0001011011001101':
5, '1010001001101001': 1, '1011001111111000': 14, '1010000011101000': 16, '111011111
0001001': 1, '1110111010010101': 1, '0111101000001000': 1, '0001100100111100': 17,
'0011011110001001': 3, '1101011111000001': 7, '0011111000111001': 1, '10110100111111
01': 2, '0100010001110111': 15, '1101010101000011': 10, '1010000001001010': 12, '110
0111010100110': 10, '1100010001001001': 1, '0001011011111100': 6, '110001101100000
1': 5, '0100110100100011': 8, '1100110000110010': 4, '1110101100010111': 4, '1111110
100111101': 1, '1001000111111100': 1, '1110100110100110': 4, '0110000001110010': 1,
'1100111000100011': 29, '1101111010100011': 1, '0001000111011100': 3, '0100001001110
110': 8, '0100010001000111': 19, '1010011011011110': 1, '0010101010111010': 4, '1100
001111110100': 7, '0010000001001000': 1, '1101011111110111': 2, '1000111010100010':
4, '1110100000110110': 22, '1110000101011001': 1, '1101110100010111': 11, '001111001
0111000': 3, '0010001011101110': 2, '0111111010011101': 17, '1100111110100011': 26,
'0001100100000001': 1, '1011101010011100': 10, '1101101010111000': 1, '1110111000100
011': 2, '0001001011100010': 5, '1000110110001111': 1, '0011101100101100': 12, '0010
011111010011': 1, '1101111100000001': 4, '0100010101110011': 3, '0101100011100000':

1, '0100000101000001': 1, '0011100110111010': 1, '1111110000010101': 1, '01110110010
01101': 1, '0101000001010111': 6, '1100011001100010': 6, '1110000101000010': 5, '110
1110100010001': 6, '0101111100011101': 1, '0101100110101000': 3, '0101110100010001':
38, '1000001011101000': 9, '0011000110111100': 2, '1100101000100011': 3, '1100110101
000011': 7, '0111001011100100': 2, '1101011001110100': 1, '1010111000111101': 3, '10
00100000101010': 9, '1010111000001001': 10, '1000101010011000': 2, '101101000111110
0': 2, '1010111100011011': 3, '1100101000010111': 13, '0111111100010011': 1, '010110
1100000010': 1, '0010111110111110': 2, '1011100100001000': 4, '1101010101010001': 3,
'0011000001001100': 5, '1000100010011011': 1, '0010110100001011': 10, '0100110110010
111': 18, '0101010101110101': 17, '0001011011101000': 7, '0101111010100011': 2, '110
0111010110011': 4, '1011000111011101': 1, '0101110110110110': 1, '0010010101001001':
6, '0101101010111100': 8, '1110110110100111': 1, '1111010001001001': 2, '00100001001
01010': 1, '0110111110010111': 3, '0101111010100001': 7, '0011011010011101': 9, '101
1100010111100': 35, '1100010101010001': 8, '0001010011010101': 2, '111001000101001
1': 16, '0010000011101000': 5, '0011100101001001': 1, '1111010101010101': 3, '110011
0100110101': 2, '0011110100001000': 3, '1100101100010110': 10, '1110110000100011':
8, '1100111110110011': 2, '1000001001111010': 2, '1100010001110110': 20, '1010000101
011110': 7, '1110010001100111': 2, '0011100100011001': 8, '0100110000010101': 2, '10
10011001010111': 1, '0001011011000001': 6, '1100100111110110': 3, '1001101111010100
0': 10, '1001000101111100': 2, '1010100100011010': 2, '0101000111110100': 20, '00010
11101001101': 1, '1101100000110110': 5, '1000101100100010': 5, '1011010101111101':
8, '0001100111111100': 1, '0110101010110110': 11, '1110100010101000': 1, '1011000011
011100': 2, '0001101110010111': 1, '1000001101011010': 1, '0011001001001001': 5, '11
00101000010110': 3, '1001101010101100': 1, '1010011101001111': 2, '010001111110001
0': 2, '1110011011111110': 2, '0111111110000001': 3, '1000110000100011': 2, '1110000
111110110': 20, '0100101010000011': 3, '1100011100010111': 3, '1010001011011000': 1,
'0111010101000101': 7, '1000101110111110': 18, '0010001111001110': 2, '1100011111000
010': 7, '0111011011101001': 2, '1001100010100110': 1, '0101101110010100': 3, '01011
01100000001': 4, '1010111010001101': 6, '0100111110110110': 3, '0011000101001100':
5, '1100001101010110': 5, '1001001011111100': 8, '1010110001111110': 1, '11011111100
11001': 1, '1101111010000101': 3, '1110011111100010': 1, '0101110000001001': 5, '101
0000101101100': 4, '1100001001110010': 15, '1000100100010110': 3, '110011100001010
1': 5, '1110010001010001': 1, '0101001110100010': 2, '0100011111100111': 1, '0011000
011001100': 4, '1010101110011100': 10, '1011000011111010': 1, '1000100100100010': 1
0, '0000101100110110': 1, '1100000011110100': 1, '1010100100111100': 14, '0001110000
010001': 2, '1110101111111110': 1, '0001101010011000': 1, '0001010001010101': 9, '01
01001110110110': 1, '0111011111100101': 1, '1000011111001001': 1, '100000010100001
0': 2, '1000101000001010': 1, '0000010101110111': 1, '1110001111100110': 9, '1001101
010101000': 12, '0011110000000001': 1, '0100111110100010': 5, '1100001001100110': 1
0, '0001101110001000': 10, '0100101111100110': 1, '1001001011101010': 1, '0101111000
100011': 4, '0001000101111000': 2, '0101001101110010': 1, '0011110100101000': 19, '1
011110110101001': 1, '1101011111010111': 5, '0111100100010101': 1, '001011000010101
0': 1, '1100000001010011': 8, '1011000001101010': 1, '1010011011011101': 15, '001110
0101101000': 7, '1010001101111100': 6, '1110110100000101': 1, '0100000101110010': 6,
'1100111110100110': 9, '1010000101111010': 13, '0111000101101000': 19, '000010000000
0010': 1, '0100000001010011': 1, '1000101010010110': 1, '1011110010001001': 3, '1101
100100110101': 2, '1010000001011110': 5, '1100010001100111': 11, '1101011101100101':
1, '0111000101100010': 3, '0100001111000010': 4, '0111001011100000': 1, '01111111000
00001': 5, '0001010001100011': 2, '1000011101011111': 1, '1110110110010110': 1, '110
0100110000010': 17, '1110011001100111': 1, '0111011001000111': 1, '101010000001111
0': 3, '1101101010110000': 2, '0001011101000011': 1, '0101000111111100': 1, '1110010
001100010': 3, '0000110011011101': 1, '1110101010101110': 4, '1011110010111100': 1,
'0011100100111110': 5, '1010010101101101': 1, '1001000011101000': 1, '101010101111
10': 8, '0011001011111101': 1, '0010011101111110': 1, '1100001111000110': 18, '10101
00010101110': 12, '1101100110110110': 2, '1000000111101010': 8, '1000110010100011':
1, '1011010001111000': 1, '1010111100011001': 5, '0110000001110110': 2, '11001110001

00111': 3, '0011111000101000': 6, '1001100000111000': 1, '0110011111010111': 8, '101
1000001011100': 6, '0101101010010010': 1, '0111111010011100': 2, '1101000111010101':
1, '1000000111100110': 2, '0000000001111110': 2, '0110100110111110': 1, '11001010000
00011': 9, '0101101100111000': 1, '1011100110111110': 3, '0101010111000011': 8, '101
1000010111100': 2, '1010100100001001': 2, '0100110110000011': 6, '0000010001000011':
2, '0100101110000111': 1, '0101010101110111': 9, '0100011001100010': 1, '01011010111
10110': 3, '0111010101111100': 1, '1100011111110010': 10, '0011111111001001': 3, '10
00110010110010': 1, '0011001101111101': 3, '1000000111011110': 1, '110010110000011
1': 4, '1100100101010110': 1, '1100101000010010': 2, '0100010100000011': 1, '1100111
000110111': 15, '0100101100000011': 2, '1010011011001101': 6, '1110001011111100': 8,
'0001011101100011': 1, '1101011101010001': 2, '1011111010101001': 2, '00110010110010
10': 1, '0010001001101010': 7, '0100010000000111': 1, '0010000111101100': 1, '001100
1111001010': 3, '0111111110001001': 15, '1010101000001000': 1, '0011011011011100':
4, '1000110010000111': 1, '0000101111110110': 1, '0101001011000000': 11, '0110010001
000011': 9, '1001101110101100': 2, '1010110010101000': 3, '1010111100001111': 1, '10
00100000110110': 9, '0001101000101000': 14, '1100010011010101': 1, '110001110110001
1': 20, '1110001001010010': 1, '1010000111011010': 1, '1010111010101111': 1, '000111
0010011101': 10, '0010110100001111': 1, '1111110110010101': 1, '1011111000111101':
6, '1001011101001001': 3, '1100111000000001': 5, '1000100100100110': 2, '11000010010
00010': 8, '1111100010101000': 3, '1010011111111110': 8, '1110100111110110': 2, '100
0101010101000': 5, '1010110010101110': 2, '0011100000101110': 1, '1010010111001001':
3, '0100000011010111': 1, '0000000001110110': 1, '1100000101000111': 10, '0100010101
010101': 2, '1010101010001010': 19, '0011101100111000': 18, '0101010001110111': 10,
'010000111000010': 1, '1010100110111000': 1, '1101100010010100': 1, '00111110100110
00': 1, '1110001011101110': 4, '1100001101100110': 5, '1110010111111011': 1, '111011
1110000111': 6, '1000101100111110': 3, '1100100010000011': 6, '0001111100001101': 1,
'0101100010110000': 6, '1010001010111110': 4, '1001110110000101': 1, '010100101100001
10': 5, '0101010011110000': 1, '1010110011011111': 1, '1000100100101110': 1, '010101
0111100011': 1, '1100001001001011': 1, '0101010111100000': 2, '1110101111100010': 2,
'1100011100000011': 4, '1100000000100010': 3, '0101010101011101': 7, '11100011011000
10': 6, '0100110100100010': 1, '1010110000111110': 1, '1010111010111101': 3, '101010
0100001011': 3, '0101110011000001': 1, '0001110010101000': 4, '0011001101001100': 2,
'0101110000110111': 7, '1100010111110111': 8, '0101011011000111': 5, '11000100101101
10': 1, '0011001010101110': 1, '1001110100011101': 4, '1000011001001011': 2, '010110
1010110000': 9, '1010010101111110': 3, '0101011101110111': 1, '0111100010100000': 4,
'1110000001111110': 5, '0100111000110011': 1, '1011111011001001': 2, '00001101001000
11': 1, '1110011011000011': 21, '1000010101011001': 1, '1100011011110011': 5, '00110
11001111001': 5, '0001101110100010': 1, '0011011111111000': 7, '1100110100110000':
1, '1111101110001000': 2, '0110111010000111': 1, '0001111100001001': 23, '0011101010
011101': 13, '1010001011111000': 8, '1011010111101100': 1, '0110101110111110': 1, '0
011100100011000': 7, '0111000001001000': 2, '1010001001111000': 2, '000100101110110
0': 12, '0100101000110110': 12, '0010111000001001': 2, '1000100100101010': 3, '00010
01111111000': 15, '1100110010010110': 1, '1110010101001001': 1, '0101101000000001':
5, '0111010101010011': 1, '0111110010010101': 1, '0111000011010101': 2, '10101110000
11001': 2, '0101001111101100': 1, '0100111101010011': 1, '1011011001011001': 7, '000
0100010100010': 1, '0101101111010110': 2, '1000100001101010': 1, '0010111110111100':
2, '1101010101010111': 9, '0101100100100011': 1, '0111001011110110': 4, '01010000110
00001': 1, '1000100010001110': 1, '1010001111100010': 4, '0111101010100110': 1, '010
1100110110010': 2, '1000001011110010': 9, '0001000011111000': 3, '0001101110001001':
1, '0011010001101100': 2, '0011000111001010': 1, '0101011001011101': 1, '00111101001
01010': 1, '0010000101110110': 1, '1000101110000010': 7, '0111110100101001': 5, '100
0011111110111': 3, '0101101110110000': 7, '1011000101001010': 1, '1110110010001011':
1, '1000100100010011': 1, '1010111000010111': 1, '1010100000001001': 5, '10101111101
11011': 1, '1000101100101010': 1, '1100110110110110': 11, '0010111110011111': 1, '10
01101110001001': 1, '1100010111000101': 1, '1010010011011101': 6, '011110101011100
0': 13, '1100101100110100': 2, '0011011101011100': 1, '0111100100100000': 2, '000100

1111011001': 2, '1110000101000111': 2, '1001011011011101': 4, '1111001011101100': 1, '1010100111101010': 2, '0111111000001101': 1, '0001101100110100': 1, '0010101010101000': 10, '1101000101000010': 1, '0101011111110110': 1, '0001011011011100': 1, '0001101110111110': 1, '0001110100101001': 4, '1000100100000011': 1, '0011001110011100': 1, '1110000011110110': 14, '0101110001000111': 1, '1111111100011101': 2, '0000101110111110': 2, '1000001011010110': 11, '0111110000000011': 8, '0000100100000010': 1, '0111100100110100': 2, '0000111110001001': 1, '0100111000010011': 6, '1110110010010011': 1, '0010001001111110': 3, '0000001011101100': 1, '0101000101000001': 8, '0101110010000111': 1, '0110100000101110': 1, '1100101010110111': 3, '0111000001011101': 2, '0011100110001100': 8, '0010011001011011': 2, '1010010011011011': 1, '0010111100001001': 4, '1011111110111100': 5, '1010010101101001': 4, '0001010101001101': 12, '0001000011101100': 5, '1011100000111110': 3, '1010101010001000': 6, '1010000001101100': 3, '1000000101110110': 13, '0010001111011110': 3, '0100111110010101': 2, '1010000101011001': 1, '0010110000011111': 3, '1010001011000010': 3, '1000111010011101': 4, '1000101010000110': 1, '0101100110111100': 1, '1000001011111100': 8, '0001001101101001': 1, '1110101110011110': 2, '0110000011100010': 4, '0011111110001011': 4, '0101101010000001': 4, '0011110110101000': 10, '1100000011010010': 2, '0010111110011101': 4, '0110000101111110': 1, '1011000101011100': 4, '0010110010001111': 1, '0100011011100110': 2, '0001101110110000': 1, '0101010101100011': 6, '1100101010010011': 5, '1010101001011110': 1, '1011111010011000': 1, '1010001101101000': 7, '0110001011111100': 2, '1111101010111000': 2, '1010000011101110': 13, '0010110110001011': 4, '1010010111011100': 1, '1000000101111010': 2, '1011011101111101': 1, '0101111110110111': 2, '1011111000011111': 1, '0101000001110000': 5, '1011011011111101': 2, '0101111100001101': 2, '0101010001110011': 2, '0001001010101100': 1, '0100011011110111': 3, '0011011010001101': 1, '0001010101100111': 1, '0101001111110000': 4, '1010011011001110': 1, '1110011101011011': 1, '0001010101111100': 1, '1100100010010010': 1, '0001001011011100': 4, '0101110000000111': 8, '0110011011000011': 1, '0001101010011100': 8, '0011011111001111': 1, '1010000101001000': 4, '0000000011100010': 3, '1010000001011010': 3, '0001010111101001': 2, '1010100110110110': 1, '1001010101001101': 3, '0010001101111110': 3, '0101011101001001': 1, '1010000101000011': 2, '1000101000111110': 2, '0101110000100011': 6, '1000101100110110': 4, '0110000111111110': 2, '0101101100100010': 7, '0101101110101000': 4, '0001001100011101': 6, '1100001111111110': 2, '1010001111011010': 5, '0111101000111000': 2, '1010111110011001': 1, '1010101000101110': 4, '1111011001000001': 2, '0011111001001001': 1, '1100011001000010': 1, '0011110100000011': 1, '1000100110000011': 1, '1100110010100011': 9, '0101000011110010': 2, '0111010001111100': 1, '1101001011000000': 1, '0111011001011101': 12, '0111100100011100': 2, '0010110110101010': 2, '1010110000101000': 2, '1101001101110000': 1, '0001100110110100': 2, '1010001111001001': 3, '1110001011011110': 1, '1011010000111100': 1, '1100100000000111': 9, '0100011111010101': 1, '1110000011000010': 3, '1111011111010101': 2, '0111101110110100': 4, '0100000001000010': 5, '0101001001110110': 4, '1100000111010010': 2, '1000010001011001': 2, '1001001111110100': 2, '0010101010011110': 3, '0101011011001001': 3, '1100100101100010': 4, '1100101000100110': 15, '1110000011101000': 2, '0001011011011001': 3, '0101010001110101': 21, '1011001110101000': 1, '1110101000100010': 9, '0000101010100010': 6, '1110000001101000': 3, '1110110110100011': 2, '1010110100111110': 2, '0101000111100110': 3, '0001010110011101': 1, '0111011101000111': 1, '1110110000001001': 2, '0010011101101011': 1, '1010101110111000': 8, '0111011101100001': 2, '0110001111110110': 8, '1100101110000111': 2, '1101001111100000': 5, '1000101100101000': 1, '0000101010111110': 6, '1010000100111110': 1, '1010010101010011': 1, '0010101110101110': 3, '0100101110000011': 4, '1010101100111000': 1, '1011000001111110': 1, '0101111000010111': 23, '1110011011000111': 2, '0010100110111100': 2, '0011100111111010': 1, '0101110010010100': 1, '0101000101010110': 3, '0111010101101001': 6, '1000011010110010': 1, '0011000001011000': 4, '1100110000000101': 6, '0100111101010111': 2, '0101000011000000': 2, '0001110100010111': 4, '0111011100000011': 1, '1110011101100011': 1, '0111000111001000': 5, '1001010001011101': 4, '0101100100010100': 3, '0011111110001111': 1, '1010010100011101': 1, '0001110000100111': 1, '0100001011110100': 1, '0000000101000011': 1, '0011110101001001': 7, '1010011011010111': 4, '111111

1110010101': 1, '1010001111011011': 1, '1001100100111100': 3, '11000110100000011': 1,
'1010111010111010': 5, '0100111010110110': 5, '1001110100010101': 3, '10000110010000
11': 11, '0011001110011101': 1, '1110100100110010': 4, '0101010001001001': 4, '10111
01100001000': 1, '1100100011110010': 1, '1010100101101010': 1, '1010001101011010':
2, '1010101010011100': 8, '1000001101010110': 1, '0110001111111110': 1, '11000100000
00111': 1, '1011001001011001': 1, '0001000001110000': 1, '1100000111111110': 1, '010
1111100010011': 4, '1000001111011110': 1, '0001111100101001': 1, '0100010101100011':
9, '1101111100010101': 6, '1011111000101001': 2, '0111101010010000': 1, '10101010101
00110': 2, '0101101100000011': 3, '0011010000111001': 1, '1010011101111111': 2, '111
0101110101010': 13, '1101111110000001': 8, '0011110100101101': 6, '011100101100100
1': 2, '0101100000110101': 3, '1010110000111001': 2, '1010111010111000': 1, '1001000
101101000': 5, '0001010001001101': 11, '0111111110110110': 1, '0010011101011111': 2,
'1100000011110000': 1, '0110001111101110': 1, '1100100100110111': 6, '00100000110011
01': 1, '0101001011110000': 10, '0111010001100001': 2, '1000100100011011': 1, '10101
11100001001': 22, '0101000011101100': 1, '0001100100100000': 1, '1010000010111110':
1, '0010110010011111': 1, '0110111010000011': 2, '1010001001101100': 3, '00000000011
00010': 4, '1000111110000111': 5, '0010111000001111': 1, '0101010101000111': 9, '011
1011111000101': 5, '1011010101101001': 4, '0011010100001001': 8, '1000111011001001':
1, '0001000111100000': 3, '0001001101101010': 1, '0111110100010101': 19, '0111010111
101101': 1, '0010000001111110': 7, '1110100010100110': 1, '1100011001000101': 3, '01
01110110110001': 1, '1000001101000011': 2, '0101100000000011': 1, '101100011101110
0': 3, '1101000011100000': 2, '1000000110001000': 1, '0010110100111111': 1, '1011100
100101100': 4, '1010000011111100': 22, '1010100000011010': 3, '1110111010000111': 3,
'1111011111111100': 2, '0011101100011101': 6, '0010111110001111': 1, '11101101101000
10': 1, '0110110100001001': 2, '1000111010101001': 1, '1010110100010111': 1, '101001
1110111110': 1, '1000110100011101': 7, '1011011011101000': 3, '0101111110100011': 1,
'0010011101001001': 5, '1100111010010110': 7, '0100001011010010': 2, '00010111111010
00': 2, '0000010001011111': 1, '0011011111010101': 2, '0010001011101100': 2, '100000
0101001010': 1, '0101100000010100': 1, '1001001011100110': 1, '0001001111001001': 3,
'0001000001110100': 2, '0101111110100000': 4, '1111110110001101': 1, '00000110010101
11': 1, '0011101100101010': 4, '1100111011100011': 1, '1010101110001111': 1, '110001
1110000011': 5, '1011100100101101': 1, '0011110101011101': 5, '1110000011111100': 2,
'0101001011101000': 7, '0100101101000010': 1, '1010101010111000': 6, '10101010000111
10': 3, '0011100110111110': 4, '0101000001010011': 1, '1100101010010111': 17, '00100
01111001010': 2, '0101001101110111': 1, '1110100010111110': 6, '1100110100010010':
1, '0011001010101000': 9, '0000111010000011': 1, '1010000001011011': 1, '01001011101
10010': 9, '1011011111011001': 4, '0000011111010111': 2, '0001010111001001': 7, '111
0001001101010': 4, '0101100000010011': 1, '1001010011101001': 1, '0000110000000011':
4, '0111001111100010': 3, '1100100011100010': 2, '0011100010011101': 4, '10110010111
01010': 2, '0111001011100010': 5, '1011111110011001': 5, '0111000101100000': 3, '101
0110010001111': 2, '1011011111001000': 1, '1010111010000111': 1, '0011111010111110':
3, '0111101000110010': 1, '1100001101010010': 1, '0101101111010101': 1, '10100000011
01110': 14, '1100000100100010': 1, '1101010011000001': 3, '1010001101001000': 1, '00
01111001011101': 1, '1010110100001101': 8, '0010001101101000': 2, '010000000100001
1': 6, '1111101100010001': 1, '0111101110111000': 9, '0100100110010111': 1, '1101001
111110110': 4, '1111110000101000': 1, '1010111110001111': 4, '1101011101110101': 1,
'1001001001101000': 2, '1000000011110010': 1, '0110011101000001': 1, '00101111000100
11': 1, '1100101111000010': 2, '1110100100111100': 3, '1000101100011100': 1, '110000
0011000000': 1, '1100110110100110': 3, '0100011100000011': 1, '0001110000101000': 5,
'0011101011111000': 1, '0101110110100010': 1, '1101110000000011': 6, '00111111101011
01': 8, '0011101111111100': 3, '1000000001101100': 1, '1000110100000001': 3, '001110
1010001010': 1, '0101110000101001': 1, '0010111010011101': 4, '0101100000100100': 4,
'1010010111001011': 3, '0111101110100010': 8, '1010010101111101': 6, '10110111111010
00': 8, '0101111110010001': 12, '0000001001010111': 1, '0011110010111001': 2, '11100
00011011111': 1, '0001001111100010': 3, '1000100100111110': 9, '1011100100011101':
9, '0101010001010001': 41, '0010101010011000': 1, '0101111111010101': 2, '1010101000

'111100': 7, '1100001011000110': 6, '1100110110100111': 1, '1011010001101010': 1, '1100100111100010': 3, '1000010011011001': 2, '0011010011101100': 1, '0101100110010000': 1, '0011100000111010': 3, '1010111100101011': 2, '0101010001011001': 1, '1000011110000011': 1, '1101101010100000': 9, '0001010000011101': 5, '0001101000001000': 2, '0011100010001001': 4, '1110101110001010': 3, '0010001011101000': 5, '1011101000101100': 2, '0111111010001001': 7, '1000010101111001': 1, '0111010011000101': 1, '0001100000001000': 2, '1011100110101100': 6, '0011011011001100': 2, '1110000101110010': 5, '0101011011000101': 10, '1011111100111101': 2, '0111011111101000': 1, '1101110000010111': 7, '0010110110001101': 1, '1110001001110110': 4, '1000001101101000': 1, '0101100000101000': 1, '0101110101000001': 3, '0001000001001001': 3, '0101001101110000': 1, '0101100100000111': 1, '0010100100111100': 1, '0011011011111110': 2, '1100001011100011': 3, '1110100100001010': 1, '1100101111110010': 2, '1010101100101000': 5, '1110110010111111': 1, '0101010011100001': 1, '0111111110101001': 2, '1000111110011101': 4, '0101101100010110': 1, '1010100110101100': 3, '1100010101110010': 3, '1000101100011010': 1, '1100111001100010': 1, '1010011011001111': 3, '1110001011111010': 4, '0101001111000001': 4, '0101101000000111': 2, '0111100100101100': 5, '1010100010100010': 1, '1111010101000001': 3, '0001101110011000': 1, '1100110100100001': 2, '1100000001000111': 5, '0001001011001000': 8, '0010001011001010': 1, '1000111110001011': 2, '0011001001101010': 2, '1001100000101100': 1, '0011111000111100': 4, '1000101110001110': 1, '0001111110000101': 3, '1110110110110110': 1, '0010011101011101': 3, '0001000111011101': 1, '0111100000110110': 1, '0101000001111000': 2, '0001011001000011': 4, '1011010011111100': 4, '1011110010111101': 1, '0011010011111000': 3, '0011011011001000': 3, '0111001111011001': 2, '0011110100011100': 4, '0101000111101000': 1, '1100000010110110': 4, '0101101010010100': 6, '1010001001011111': 1, '0101100100000000': 2, '0101000111110000': 1, '1010100100011110': 7, '0011001101111000': 13, '1010010011001011': 4, '0000000111111000': 1, '1000000001010110': 1, '0111110100010011': 2, '0000001111110110': 7, '0011110011111101': 1, '1010001101111110': 13, '0100110010010011': 1, '0111010101100101': 1, '0011101000001100': 3, '1110110100100010': 2, '1010010001111110': 5, '0000010101010111': 7, '0011110110101010': 1, '0101100100101000': 2, '1000001001101000': 4, '1001010101010001': 2, '0010100000011110': 1, '1110110000011101': 5, '0101000101001001': 2, '0110010001010101': 1, '0011010101011100': 3, '0101000101010101': 9, '0101110010010111': 6, '1000010101111010': 1, '0100111110000111': 6, '0000111100010011': 1, '1100011101010101': 5, '0001010101010001': 3, '0000011011000011': 2, '0001010101111001': 4, '0001001011100000': 4, '0111010000010001': 1, '1000000011011110': 1, '0101111000110101': 8, '1110110110010101': 1, '0100100110010110': 5, '0100011011100010': 4, '1010011111010011': 1, '1001110000000011': 1, '0001110001011101': 1, '0101101110001000': 2, '0011101100001100': 3, '1001110100000011': 1, '1100111000100110': 2, '1000010111000111': 5, '1000001111111000': 1, '1011100000001100': 2, '0001010111011101': 11, '1110001010110110': 2, '0001110000010101': 8, '1000010101101010': 2, '1011101110101001': 1, '1010001101011101': 3, '1010101010011111': 1, '0001101000111100': 6, '1001000001100010': 1, '0100111100010001': 1, '1000010001100110': 1, '1100001101110111': 3, '1100101110111110': 3, '1010110010001011': 5, '0010100100001010': 2, '0101100100110101': 1, '1000010101000111': 11, '0010000101011010': 2, '1101011111000011': 4, '1101000001110111': 1, '0111010111000011': 1, '1010111000101111': 2, '1100001110010110': 1, '0011010100011101': 5, '1101110100011001': 1, '1110000101010111': 3, '0101111110100010': 2, '0111101110110110': 3, '1110111110101000': 2, '1100010101000010': 2, '0111101000011100': 1, '1010010011101000': 3, '0101111100000111': 6, '1011000101001001': 5, '0101111101110001': 1, '0001001011010100': 2, '1101000001110100': 3, '1010101110010110': 1, '0101010111100001': 3, '0111001010100010': 1, '1000000101111100': 4, '1110011111111110': 1, '1010111110101000': 1, '1110011111000111': 4, '1011000111001000': 4, '1000111100010011': 4, '0110000001000011': 1, '0110001011101010': 2, '0010110000011101': 5, '0100101100100010': 8, '1110111010010011': 5, '0010110000101001': 2, '1001101110100000': 2, '0100110110010011': 2, '1001110110001001': 1, '0011001001111101': 1, '1100101010010001': 1, '1100110000000001': 19, '0101101110000000': 2, '1000110000110111': 5, '1110100100101000': 1, '0010111010111110': 2, '0010010101101011': 2, '1000111100011111': 2, '1100110100100110': 3, '1110110101100011':

1, '0011100101001000': 1, '0101110110000111': 3, '1010000101001111': 2, '00110001011
11101': 3, '0011110000101100': 1, '0101011111100000': 1, '1101000001100010': 5, '100
0110000010011': 9, '0101101010101000': 3, '1111000101111100': 2, '0000001111011101':
1, '0001010101100001': 2, '0011101100001000': 8, '1011101000111110': 2, '11001100110
00011': 1, '1110101110100110': 6, '0100101010000010': 6, '1000011111000111': 3, '000
1101011101000': 1, '1100101010000011': 15, '1000100000000010': 2, '100010010011101
0': 2, '1001111010011101': 2, '0100010101110110': 1, '0001100000101001': 1, '1101011
111110110': 1, '0011111001011101': 1, '0000101010101010': 4, '0001000011110110': 2,
'0010111110001011': 1, '1111111100010101': 1, '1011111100011001': 5, '11000001011101
11': 3, '1101100010110100': 1, '1110110110011111': 1, '1011111110111000': 1, '011001
1101011101': 1, '0010111100001011': 2, '1101010001100000': 1, '0001010101011100': 1,
'1000110001000001': 1, '0011000001101001': 4, '0100101000110000': 1, '000000101111001
10': 1, '0101001101010101': 6, '0011111101001001': 4, '0101000011101000': 1, '110101
0001110001': 1, '0001000101011000': 1, '1011101010110100': 1, '0101000001010001': 5,
'1100011111100110': 8, '1101101110010110': 1, '0101110110010111': 9, '01010010110101
10': 7, '1100001111010100': 1, '0111101010110100': 5, '1000011101110111': 2, '011110
1010100010': 8, '1010001111100110': 1, '0001001011000110': 1, '0011001011100010': 1,
'0100101000110010': 5, '0011101000111110': 2, '1011100100111101': 1, '00111001101010
10': 3, '0110001110111110': 1, '1101011011000101': 3, '1010100011111110': 3, '110010
1011110110': 6, '1100101100010011': 2, '1010011001101010': 1, '0011110000001011': 5,
'1010010101001111': 9, '0000100110101010': 1, '0110101110010110': 2, '01111001101111
00': 13, '0010110101101010': 1, '1000111000010011': 5, '1111010001111100': 1, '11000
11110010001': 1, '1101011011010001': 1, '0111110000111101': 7, '1101010101110111':
1, '1000111100001011': 2, '0100001001100010': 8, '0101100111110100': 1, '00010110010
11001': 4, '0001000101110110': 2, '1000011011100011': 1, '0101100111100000': 1, '100
0010011110111': 1, '1101110100000101': 2, '1101111110011101': 1, '1000000011100110':
2, '0111100110000001': 1, '0010111010101010': 1, '1101001011000010': 1, '01010000111
10000': 4, '0000010101101010': 1, '1010100000101001': 2, '0111010001100010': 1, '111
0100010000010': 1, '0001100011011100': 1, '1110010011010011': 2, '1000010111010111':
7, '0011100100111101': 2, '0101011111110100': 3, '0111010001000011': 6, '00011010100
11101': 4, '0001001101000001': 1, '0011100110001010': 1, '1010111000101010': 3, '101
0101100100010': 1, '1101000001000000': 2, '0011100100001101': 3, '0010110011001011':
1, '0111000101111000': 4, '0001110110001101': 3, '1100010011100110': 1, '01011110101
10100': 2, '0101010000010101': 2, '0101000001100100': 4, '0101100100110000': 3, '110
0111010110010': 6, '1011011001101001': 3, '0111000101011101': 6, '0101010011010111':
7, '0001111000101101': 2, '0001111000111101': 1, '0011000111111010': 1, '10110111110
10111': 1, '1110111010111111': 1, '1111100110100010': 1, '1010000111110110': 3, '011
0100100101100': 1, '0101001011111110': 1, '0101100010010110': 3, '0111011001010011':
1, '0101101110000101': 2, '0110010101110111': 1, '0001111010111100': 4, '11101001001
00011': 1, '0111000101001000': 4, '0011010001011111': 5, '0111000010111100': 1, '110
1111000010001': 1, '1011010111011101': 4, '0001001011101110': 1, '0001010100001001':
2, '0101101100100000': 1, '1010111010011110': 1, '1001111110001001': 3, '11011100001
00101': 1, '0101111010111101': 1, '0111001001110010': 1, '0101100100000010': 2, '010
0011011110110': 4, '1110111000000111': 2, '1000000011111100': 2, '1010100000001011':
2, '1100000010100010': 1, '0101011011100100': 2, '1100010100110111': 2, '11100111110
00001': 1, '1101101010000100': 1, '0110011111001001': 1, '0001010111000101': 1, '010
0000001010111': 6, '1000100000111110': 4, '1010000101011010': 3, '1000110001010011':
2, '0101101011100000': 1, '1011011011101010': 1, '1100001011010100': 1, '00011000101
11000': 2, '1001111100100011': 1, '1000010101011111': 5, '0001010011000011': 1, '101
0001101111010': 4, '1110001111001110': 1, '0100010100010111': 1, '0100010101010111':
6, '1110010001111011': 1, '0101101100110100': 6, '0001011111111000': 2, '00001111001
10011': 1, '1100011101110011': 5, '1100010111010101': 4, '0111101010000001': 1, '001
1111110111000': 5, '0010010101011101': 7, '1010110000111010': 1, '0111011111111101':
3, '1101110000110101': 1, '1011011001111101': 2, '1010100100011111': 3, '11001111010
10111': 5, '1011010111101000': 5, '0011010101101011': 1, '0000010101000111': 1, '010
0110010000011': 5, '1001001101001000': 1, '1010001011100110': 1, '0000101000001000':

1, '0111001011000001': 1, '1101100000100010': 1, '0101010011011101': 2, '10011011000
11101': 1, '0110101010100110': 1, '0111001111001100': 1, '0001101010101110': 1, '111
0010110001011': 1, '0101001011000100': 2, '0111110000100001': 4, '1100100010010011':
11, '1010100100101100': 1, '1101101110100000': 4, '1010110100111001': 1, '0011110100
010001': 1, '1110000101001000': 1, '1111000101001000': 2, '0110111010010101': 1, '00
01100100011000': 2, '1000010001000111': 11, '1000011111110110': 1, '011100111101010
1': 1, '0111110100101000': 3, '1101100100100000': 2, '1001101010111100': 6, '1100110
010110010': 1, '1110011011010011': 1, '1110111100010011': 2, '1000011001101110': 1,
'1100011111000110': 3, '1000000011101100': 1, '1101111110010001': 4, '01110011110010
00': 4, '1010001101011111': 1, '1011011011011001': 5, '0010011111101010': 1, '111011
1110110110': 6, '1000001011101100': 2, '1110101010011110': 2, '0111110100111101': 3,
'0111010111000001': 2, '1101000001110101': 1, '0001101011111100': 1, '00001111101101
11': 1, '1110110100010001': 1, '0010011011011111': 3, '0100110010100010': 1, '001110
1000001000': 13, '0111110110100000': 1, '1011101010001001': 4, '0111100000000001':
4, '0101010101010011': 7, '0100100110000010': 1, '0000010011110111': 1, '11010011111
00010': 4, '1110101000010111': 1, '1010000101011100': 1, '0110100000100110': 4, '011
0111100010111': 1, '0001010001101001': 6, '0101101110000010': 1, '1000110000110101':
1, '0101101100110110': 3, '0100000111110010': 2, '0011101110011001': 2, '11000010110
00111': 1, '1000111100110011': 1, '0011101100001101': 2, '1110110001000011': 2, '001
0000101111110': 5, '1000101110001010': 3, '0110101110100010': 4, '1000110100100011':
3, '1100101010111110': 1, '0001000001111110': 1, '1010001111011111': 1, '00111000100
11000': 5, '0001111000000101': 1, '1110011101000111': 1, '1010011011111100': 2, '001
1011110011001': 1, '1111010011110111': 1, '0111010001000101': 1, '1100000101100011':
3, '1111110100011001': 1, '1101100100000001': 2, '1100100011110110': 4, '01101100000
00011': 6, '1100001110000010': 2, '1001000011111000': 2, '0001000011001000': 2, '111
1100000101000': 2, '1000111110010101': 1, '0001111010111101': 5, '0101110100110111':
4, '0100100100000110': 1, '0101011111010011': 5, '1010101010001110': 5, '01010111011
00001': 6, '0101111110000111': 10, '0001000101101100': 3, '0111111010010111': 2, '01
00001001010111': 1, '1100001111100011': 4, '1010010101000011': 5, '001111110010100
0': 7, '1010111010001111': 3, '1110111010100111': 1, '0010100000111010': 2, '1100101
110010011': 1, '1010010001011110': 3, '1101001101100000': 3, '1001011111101000': 1,
'0000111010010111': 1, '1110011011000010': 1, '1110000001111100': 3, '10101100100010
01': 5, '0111001111100000': 8, '1110000100100010': 2, '1110000101111110': 2, '001010
1010100010': 1, '1100110101000111': 3, '0101001011101100': 4, '1010000101001011': 7,
'0010101000001010': 1, '0011000001111101': 2, '0110111010010111': 5, '010100110111101
00': 2, '0011011010111101': 1, '0101000011010000': 1, '1100010101010010': 1, '000100
0101101110': 1, '0100100010100110': 3, '0010100000101100': 1, '0011010011101001': 5,
'1000011011100010': 5, '0001100010011100': 3, '0100111010100011': 3, '11011000001101
00': 1, '0011101000001001': 11, '1110000111011110': 1, '0011110000011111': 3, '10000
11001001001': 1, '1110100000011110': 1, '1000001111000011': 4, '1110110000011111':
2, '1010010011111001': 1, '0111011011000001': 3, '0101011001110111': 1, '10100010010
01001': 1, '1111010001010101': 1, '1100010111010110': 1, '0011001110101100': 2, '010
1111110100001': 6, '1000011011101001': 2, '0101101110010110': 7, '1011111010101000':
4, '1111111000000011': 1, '0010001101101010': 7, '0101111110100100': 2, '10001101101
01000': 1, '0011000011101001': 3, '0101001010110100': 1, '1100001011010010': 8, '110
1110110000001': 3, '1011000101001100': 1, '1011000011101101': 1, '1010100010011110':
6, '1010001101001011': 1, '1010101010001101': 1, '0101000101000010': 1, '11001110101
00111': 5, '0111110000100011': 2, '1100011010010111': 6, '1100101011110100': 1, '010
1011100010101': 1, '0101110010100001': 2, '0100101011100010': 1, '0001101010110100':
4, '1100100100100011': 5, '1000101000100110': 1, '0001011101111101': 5, '10101100000
10111': 5, '1000100000100110': 2, '0111010001110111': 3, '1010100101111110': 4, '000
1111110111000': 2, '1101010101000111': 1, '1010000001001110': 2, '0101000101110001':
1, '0001101110011101': 3, '0001010001010111': 3, '1000111110100110': 2, '11101111000
11001': 1, '0100010001110110': 4, '0001101000101100': 1, '0011010001001011': 5, '101
1001001111000': 1, '0111101110101001': 1, '0011010000111100': 1, '0101111110100110':
1, '1011000101001011': 1, '0000101110100110': 2, '1101111000100001': 1, '00011010001

00000': 1, '0010000101011100': 1, '1101010001010011': 4, '0100100000010111': 3, '011
1011001010001': 2, '0011011000111101': 1, '1011110000111001': 2, '1010011001111110':
1, '0111101000100010': 1, '1100001101000010': 7, '1011000001011001': 1, '11011100000
00111': 1, '0001100100110010': 1, '0011101110101110': 3, '1010011111111111': 2, '001
1010111001000': 4, '1100001101111110': 1, '1111001011110110': 1, '1110101100000010':
1, '0111111010000011': 2, '1100010011000010': 1, '1000010011001011': 1, '00000100011
00011': 1, '1010110001001011': 1, '0010011011111111': 1, '1010110100111111': 1, '100
0010011100011': 1, '1100000010100110': 1, '0001110000111101': 4, '1110111110100010':
2, '1000101010011110': 1, '0111001011111110': 1, '0000011011011111': 1, '11000000011
01010': 1, '0101101111110100': 2, '1010010001011100': 2, '1011101110011000': 1, '000
1011011111101': 3, '1110000001010111': 1, '0001101100100000': 1, '1001001011011100':
2, '0011000101101001': 3, '1100010001010001': 3, '0100110100110110': 1, '00101001001
00110': 1, '1100001010110010': 1, '0011010011101010': 2, '0001110101000001': 1, '111
1100001101000': 1, '0111111010001101': 2, '1101011111100010': 2, '0111001001101000':
10, '1110100100000011': 1, '1010001011110110': 4, '1010001101001001': 3, '1111101110
101000': 4, '1010110110110110': 1, '0101101010010110': 9, '0111100110110100': 1, '10
10000001001001': 3, '0011100011111100': 5, '1011010011011001': 1, '010101010111110
1': 1, '0110111110000010': 1, '1010100010001010': 2, '1010101110011101': 1, '0111000
011111000': 2, '0101011101110101': 7, '0000101000100010': 2, '1010010100101000': 1,
'0000110010010011': 1, '1110010111111100': 1, '1010000111111000': 2, '11011010101101
11': 1, '1011011101011001': 2, '0100001001000011': 2, '0001101000011101': 1, '100101
1101000001': 2, '0101111110110100': 2, '1101000011010100': 1, '1101001111111100': 2,
'0111001111110110': 2, '1010111010111100': 2, '0011000101101010': 9, '10101100000100
11': 1, '1110010101110011': 2, '0000011111100010': 1, '0101100110100100': 3, '110011
1000100010': 7, '1011111000011001': 5, '0100010100010011': 1, '1101101110010100': 1,
'0110110100110110': 1, '1110100000000010': 3, '1000111010110110': 6, '10110001011011
01': 1, '1000111110001001': 1, '1110010101100011': 5, '1101100110010100': 1, '001111
1010101101': 4, '0110001111010110': 2, '1011001111011101': 2, '0111101110110000': 2,
'0011010100011001': 1, '1000010111111110': 2, '0010101110111010': 1, '10001011100101
11': 1, '1101110110000011': 1, '0000110000011101': 1, '1101110001000001': 1, '011101
1011111100': 2, '0110110000000111': 1, '1101111010010111': 5, '1010000011101100': 6,
'0111101100001101': 1, '1100001000110110': 1, '0101111010100101': 4, '11000110111101
01': 1, '1110000111010011': 1, '1101100100100010': 6, '1101111010100010': 1, '011000
0111100010': 1, '1001110110011101': 2, '0101001001110100': 5, '1010000011111010': 1
0, '0111011001011001': 3, '0110110000100010': 1, '0011001111111110': 16, '0111001111
011101': 3, '0011100010001111': 1, '0101101000110100': 2, '1111001011101000': 8, '01
01010111001001': 1, '1110011111111101': 1, '0101101100110010': 1, '110010000010000
0': 3, '0101000101111000': 1, '0111110000010011': 1, '1110000111100110': 3, '0011011
101101100': 1, '0111010101010111': 4, '1101000001010111': 1, '0001100100001001': 4,
'1110001001110010': 2, '1000000000110110': 1, '1010011111111010': 2, '10001111101000
10': 2, '0101000011010101': 3, '0000110100001001': 1, '0111011011001001': 8, '111000
0101010110': 2, '0001110100100111': 1, '1101001111010101': 1, '1000101111101010': 1,
'0101000101100110': 3, '0100010100000101': 1, '1101101110100010': 9, '11100010101100
10': 1, '1011000011101100': 6, '1000001101001011': 1, '1000010101001001': 2, '101110
1010001100': 3, '0000010101100011': 1, '1101100100110110': 1, '0101000111010100': 1,
'0001001101111110': 1, '1010001111101100': 11, '0001101110110110': 1, '0101010101100
101': 3, '1101111000010111': 2, '0101101110011100': 2, '1011011101001101': 5, '00011
00110100110': 1, '1010100100111000': 5, '1101011111010001': 1, '0101000101110111':
1, '1001100110110100': 1, '0111100000110100': 1, '1101000111000000': 1, '10000110111
11110': 1, '1001011111010101': 2, '0000101110101110': 1, '0001001010101000': 1, '001
1101011101100': 2, '0101111000110100': 2, '1101101000110110': 1, '0001001111101010':
2, '0111011001010101': 5, '0001110100101000': 2, '0100000001010101': 1, '01010010011
00001': 1, '1101000101000001': 3, '0001011111011001': 3, '1101000101010101': 1, '001
0011111101110': 1, '1010101110001110': 5, '0101100000000010': 2, '0001101100011100':
1, '0111101110011110': 1, '1010011111011011': 4, '0011101010011110': 2, '10110010001
01000': 1, '1100010100000111': 2, '0100011111110110': 2, '1110101110000110': 1, '111

1001011100000': 1, '0010110100101011': 1, '0010110100001010': 1, '1100101100000001': 1, '0110000011110110': 3, '0111001111011000': 2, '0100101110000110': 3, '0100011111000001': 1, '1000001101100110': 1, '1010001111001011': 1, '0101100000100110': 2, '0111010010000001': 1, '1101000111100010': 1, '1010100010101100': 3, '1010001111111000': 7, '0011011011001011': 2, '0010110100010111': 2, '1101101110110010': 1, '1010011101011001': 2, '0000101010100110': 2, '0000001011100010': 6, '1010110100011010': 1, '0011101110111010': 3, '1100010011110101': 1, '0110101010100010': 8, '1010101100101100': 2, '0110101110100110': 1, '0100111010100010': 6, '1101001111000010': 4, '1001011111011101': 3, '1000001011001000': 1, '0011100010101010': 6, '0111010100001001': 1, '0010111010111101': 2, '0111010001001101': 5, '0001000111011000': 1, '0011101100001010': 1, '1000000101010111': 4, '1001010011001001': 1, '0101001001100000': 5, '1001111010000101': 1, '1000100000000011': 4, '0111100000001010': 1, '0111101100010101': 1, '0001001111110110': 3, '1101001011001000': 1, '1111011001001001': 3, '1010101010011010': 4, '0101011010000001': 2, '1110010011001011': 2, '0101101010100001': 4, '1101100100100110': 1, '1001010101010111': 1, '0100110010100110': 2, '1011111101011001': 1, '0001100110011000': 1, '1011010111011001': 1, '0111010011000001': 1, '0001111110100011': 1, '0110100100110010': 1, '0001010111111101': 1, '1010100000000111': 1, '0110100110100010': 1, '1001111000000101': 1, '0001010101010011': 2, '0100011011100111': 1, '1110111100011111': 5, '1100110101110111': 2, '1000010111100010': 1, '1010001011011010': 4, '0001101010000010': 1, '0100101000000011': 1, '1111110000001001': 5, '1101001001010101': 1, '0001101110010101': 1, '1011001011111110': 4, '1010001001101000': 5, '1000101011110110': 1, '1111110110110101': 1, '0111010001101001': 6, '1011100110001000': 4, '0111010001110101': 2, '1000100100111100': 1, '0011011011010101': 3, '0011000111011101': 5, '0110001011110110': 4, '1110010001101011': 1, '1000110100010101': 1, '0000100010100110': 1, '1010001101100010': 1, '0101101100110000': 1, '0101000101100100': 2, '0001110101101001': 1, '1101111100000011': 2, '1000110010001011': 1, '0010011011011100': 1, '1011101010001000': 7, '1000010101001011': 4, '0011101011011100': 3, '0100111000110111': 5, '0100011001000001': 1, '1101111010000011': 2, '0111000011011000': 1, '0101001111110111': 1, '1100011011000101': 2, '1100001011100111': 1, '0011100100101001': 4, '1110011011100111': 3, '0111000011101100': 5, '1110101000110110': 7, '0101101010110010': 6, '1100111010000110': 1, '0101101010010111': 1, '1011101000001000': 1, '1000110110001011': 1, '0111101000111100': 7, '1000100110010010': 1, '1111111000101001': 1, '0001011101010111': 1, '1000101010100000': 1, '0101110100111101': 1, '0001000101010101': 3, '0011010000011001': 3, '1000101010111010': 2, '1111000011111100': 3, '0101000001110001': 1, '0111010101101101': 1, '0101111001010111': 1, '0111000111111110': 1, '0011001101101100': 10, '1110111011000011': 2, '0011001110001000': 1, '0111110100111111': 1, '0110101100110110': 1, '1101010001101001': 1, '0000100110100010': 3, '1000011011000111': 5, '0100001011110010': 12, '0111111010100101': 1, '1110010011110111': 2, '1000010101011101': 4, '0111101010100100': 1, '1010110100101001': 6, '0001001011010110': 1, '0001010101000011': 6, '0111011111010111': 4, '1010110100110010': 1, '1000010001000001': 2, '0101011001001101': 1, '0011111000011011': 1, '1000010001100011': 9, '0001111010110110': 3, '0100100010000110': 1, '0010001011111000': 2, '1011111100011111': 1, '1110000111010110': 1, '0011110000010101': 1, '0001100010100010': 1, '1001000111011101': 1, '0101001111111000': 1, '0010000111111000': 1, '1110011101011111': 1, '1100101000110111': 3, '0110001011100110': 1, '0111100000100010': 1, '0101000001101000': 2, '1001111010001001': 1, '1001010001010111': 1, '1010000010101010': 2, '1101001011010100': 1, '0100110110000111': 4, '0000111000000011': 2, '1100100110100011': 1, '0101011001100111': 1, '0111011011101101': 1, '0101011001100011': 2, '1101000111110010': 1, '1100100100110100': 1, '0110110100000111': 1, '1010100100000010': 1, '1100000000110110': 2, '0011010111111101': 4, '0010101010001010': 1, '1100110100110001': 1, '1110011011110111': 2, '0000100100101010': 1, '1100010001100110': 1, '0010110100101001': 1, '0101100010101000': 2, '1000001111101000': 4, '1111101110110101': 1, '0000101110111010': 1, '1100010000110111': 1, '0011001111001101': 3, '0111010011101000': 1, '0101010111100101': 1, '0101001111000110': 1, '1110100110111100': 1, '1100110101110110': 1, '1110001001000010': 1, '0000110110010111': 1, '0101010101110001': 2, '1101001111110100': 2, '1011011011111110': 1, '1010111010100010': 1, '011111

1100000011': 1, '0011111101101001': 1, '0100010011000011': 6, '1010011011110111': 1, '0001011001000001': 1, '1110111110110010': 2, '1101110000100001': 1, '0011100001001001': 1, '1001001111001000': 1, '0111000101000101': 1, '1010111010000001': 1, '0001011011101001': 2, '1011000111101100': 3, '0000000101010011': 1, '0111100000001000': 4, '1100111100000001': 5, '1010000101000010': 1, '1000111000101001': 1, '1110111110011101': 2, '0101000001100001': 1, '1110101110101110': 3, '1100111001000011': 2, '0011001101011001': 2, '1100101000000111': 1, '0011101010011001': 1, '1010101010110110': 6, '1101110000110111': 2, '0111100100000001': 1, '1000101010001000': 1, '0011111100000001': 1, '0011010101101101': 4, '0111010111111100': 1, '0101100000110000': 3, '0000101110001000': 1, '0010111100011001': 1, '1110100010001010': 1, '0010001011111010': 3, '1011111110111001': 1, '0011000110001100': 1, '0001100110100000': 1, '0100001111110100': 1, '0101101000000101': 2, '0110101010111110': 2, '1101111010110000': 1, '0001001111011101': 1, '0101000000110110': 1, '0011111010011100': 1, '0001001111111101': 1, '0101001010101000': 1, '1100001001010011': 1, '1010111000101001': 2, '1100111011100010': 3, '1110111100110011': 1, '0010011001011101': 3, '1100100101110010': 2, '0101110100001101': 1, '1000101110010010': 2, '0001001110101010': 1, '1100101110111100': 1, '1011100110111000': 3, '0011110100101011': 2, '1101111110000111': 1, '1010000011001110': 1, '0011000111001101': 2, '1111100010111100': 4, '0111111000010111': 1, '1110101000101010': 3, '1011101010101110': 1, '1101010101100001': 1, '1010001101101100': 1, '0001000100101000': 1, '1101110100110101': 3, '0000100110111110': 2, '0000011011000111': 1, '0111101100101100': 2, '0111111010011001': 2, '1101110010000001': 3, '0001001110101000': 1, '0111110110000011': 2, '1010110110101011': 1, '0111110110011101': 6, '1010100000110110': 1, '0100101010000111': 1, '0111110100000111': 2, '0101101000110101': 1, '1111101110011100': 2, '1011100100011100': 3, '0101100000010000': 1, '0100110011010111': 1, '1010100000100010': 2, '1111001111010110': 1, '1010000101011111': 3, '1000000110000011': 1, '1110111010110111': 1, '1111100110101100': 1, '0100110110010110': 1, '1100111000000010': 1, '1000111000111110': 1, '1100111001110010': 1, '1000101110101100': 2, '1111001111100000': 1, '0011011001001011': 1, '0110110010010111': 1, '1010101000111010': 1, '0111010001000111': 1, '1100000000110111': 1, '1100110100010001': 3, '1101011011111100': 1, '0011000111100100': 1, '0001001011110010': 1, '1011100000011000': 1, '1000010001011101': 3, '1010000011011100': 1, '1000001101001110': 1, '1001010101010101': 2, '1101101110110100': 2, '0011111110111110': 1, '1110100010000011': 1, '1110100000111000': 1, '0011100000001100': 4, '0001010111011001': 1, '1101111110000011': 1, '1000100010110010': 2, '1010001111111111': 1, '0110001001100010': 1, '1010000001001101': 1, '1000101110111010': 3, '0010100010111100': 3, '1101110110010111': 1, '1011101000111101': 1, '1110001001111110': 1, '0100110110000001': 1, '0101010000010001': 1, '1011100010011100': 3, '1111000101101000': 1, '0001101010000000': 1, '1010111010011011': 3, '1101110000100010': 1, '0001000101011100': 1, '1101001111000000': 2, '0111010101111001': 1, '1000000111110010': 2, '0101000101010100': 1, '0011100111111100': 3, '0011111110001000': 2, '0101100010000011': 1, '0000111100000011': 1, '1011110110111001': 1, '1000100011110110': 1, '1000110000101010': 1, '0101010001011101': 1, '0010000101101000': 2, '1010010011010111': 1, '0011111111101000': 2, '0001111110111101': 1, '0101001001111100': 1, '1101000101101100': 1, '1100111010100001': 1, '0011110110101101': 2, '0011001001011000': 3, '1010011011101110': 3, '1101001011111100': 1, '0101111110100101': 2, '0111011111000001': 5, '1100100000111110': 1, '1000110000001111': 2, '1010001011001110': 4, '1000111010010011': 2, '1010101100111010': 4, '1100000101110000': 1, '0101101010010000': 1, '1100000010110010': 1, '1010011101101001': 2, '1111000001101000': 4, '1010010110001111': 1, '0011011110011101': 4, '1110011011010101': 1, '0111011011110101': 1, '1101010101110011': 1, '0011011101011011': 1, '1000000011010111': 1, '0100100001100110': 1, '1000000101010010': 1, '1101101010000001': 1, '0100110000110011': 1, '0111010100000001': 1, '1100111110000110': 1, '1110011111111100': 1, '0100010111000111': 1, '0110001111000011': 1, '0101000001001000': 1, '1100110100000010': 2, '0000100000111110': 1, '0001010010001001': 1, '0001001111000001': 1, '0110110000010011': 1, '1010001011110010': 2, '0011101111111000': 2, '1110100110101010': 2, '0010001101011101': 1, '0011101010011010': 1, '0111101010001101': 1, '1000111010100110': 1, '0101001011010100': 4, '0101100100001001': 1, '001100111010000

11': 1, '0111000101000010': 1, '0100001110100010': 1, '1111000001111100': 1, '011110
0100100110': 1, '0111001001110110': 1, '1101101010101010': 1, '1011011111111101': 1,
'1010000011001100': 1, '1100011000010111': 3, '1110000001010011': 2, '10101101010010
11': 1, '1100111000110011': 3, '1000010101100110': 1, '0111110000101100': 1, '001010
1100101010': 3, '0111110100010001': 3, '1100011101100110': 1, '1110101100101010': 2,
'1010010111111010': 1, '1010010001101011': 6, '0101000001000010': 2, '00011001000100
01': 1, '1101111010110111': 1, '0011000010111000': 1, '1011010011001101': 2, '111001
1101000001': 2, '1010100100111111': 1, '0011011111111001': 2, '1100010111100110': 1,
'1110001111011110': 1, '1101110000000101': 4, '0101010011110100': 1, '000011001010 11
00': 1, '1010011111011110': 3, '0101010001110001': 2, '1101000011111100': 1, '111011
1010000001': 2, '0111100110001000': 2, '0001011101010001': 1, '1010110000011001': 5,
'1110110010110111': 3, '0001010011101000': 1, '1000001011011100': 1, '11011100000100
11': 2, '0111111000010011': 1, '0001001111001010': 1, '0001011001111101': 6, '010110
0110010100': 2, '0111001101000000': 1, '0110010001000111': 1, '0011101110011110': 3,
'1000110100011111': 3, '1100100110010011': 1, '1110110110000111': 3, '11110110110111
01': 1, '0101000000011101': 1, '0001111110010111': 2, '1010101011101110': 1, '010101
0001110010': 1, '0011000011110110': 1, '0111010011001001': 5, '1100001101101010': 1,
'1111110100001001': 4, '0111010101000111': 1, '1111011101011101': 1, '11011100100101
01': 1, '0111011011011001': 2, '0010100110110110': 1, '0101001001100100': 1, '000100
1111100000': 3, '0001101111101000': 1, '0001111000101001': 1, '0101110111010101': 1,
'1011100000111010': 1, '0101010111010111': 8, '1011011100011101': 1, '00011100000001
01': 2, '1001101000100000': 1, '0011011011111001': 3, '0100001011000001': 1, '011001
0101010011': 4, '0011011101101000': 5, '0101101110010111': 1, '1111000011101000': 2,
'1110100111000010': 1, '0101010111010011': 1, '0100010111100111': 1, '10101101100111
10': 1, '1100110011010011': 1, '0111001101110100': 1, '1100011101110101': 1, '010101
1011100000': 2, '0110111000001001': 1, '1000101010100011': 1, '0100110110110111': 1,
'1000100100010111': 2, '1010101010001011': 1, '1100111101000011': 2, '11111001001010
10': 1, '0101001001110010': 1, '0011111110011111': 1, '0101010110000001': 1, '010101
1111110001': 1, '0001001011001100': 3, '0101010010010111': 1, '1001010011011101': 2,
'0001001101111000': 1, '0111101000010000': 1, '0111011101100011': 1, '11100011111001
00': 1, '0010011011101100': 1, '1000010101111101': 1, '0111010011010101': 3, '111111
1010011101': 1, '1100011101000010': 1, '0100100000010110': 2, '0011100011001001': 1,
'1110001001010111': 1, '1001011111111100': 1, '0101110100101101': 1, '11100100110111
11': 1, '0010101100101110': 1, '0111100100011101': 1, '1001110110101000': 1, '011111
1100101001': 2, '0001001001111000': 2, '0011110001101000': 2, '0101100001100010': 1,
'1010101010001111': 1, '0001010111101000': 3, '0010101110101100': 1, '10101110100011
10': 1, '1101011111100111': 1, '0110111010100010': 1, '1111101010110000': 1, '111011
0100011111': 3, '1000100000101000': 2, '0010101100111110': 4, '0111000011011100': 2,
'0001101010011001': 1, '1000001001011110': 1, '1011101100011100': 2, '010100100101 01
11': 1, '0100000001100011': 2, '0010100000101000': 2, '1100011111010001': 1, '100011
0100101010': 1, '0100100011110010': 1, '0010001001111010': 1, '1001001011010110': 1,
'0001001101011100': 1, '0111010011011101': 5, '0001011001010101': 3, '11100000011001
10': 4, '1100111000110110': 4, '1100101010110011': 1, '0110100000101010': 1, '000101
0011001101': 3, '1010000111010110': 1, '1111000001011101': 1, '1111111010101000': 1,
'1101010101100101': 1, '0010111110101010': 2, '1000011111111100': 1, '000010110010 01
01': 2, '0100111110110111': 3, '0010000101001111': 1, '1010011011110110': 1, '001010
0000001010': 2, '0010111100011111': 1, '1000011111101010': 2, '1100101000101000': 1,
'0110100100100010': 3, '0101011011000010': 1, '1101110000010001': 2, '00110011011010
01': 3, '1111011011011001': 1, '1100001111010011': 3, '0101011011000110': 1, '110111
0010000011': 1, '1010011011111111': 2, '0011110000011000': 1, '0111110110111101': 1,
'1110111000011111': 1, '1011000101001101': 2, '1110010001011011': 1, '000010100011 01
01': 2, '1000011101001101': 1, '1000010001001001': 7, '0010001111011010': 1, '011000
1101101110': 1, '1100000101010010': 2, '1000011001110111': 3, '1110011001111110': 1,
'0011101100111110': 2, '0111011111010001': 1, '0101000101011100': 1, '10101100100000
11': 1, '1111111110011001': 1, '0001101010100010': 3, '0101100010010100': 2, '100010
1110000110': 1, '1010000000011101': 1, '1000100000111010': 2, '1111100100101100': 1,

'0011110010101101': 2, '1010010011111100': 2, '0100111110100011': 5, '11101111001001 11': 1, '0000001111011110': 1, '0111011001100001': 1, '1110011101011001': 2, '001111 0010101001': 3, '0011100101001101': 1, '0010000011101110': 3, '1011000011111000': 1, '1100101110100000': 3, '1000011111011001': 1, '1010100000101011': 1, '11001110111101 10': 1, '0100000101011101': 1, '0011001011111010': 3, '1011110000101101': 1, '010011 1100110111': 1, '1000010001110101': 1, '0010010101111110': 1, '1111001111101100': 1, '1100000011101010': 1, '0110000101100010': 2, '0101001111010100': 6, '010101011100011 11': 2, '0101000101110000': 4, '1100100000101000': 1, '0001011111101101': 2, '111110 0100111100': 1, '1110101100100110': 1, '0001100000100000': 1, '0101011011110110': 4, '1100110110010010': 2, '1001101110011101': 1, '0101010001101001': 1, '11011001110100 11': 1, '1100000101100100': 1, '1101100000110101': 1, '1001110000101001': 1, '010111 0001000001': 2, '0001011111100110': 1, '0010010101001011': 7, '0011111100001000': 1, '0100001111010010': 1, '1010110110011101': 7, '0111011101110101': 2, '01111011101111 10': 1, '0011010101101100': 1, '0001011111111101': 1, '0001111110000011': 2, '100100 0111101100': 1, '1000011101001010': 1, '0000001011101010': 1, '1000101010111100': 4, '0011010101010011': 1, '0101111000100001': 1, '0111001101011101': 1, '00101100101110 00': 1, '1110101110010010': 2, '0010100100011110': 1, '0101011101000111': 2, '101010 1100011110': 1, '0001100000001001': 3, '0001001001001011': 1, '0100000001000111': 1, '0010000101111000': 1, '1001011001001101': 1, '1010101010011000': 2, '00111000000010 10': 1, '1000111010110010': 1, '1011110001011101': 2, '0100000101010011': 1, '110010 0010110100': 2, '1110011101101010': 1, '0111001111101010': 3, '1110111110100001': 1, '0010000011111100': 3, '1110001011111000': 2, '0101100000000000': 2, '01110010011000 10': 1, '1001101010110110': 1, '0101000111000000': 1, '0011100000010111': 1, '011110 1100111000': 2, '0111010001100111': 1, '0010100000001011': 1, '1011100000101001': 1, '0000100000110010': 1, '0001100110011101': 1, '0001111110010001': 2, '10101000100111 01': 1, '1011111000101100': 1, '1101000101110110': 3, '1100001111111100': 1, '001110 0010011001': 3, '1110010111100011': 1, '0010101000101010': 2, '1100001001000111': 1, '1010011011111101': 2, '1000100000000110': 1, '1010100000011001': 1, '11010100010001 11': 1, '0001001011101010': 3, '0110010101100010': 1, '0011011100001001': 1, '000111 0000000011': 4, '0011011010111100': 1, '0011001111101110': 1, '0101010011110101': 3, '0001011111000101': 1, '1000100000010111': 2, '0011100000111101': 2, '10100001011011 11': 1, '0101110110000101': 3, '1100000111011010': 1, '1001101010100000': 1, '010010 1110101010': 2, '1000100110010011': 1, '0111011101010010': 1, '0111101010011000': 1, '0110011011010111': 3, '1011101001101000': 1, '1010011011101011': 1, '01110000010000 01': 1, '0111110001001001': 1, '1001110100101001': 2, '0001111110001000': 1, '110010 1110110100': 3, '0010111100101010': 1, '1010111010001010': 1, '1100010101110101': 1, '0101011101100000': 1, '0000101000111010': 1, '0101000001000000': 1, '01000101111101 10': 1, '0011001101011000': 2, '1100100000110011': 1, '1100010001000010': 1, '010100 0001100110': 2, '0111001111100110': 1, '0011100001001000': 1, '1101001011100100': 1, '1110001001100110': 1, '1100100110010010': 1, '0001001011100100': 1, '11000110110100 10': 2, '0001101010000001': 1, '0010110000111011': 1, '0111111010010001': 1, '100001 1101011101': 2, '0101110000110011': 2, '1011000111011000': 1, '0001110000111001': 2, '0010011011011101': 2, '1111101110100010': 1, '1110100010111100': 2, '11110101110001 11': 1, '1000111000011101': 1, '1000110000010101': 1, '1100100000001000': 1, '011000 0001100010': 2, '0101010001100101': 1, '1111110010001001': 2, '1110110000001111': 1, '1110100000101100': 1, '0001110100100011': 1, '1011001001110110': 1, '11100001011011 00': 1, '1001011101010001': 1, '0000000001101010': 1, '1101101000010111': 1, '100010 0011111100': 1, '0011100111011100': 1, '1011110001011001': 1, '0010011111101011': 1, '0001010011000001': 1, '0111010011001101': 1, '0001111000001101': 3, '10111110000010 00': 1, '1011100100001001': 5, '1110101010001100': 1, '0010111000011111': 2, '010001 1101010011': 4, '0011010010101001': 1, '0101000000100010': 2, '0010110100001101': 1, '1110111000101011': 1, '0011000011101110': 2, '1000111110100111': 1, '01111010000010 01': 2, '1100010011110010': 2, '1100000101110100': 1, '0111000001001001': 2, '110011 1111110111': 1, '1011101010011000': 1, '0001110000011111': 1, '1000100001010111': 1, '1100011001110101': 1, '1110000011000110': 1, '1110110000100111': 1, '11100000010001 10': 2, '0011001010101100': 1, '0111100000101100': 3, '1101010111110111': 1, '000100

1011110100': 2, '1110000111000010': 2, '0101000111010111': 1, '0100110100110011': 2, '0111011111001101': 2, '1101010101100010': 1, '0011001111111010': 1, '1100101100101000': 1, '0000011101010111': 2, '1011010011101100': 1, '0101111010010011': 1, '1011101110110100': 1, '0100101111100010': 1, '1101110000111001': 1, '1101001011010101': 2, '0010111000011011': 1, '1000001111001010': 2, '1110100000010111': 2, '1000000101010011': 1, '1010110110101010': 1, '0101101000010111': 1, '1000000001000010': 1, '1111100110001000': 1, '1011110010101001': 1, '1010001110101010': 1, '0011110001111101': 2, '1011101110101101': 1, '0101001101000010': 2, '0101001101111000': 1, '1111011101001001': 1, '1111011011001001': 2, '0101100010010000': 1, '0101001011111100': 3, '0001010001000111': 2, '1100101111010110': 2, '0001001111000000': 1, '0111000001101001': 1, '1010101111111000': 1, '1100111011110101': 1, '0001000001000001': 2, '0111010111001000': 1, '1110100110101000': 1, '0000011111000011': 1, '1011010101101101': 1, '0101000011010110': 2, '0100111011000011': 1, '1010111100111000': 1, '1011000001011101': 2, '1110010011110110': 1, '1000101000101000': 1, '0001010011011001': 2, '0001010001010001': 1, '0010001111111010': 3, '0101111000110111': 1, '0011101100111101': 1, '1010011001000011': 3, '0111001101011100': 1, '0101100111110110': 1, '1001101000101000': 1, '1101111100010001': 1, '0101000001010110': 1, '1110000001000010': 2, '0001011001110101': 1, '0111011101000101': 1, '1001000001000001': 1, '1110011111110111': 3, '1100100011100110': 1, '1010100000111000': 7, '1010100101011111': 1, '0000100000111100': 1, '1101000001000101': 1, '1100000001011110': 1, '0011110000011100': 2, '0001110010010001': 1, '0010011001001001': 1, '0000011110010111': 1, '1010011011001000': 1, '1000000111101000': 2, '0111111110010001': 1, '0111011101001101': 1, '1110000011000011': 1, '0001011011110010': 1, '1000100010101010': 1, '1101111010110110': 1, '0101110010100000': 2, '1100000111000111': 1, '1100111100010001': 2, '1111101110100000': 1, '0101000101110101': 1, '1110001011000110': 2, '1010111100000011': 2, '1110010101110111': 5, '1010010101101110': 1, '1001100100101000': 2, '1000111110100001': 1, '1011011111011100': 1, '1110100100011001': 1, '0111111110110100': 1, '0110010101001011': 1, '0000101110010010': 1, '1010000011011000': 1, '1000010000000011': 1, '1100011111011101': 1, '0101100110010101': 2, '1010100110001000': 2, '0010100100101110': 1, '0010101000011110': 1, '1011111001011101': 1, '1010011111010101': 1, '0101011101100010': 1, '1010101011110110': 1, '0101111100110110': 1, '0111111010101101': 1, '0101111000011101': 2, '1100110100010110': 2, '0111000001100000': 1, '1110001110110110': 1, '0100000011000010': 1, '0101010011000011': 3, '1000001100000011': 1, '0010001111110110': 1, '1000111010111100': 1, '0100101100000111': 1, '0001110000101000': 1, '0011011001001000': 1, '0111000111100000': 1, '0001000001011000': 1, '1110111100110111': 3, '1100110010010101': 1, '1110000011001000': 1, '0110011111010011': 1, '1101100000100000': 1, '1110001011010110': 2, '1111110010011101': 1, '0011001010011100': 2, '1100001011000001': 1, '1101011011100111': 1, '0001100010011101': 1, '1001101110100010': 1, '0110101110110010': 2, '0010000101011101': 1, '1101100010110110': 1, '0111111100001101': 3, '0101011111111100': 1, '0001001011000001': 1, '0101010001100111': 3, '1000111110000001': 1, '0101100010010111': 2, '1111101110000010': 1, '1000000111010111': 1, '0100000011101000': 1, '0010001111111101': 2, '0011010111001100': 1, '0011000110111110': 1, '0010101100001001': 1, '1010000001011001': 1, '1000001011000110': 2, '0011000101011011': 1, '0101110110100110': 1, '0100110010110111': 1, '0001001101001001': 2, '0011010001110101': 1, '1010000100101010': 2, '1110110110110111': 1, '1101000011110100': 2, '1110001011100000': 1, '1100011010110101': 1, '1001001111011001': 1, '0010100010101100': 1, '0011110001101001': 1, '0101011101100011': 1, '1011111100001000': 2, '0111001101010101': 1, '1000101010111000': 1, '0001011001101001': 2, '1000100000101110': 1, '1110100100000010': 3, '1110000111011111': 1, '1110011000010111': 1, '1100001011111110': 1, '0000001011110010': 1, '0001001011000000': 1, '0011101010101101': 1, '0001101000000001': 1, '1110111110100000': 1, '1011111110111101': 1, '0100010101100010': 3, '1010101010101011': 1, '1110110000110011': 1, '0110100000000010': 1, '0111111000110111': 1, '1101001001110100': 1, '0110100100000011': 1, '1010010001001111': 2, '1010101100001010': 3, '1011000011101010': 1, '0110100010110110': 1, '0000100010110110': 1, '0101001111111100': 2, '1100011111100001': 1, '1000111110100011': 1, '0101111110011101': 2, '0110011111011011': 1, '0111010011010111': 1, '1010000101100010': 1, '01001110000001

11': 2, '1101111010011101': 1, '0111000101000001': 1, '0101101111100000': 1, '1111010100010101': 1, '0011111000011111': 1, '0100111100110011': 1, '0011101000101110': 1, '1001001011110110': 1, '1000001011010010': 1, '0011000101111010': 2, '1011001111101010': 1, '0001101111100000': 1, '1001101010011100': 1, '0011000101011111': 1, '1010100101011010': 1, '1100110001110101': 1, '1010110110001010': 1, '1100000011111100': 1, '1000101011101000': 1, '0010001010101010': 2, '1011101010011101': 2, '1000000011101000': 1, '1101101010010101': 1, '1110111100100011': 3, '1001110101000001': 1, '1110000001001010': 1, '0100001011000000': 1, '1100011001110001': 1, '0001011011101100': 2, '0001000101100010': 1, '1110010001001001': 1, '0011000001110100': 1, '1111100000101100': 1, '0011000011111101': 1, '1000110110011111': 1, '0011010110001001': 2, '1001010001100001': 1, '1100010000100011': 1, '1101000101010000': 1, '0111011001110101': 1, '1010000101101001': 2, '1100000001000110': 5, '1110000011111110': 3, '1101000101000011': 1, '1111011001010101': 1, '1111110100011101': 2, '1110110100111100': 1, '0010101110011010': 1, '0001010001110111': 1, '1100000011100000': 1, '0010001111111000': 1, '0011010100001101': 1, '1111110100000101': 1, '0101100000110010': 2, '1101001111101100': 1, '0011000111100010': 1, '1100011100110011': 1, '0101111000010011': 1, '1000011001100011': 2, '0111000111110110': 1, '0000000101010111': 1, '1000011001110011': 1, '0101000111110010': 2, '0001011101001011': 1, '1010000011011010': 2, '1100001111000111': 2, '0101010010100001': 1, '0100001011010111': 2, '0101000101111100': 2, '1000010111001011': 1, '1011001111111010': 1, '1100001111010101': 1, '0011010111011100': 1, '0011011101011111': 1, '0011100000111001': 1, '1000000110100010': 1, '0111100100101010': 1, '1110110000111110': 1, '0111101110011101': 1, '1110011001110111': 1, '0011001101111110': 1, '0011000101111001': 1, '1110100110011110': 1, '0001000111101110': 1, '0011111110111001': 2, '1010001110111010': 1, '0100001111000110': 1, '0111000101100110': 1, '1010110100111101': 2, '1010100000011100': 3, '0000000101101010': 1, '0100111010110111': 4, '0101001011000110': 1, '0010010001111110': 1, '1100111011010111': 2, '1100001001100111': 1, '1011011010101100': 1, '1011001101011101': 2, '1100100000100011': 1, '0111010111000101': 2, '1101000001110001': 1, '1000010111010010': 1, '1010010111010111': 1, '1011001010101000': 1, '0001101010111001': 1, '1101110110110101': 1, '1101100100110010': 1, '0100000111010110': 1, '0010111110011011': 1, '0001010101100011': 1, '0100100100000010': 1, '1110010001110011': 1, '0011011111111110': 1, '0101101110110101': 2, '0001101000100010': 1, '0001101010101001': 1, '0111001001101010': 1, '1001010011100000': 1, '0100110000000001': 1, '0010000001111000': 1, '0001011001010111': 1, '1000000111111000': 1, '0100110100100001': 1, '0111001111010110': 1, '1110101010110100': 1, '1100101001100010': 1, '1011101000011001': 1, '1001001101001001': 1, '1001100110101000': 1, '1010101100001101': 1, '0111100000011101': 2, '1011101010001010': 1, '1001010001110101': 1, '1001010001101001': 1, '0001100000101010': 1, '0001110100111000': 1, '1010000011100010': 1, '0001111111001101': 1, '0110001101100010': 1, '0111000001010101': 1, '1100101110100011': 1, '1111110100000011': 2, '0110000101111000': 1, '1001100010101000': 2, '1010101011111100': 1, '1110100100000110': 1, '1011000101111101': 1, '1110011101111100': 1, '1110110100011011': 2, '1000100000110111': 1, '0100010000110111': 1, '0001010111010101': 3, '1110111110101010': 1, '0001010101010010 11': 1, '1011100100110000': 1, '0000100010101010': 1, '0101010111010110': 1, '0100010111100010': 2, '0101110000110110': 1, '0000011111110110': 1, '0001010101110111': 1, '1100110100011001': 1, '0011100011101100': 2, '0100110100100101': 1, '1101110000011101': 1, '0101110100111100': 1, '0101110100100101': 1, '0001010001100001': 2, '1010100000101100': 2, '0111110000110111': 2, '0010001101001010': 1, '0101011001110110': 1, '0111010001101000': 1, '1010001010100010': 1, '1101010101011101': 1, '0011010011101101': 3, '1000001001101110': 1, '0110100000001010': 1, '1000110000110011': 1, '0101101110000100': 2, '1110010101100010': 1, '0000101110111100': 1, '1011101010101010': 2, '0111001001010111': 1, '1110100110101110': 1, '0000110000100011': 2, '0010011001011111': 1, '0000111110000011': 1, '0101000011010111': 1, '0001111111001001': 1, '0011000101101110': 1, '0110010001110011': 1, '0110010111000011': 1, '0001100100100010': 1, '0111001101001000': 1, '0100100000010010': 1, '1010001101101110': 2, '1100000011000111': 1, '0100111000100010': 1, '0010010011001010': 1, '0101000001100011': 1, '1111001011111000': 1, '1111001101101000': 1, '1101001011010110': 2, '0111010001100101': 1,

'1010011111010111': 2, '0001101000011100': 1, '0001010111001101': 1, '01111101001111
00': 2, '0001000011110100': 1, '0111010001110001': 1, '0110111000000011': 2, '011001
0101000111': 1, '0100101011100110': 1, '1101101100100000': 1, '1101000101100000': 1,
'1010111110111101': 1, '0011001101101010': 1, '1011010101001011': 1, '11110111110110
01': 1, '0100000111100110': 1, '1101011011110110': 1, '0011000101010101': 1, '011100
1010110100': 1, '1000000111111010': 1, '1100011101100111': 2, '1010000111001000': 1,
'1010100001001010': 1, '0001000001011001': 1, '1010000001001011': 1, '01100001011101
10': 1, '0111110001010101': 1, '1110110100110110': 1, '0001100110110110': 2, '010101
0101110100': 1, '1100011101010010': 1, '1101111000110111': 1, '0100011110010111': 1,
'0100010101110101': 1, '1110111010011111': 1, '1110110000101111': 1, '00111100001110
00': 1, '1001000101111000': 1, '1101011101000111': 1, '0111011010110101': 1, '101011
1100010011': 1, '1111110000101001': 1, '1010010101101000': 1, '1000010001100010': 1,
'0001000011111110': 3, '1000111110101010': 1, '0101111010000111': 1, '11110110100111
01': 1, '1000001011110000': 1, '1010100010011010': 3, '1100100001100110': 1, '111001
0001010101': 2, '1011100100011010': 1, '1011001111011001': 1, '1000111010100011': 1,
'0101011111011101': 1, '0101110110010011': 1, '0110100000100010': 1, '10110110010011
01': 1, '1101001111000110': 1, '1011000111001100': 2, '1000011011011110': 1, '110011
0111000011': 2, '0000001110111110': 1, '0101100100000100': 1, '1110000111010111': 1,
'1110011001101010': 1, '1110100100101100': 1, '1100011111100000': 1, '11011011100100
00': 1, '1000011111001101': 1, '1101001101010101': 1, '1101101000010010': 1, '000110
0100000101': 1, '0011011010101001': 1, '1100011111001001': 1, '0011100110011110': 1,
'1000000100110110': 1, '1010010101000111': 1, '1000000101001011': 1, '11100001111100
10': 1, '1011011101001011': 1, '1100010110000011': 1, '0001010000011001': 1, '100100
1010101100': 1, '0101000000110000': 1, '1111000111101000': 1, '1011010011011100': 1,
'0011110010111110': 1, '1110000101011101': 1, '0010101110001001': 1, '11010110011101
11': 1, '1011010000001001': 1, '0111110000001000': 1, '0111001001100100': 1, '010101
0000001001': 1, '1100000100010111': 1, '0101011111100101': 1, '1000010111010011': 1,
'1111010101000101': 1, '1110000100000011': 1, '1010010001110111': 1, '001001100111 11
01': 1, '1011101011101000': 1, '0111010011111100': 1, '1010010011011001': 1, '110010
1111100110': 1, '0100011001100111': 1, '0111001001011101': 1, '0101100000001000': 1,
'1101000011000000': 1, '1011100000011100': 2, '0010010011111110': 1, '01011100000111
01': 4, '1110101110111010': 1, '1100010001110101': 1, '0111001011101010': 1, '101001
0000001001': 1, '0001010100011001': 1, '0000100010101110': 1, '0101001101000000': 1,
'1100011001100001': 1, '0101001001000011': 1, '0101001010110110': 2, '10111111001010
00': 1, '0101110100101001': 1, '1101100110000011': 1, '0011101010111010': 1, '110010
1101100010': 1, '0111001001100000': 1, '1001100010000000': 1, '0101000101011101': 1,
'0001111100010001': 1, '0111000101001001': 2, '0011101010111001': 1, '00110001001110
00': 1, '1010010001101110': 1, '1111100100000001': 1, '0101011001110011': 1, '010100
1001000001': 3, '0101010001010000': 1, '0011100110001101': 1, '0001000111010110': 1,
'1100100000100111': 1, '1100010111000001': 3, '1010001111000110': 1, '10111101110111
01': 1, '1101001111010110': 1, '0011111110011110': 1, '1111010111001001': 1, '000110
1000010111': 1, '0101101011101100': 1, '0111010000000001': 1, '1011101111001000': 1,
'0000101010010111': 1, '1000111110111110': 1, '1101011011000011': 1, '10000110011101
01': 1, '1010001101010111': 1, '0010001011100010': 1, '1111011101010111': 1, '101111
0000001000': 1, '1001111110000001': 1, '1011101110011001': 1, '0010010001001101': 2,
'0100101100010110': 1, '1110111100111111': 1, '1000110000111101': 1, '11010101010100
11': 2, '1100110010000101': 1, '0101111010111100': 1, '0001110101010101': 1, '011001
0111001001': 1, '1110110000101010': 1, '0101011001100000': 1, '0001100010110110': 1,
'1110101010001110': 1, '1011111111011001': 1, '1111111000001001': 2, '00111000010111
01': 1, '0100100100110111': 1, '0111100101111100': 1, '1000101010010111': 1, '010000
0001010010': 1, '1000010011001001': 1, '1001010101101001': 1, '1100111100100110': 1,
'1101110000110001': 1, '0001110110111101': 1, '1110111010001001': 1, '10010111011101
01': 1, '1101100010100010': 1, '0110000011111110': 1, '1011000011101001': 1, '111001
0001110010': 1, '0001110100110001': 1, '1110000111000011': 1, '1010111000111011': 1,
'0100101100010011': 1, '0001011001100001': 1, '1010001001001110': 1, '11011011101001
00': 1, '0111011101111101': 2, '0010000001011111': 1, '1100111000110010': 1, '100001

1101100010': 1, '1011011101101001': 1, '0011100100101101': 1, '0001100100010111': 1, '1100111000110101': 1, '0010010101101110': 1, '1001000101011101': 1, '0101011111011001': 1, '1110010101010101': 1, '1111010001110111': 1, '0110010011010111': 1, '0000111010100010': 1, '0001110100010001': 1, '0000000111111110': 1, '1001110100011001': 1, '0101111000110110': 1, '1011101100101010': 1, '0000011001000011': 1, '0001001111010100': 1, '1110000001000111': 1, '0100100100000111': 1, '1000011011011111': 1, '1010110110101000': 1, '0011001101001101': 1, '0101110000100000': 1, '1110001101000001': 1, '0101111110010011': 2, '0001110010010101': 1, '0001011111010001': 2, '0011010111101101': 1, '0001101010100110': 1, '0111100110111000': 1, '1101011111110101': 1, '1000010001101011': 1, '1101111010100101': 1, '0111000010011100': 1, '0111100110000000': 1, '0101110110100000': 2, '1100011000000011': 1, '1000010101001101': 1, '0001110000111000': 1, '0101000100100010': 1, '1000111010000001': 1, '1001111010000001': 1, '0001101000010100': 1, '1001111100001001': 1, '1101010001010001': 2, '1010010101111100': 1, '1010111100010101': 1, '1110011101110011': 1, '1010101100011111': 1, '1100011010010011': 1, '0100100100100011': 1, '0101011010100001': 1, '1011001101001001': 1, '0101001101010010': 1, '1100001100010111': 1, '1000111010011110': 1, '0011110110111001': 1, '1100100010000111': 1, '0111000101101010': 1, '0011000001111010': 1, '1110100010000110': 1, '0110010011000011': 1, '0111110101001001': 1, '0011010101001000': 1, '0110110000010101': 1, '0000011111001001': 1, '1110100100100111': 1, '0101010010010101': 1, '1100100110111110': 1, '0001101010010101': 1, '0110011011110110': 1, '0011010001010111': 1, '0010101010011010': 1, '1100101001110110': 1, '1111001111001001': 1, '1111001011100010': 1, '0001001111100100': 1, '1001100100101100': 1, '1000010101110011': 1, '0111000111110100': 2, '0001110101011101': 1, '1111010001101001': 1, '0101001011010000': 1, '0011001001001100': 1, '1000110010011101': 1, '0001000001110110': 1, '1101010101010110': 1, '1000111000001111': 1, '0010101100111100': 1, '1101100110110100': 1, '1110110100100001': 1, '1011111000101000': 1, '0001101000100100': 1, '1110010001011001': 1, '0011100011011100': 1}
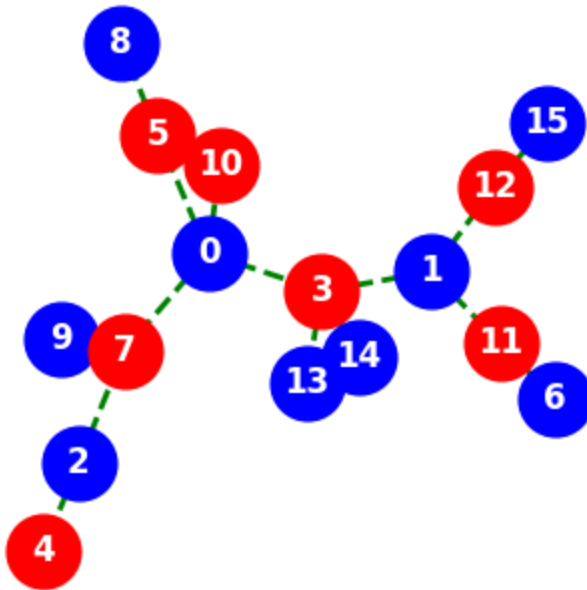
```
In [73]:  # comment this out for challenge 2 and 3

          interpret_solution(T, best_bs_T)
          print("Cut value: "+str(compute_cut_size(T, best_bs_T)))
          print(T, best_bs_T)
```
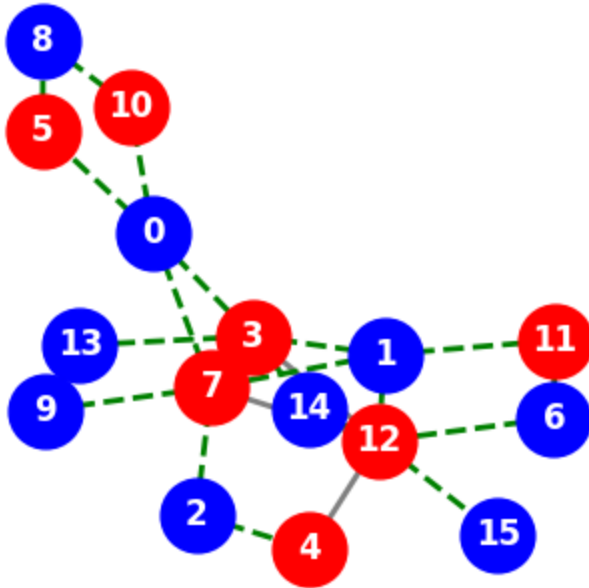


```
Cut value: 15
Graph with 16 nodes and 15 edges 0001110100111000
```

In [74]:
```
# comment this out for challenge 2 and 3

# interpret the same solution, but with the whole graph instead of the tree
interpret_solution(graph, best_bs_T)
print("Cut value: "+str(compute_cut_size(graph, best_bs_T)))
print(graph, best_bs_T)
```



```
Cut value: 19
Graph with 16 nodes and 23 edges 0001110100111000
```

In [75]:
```
# comment this out for challenge 2 and 3

# Sample your optimized quantum state using Aer for the tree

optimized_state_H = ansatz_H.assign_parameters(qit_evolver_H.param_vals[-1])
optimized_state_H.measure_all()
counts_H = backend.run(optimized_state_H, shots=shots).result().get_counts()

# Find the sampled bitstring with the largest cut value
cut_vals_H = sorted(((bs, compute_cut_size(H, bs)) for bs in counts_H), key=lambda
best_bs_H = cut_vals_H[-1][0]

# Now find the most likely MaxCut solution as sampled from your optimized state
# We'll leave this part up to you!!!

most_likely_soln = ""

print(counts_H)
```

{'0010110001100110': 10, '1101111010100011': 20, '0101101101111001': 5, '0111100000110001': 9, '0000111011000011': 16, '1000011011110101': 6, '0011100100101100': 2, '0011000111000100': 1, '1111100000101001': 4, '0111010010111111': 34, '1000101111101101': 2, '0100011001100001': 3, '1100111011111100': 1, '1000111011100011': 26, '0111110001111011': 3, '1110010001100100': 4, '1000111101010000': 5, '1101011000100101': 30, '0010100000010000': 2, '1111100010000011': 7, '1101011010111110': 24, '1101010011100010': 1, '1010110000001110': 2, '1010000111111010': 25, '0000011111111011': 7, '1110010111000110': 1, '1000111011010100': 4, '0101111100001101': 6, '0110110101010100': 1, '0111010000000000': 12, '0010000110101110': 19, '0100001111110000': 1, '1101001100001011': 7, '0111000100110000': 27, '1111000111100101': 1, '1000001001000011': 3, '0101101010000011': 8, '1010110111000011': 6, '0010110011100111': 23, '0101101000100001': 8, '0000101101000001': 33, '0111110100010111': 4, '0111100100001110': 12, '1000001011111001': 1, '0100011000100101': 1, '1011000100011110': 2, '1000111010100111': 11, '1101011011101111': 9, '0000010011110111': 1, '1001101000001110': 1, '1000001101111001': 23, '1001011010000010': 1, '1100011001101111': 4, '1000011000111000': 2, '1101001010010110': 6, '1010110111110010': 1, '1010110001001100': 23, '1010100101011111': 7, '0010000111110110': 17, '0111100110011101': 7, '1010100111011001': 7, '1110110101101111': 2, '1000001111111111': 27, '0001111000001001': 2, '0111010000010010': 29, '1101111010001111': 19, '1010110001110110': 7, '1111100100001000': 18, '0111000111110001': 4, '1010100111100110': 33, '0000000111100011': 2, '0001111000010110': 1, '0101101000111000': 14, '0000101101011000': 26, '0100001100110001': 2, '1000001110001101': 1, '0100111001110111': 1, '1111000100011100': 24, '1010000100110100': 9, '1101101111110111': 6, '0010000100111110': 1, '1011000101111001': 2, '0001101101010101': 2, '1010100011100011': 7, '1110110111110110': 3, '0000011011111110': 34, '0101000101110100': 1, '0001101110011010': 4, '1101001110011100': 10, '1000011111000001': 4, '0110010011011010': 1, '1011100110100111': 2, '1101001100110001': 27, '1101001010010001': 3, '1100011001101010': 3, '1010110111110101': 3, '1010110001001101': 24, '1010100101011010': 7, '1010110001110001': 20, '1101001100101001': 17, '0011000010010010': 1, '0000011010100111': 3, '1101111010001010': 16, '0101001001000000': 1, '0100101101101001': 4, '0010110111100100': 1, '0000001111000101': 5, '0010010010111110': 2, '0101101100011100': 17, '0100011011101000': 1, '0010010011010011': 20, '1101001001110001': 6, '0001011000101001': 3, '0111000101100100': 3, '1101111001110010': 3, '1010110010001011': 10, '0101100100110101': 1, '1111000110110011': 31, '0010100100001010': 2, '1000001001110101': 3, '0000001000010001': 1, '0000101111010010': 29, '0101101010110010': 12, '1101101000011101': 9, '1111100010111011': 6, '1000010011010110': 1, '0101111010011100': 7, '1100111101110000': 1, '0010100111100010': 27, '0110100001000100': 1, '1111000101010110': 4, '0110010001110001': 2, '0101101011001010': 2, '1010110110001010': 4, '0000101111101010': 26, '1100111010011110': 1, '0101101100000011': 4, '1101110010110111': 1, '0010010011000001': 6, '1010000101010111': 4, '0101111000110101': 18, '0010010001001101': 20, '0000011001010101': 24, '0101000110111011': 2, '0000101111000011': 22, '0101101011100011': 2, '0101011110111101': 1, '1111010110001001': 2, '0011100000101001': 3, '1010010111001110': 9, '1110110111110011': 2, '1010100011100110': 8, '0111110000111001': 22, '0000111011011010': 37, '1101011111101111': 1, '0011010001111011': 3, '1111010110100010': 6, '0101111001111110': 2, '1110000101001000': 2, '0011110010001011': 1, '1111010111010011': 1, '1011110000000101': 3, '1000101100101101': 13, '0110010101100101': 1, '1001001010011011': 1, '1101011010011010': 25, '0011001100100000': 1, '1000111000000001': 9, '0111110110001001': 1, '1001101100110000': 5, '1111110010110111': 20, '1101101110001110': 27, '1100011111101111 0': 1, '1001111010110111': 1, '1011010110110010': 2, '0101101011011010': 1, '1001101110111101': 1, '0000101110111010': 2, '0010100101000100': 21, '0000011001001100': 23, '0100011001001110': 1, '1010000001001101': 3, '1101001110100111': 17, '1000001000001011': 1, '1101001110010100': 4, '0000011011110010': 21, '0000111111001010': 9, '0000001011111111': 4, '0110010011010110': 3, '1101001100111111': 9, '0010000010101010 0': 19, '0011110000000110': 1, '0101111011111101': 2, '1010010011111110': 23, '0111000100000100': 28, '0001011000000001': 1, '0101001100011100': 31, '0010010111001011': 4, '0011101011110110': 1, '0000101001000011': 3, '1000001001010101': 3, '00000110110

01110': 25, '1111110110011010': 12, '1100111111000110': 2, '0010110100000010': 1, '1010000101101000': 30, '0010100100010100': 4, '1000111010001010': 12, '1101111000101110': 4, '0010100111010101': 5, '1110110011101010': 1, '1100011010101011': 3, '0111010110001111': 6, '0000110001010000': 1, '1010000101100110': 7, '1011100101011111': 1, '1101101110100011': 28, '0111010010011000': 9, '0010010011001110': 29, '1110100001111000': 1, '0101101101100101': 1, '0111000111011111': 9, '1011110011010111': 2, '1011000100000001': 2, '0000101101111100': 22, '0101101000011100': 8, '1000111001101110': 4, '1000011011000101': 4, '0111010110110100': 2, '1000101011000110': 8, '1111100110101111': 15, '0110100101110000': 3, '0010110000101110': 2, '0111110000100010': 7, '0111100100010001': 22, '0010110110100011': 2, '0110000011110010': 2, '1100101100000101': 1, '0101001000110101': 4, '0000001111110110': 29, '0010100011001111': 7, '0011010001001000': 1, '0000111001010101': 18, '1111110100011000': 4, '0101011000011100': 27, '1010000011010111': 4, '0010110111011011': 8, '0010100101011101': 26, '0110010101010100': 1, '1000101011011110': 8, '1111100111110101': 1, '1011110000110100': 2, '1000101011100010': 4, '0000001001111010': 1, '0010100101100001': 23, '0111000101001101': 4, '1000011011100101': 8, '1101111000100111': 10, '1101011000100000': 20, '1000111101010101': 3, '0110000110000111': 1, '0000011011001001': 4, '1101110010101101': 1, '1111000101001100': 1, '1010000100000010': 1, '1111100100100001': 25, '1101101110101010': 32, '1010000101101101': 31, '1100001101000110': 2, '0101111011011011': 5, '1101011110101101': 2, '0001011001111000': 1, '0101011101011100': 2, '0100011011100111': 4, '1010000010101111': 2, '0111100001011101': 2, '1111000101101100': 2, '1111100101000101': 3, '0111000010000111': 5, '1110110010101010': 1, '1010100010110011': 1, '1000011001110101': 18, '1100011011101011': 5, '0101001000111111': 1, '0011000110011001': 1, '0000001111111110': 23, '1101001111011110': 8, '1111000100111000': 30, '0111000100010101': 26, '1011110001010101': 1, '1111010110111011': 14, '0000001100110011': 1, '0001111100110111': 1, '1101001010101111': 8, '0111010001011001': 4, '0111011100110000': 1, '1101101110010110': 28, '1100011111100110': 1, '0010000111001110': 24, '0100101111110111': 4, '0010000000001110': 1, '0110100101000100': 1, '1010000111011010': 27, '1100011011001110': 2, '0001001111001011': 1, '1010100111110011': 22, '1101011110110010': 5, '1000101111111100': 5, '0011010010000110': 2, '0111010011101010': 4, '0010000101101001': 36, '0000111001100101': 27, '0000011101100111': 3, '0100111011000100': 1, '1101101100100100': 22, '0111000000100111': 1, '1101111001111000': 2, '0000111011111110': 27, '0111100110101100': 5, '1101101110111101': 7, '1111000110111001': 3, '0000100111111010': 2, '1111100000010001': 9, '1101000110100010': 1, '0010110001000101': 27, '0000010010000110': 1, '0000111001011000': 16, '0101001110010111': 34, '0101111010001100': 10, '0001101101100011': 1, '1000001011011111': 3, '0111000000000001': 8, '1111110010011011': 31, '0111000100001000': 23, '0111100100100111': 4, '1000101101110010': 7, '0000101011101010': 9, '0010110111110101': 1, '0000101101101100': 20, '0101101000001100': 7, '1110010011011011': 2, '0010010011111110': 29, '0101011100001110': 2, '0101101110110110': 23, '1011010000001100': 4, '0010010000101100': 24, '0000101100010110': 1, '1110110010101011': 1, '0111000010000100': 1, '1100011011101010': 1, '1000011001110110': 5, '1110110111000111': 1, '1101011001101010': 1, '1111010000100101': 16, '0111110011100100': 1, '1000001100110111': 3, '0101110011101011': 1, '1111010110011010': 13, '0010100100101101': 11, '0111010100111000': 4, '0000001111101100': 4, '0010000010001100': 1, '1111100001010100': 2, '1001101000101010': 1, '1101001100000110': 7, '0111000100111101': 19, '0101101000010011': 4, '1000111001100101': 28, '0000101101110011': 8, '0011000001001100': 1, '1000011011001110': 26, '1111100110100110': 19, '1010000110100111': 5, '1000101011001111': 7, '0111010110111101': 2, '0101011100011001': 6, '0000000101110100': 1, '1111010110011011': 8, '1111110101110101': 2, '1011010000101111': 1, '0101111110111110': 10, '0110100111011001': 1, '0111001110111011': 1, '0010010000011100': 4, '0000101111010110': 15, '1100111010000010': 3, '0101101010110110': 9, '0001001100101000': 1, '1111010011001001': 1, '1110100101001000': 3, '0101111100000011': 3, '1000110011011100': 6, '1010010001101100': 22, '0100011010100011': 2, '1111100110000001': 4, '1111000111001000': 1, '1111010010001101': 5, '0101001011001111': 2, '0000011111000110': 7, '0010010001110101': 22, '0111111001110010': 7, '1111010000110101': 17, '1000011100001001': 2, '1111110000

001100': 16, '1000011000000000': 3, '1010001101011100': 2, '1000111101100100': 11, '1101101000011000': 4, '0101111010100111': 19, '1000101101011100': 31, '1010110011100101': 6, '1011000111101111': 2, '1010000111000001': 11, '1010100101000100': 25, '0010000100111000': 5, '1101101101010111': 1, '0110110101110101': 2, '0101001010111001': 1, '1010010001010010': 4, '1001011011010011': 2, '0101101111111110': 4, '0111110101100101': 1, '0010101101010101': 1, '1110110101110100': 1, '0111110010010111': 16, '1111010011110110': 6, '0111010101010001': 5, '1110100101110001': 3, '1101111011111001': 2, '0010100010101100': 5, '0101011101110100': 4, '0100101110111010': 1, '0010110011010000': 4, '0010001111001010': 1, '1010000001010001': 5, '0111100010100011': 3, '0101101101001101': 4, '0010010010100100': 4, '0111110100000000': 3, '0000101101010010': 7, '0101101000110010': 1, '0000011011001011': 19, '0000101001000100': 7, '1000001001010010': 1, '1010001000110111': 1, '1111100001110000': 3, '0111000100000011': 8, '0101001100011101': 35, '0010010111001110': 3, '0100001111100011': 1, '0000001001101111': 4, '1111000110101101': 8, '1000111110011010': 1, '1101111001101100': 4, '0110010010110011': 27, '1000101111100001': 4, '1101001000001111': 3, '1010100011000010': 6, '1000011001100000': 21, '1000011100101001': 1, '0000111001001100': 33, '1010110101100101': 8, '0010100011011011': 6, '1111000110111110': 30, '0010100100000111': 2, '1101101110111000': 5, '1000001001111100': 7, '1010010110000010': 3, '0101001110001000': 3, '1000011101010100': 6, '0010110110110011': 2, '0111110000110100': 17, '1101011011011010': 6, '1101111010011010': 30, '1010110100001000': 1, '1110000100101100': 1, '1100101011010111': 1, '0001011110100000': 1, '0010110011010010': 19, '0101101101001111': 1, '0001101000000101': 2, '0010010010100110': 7, '1111000011110111': 1, '0010110001000000': 29, '0101001110001010': 18, '1010000101111011': 8, '1101101110111010': 27, '0111100110101111': 34, '1001101100001101': 4, '1000011011010111': 20, '0010010010001100': 5, '0101001110010010': 25, '1010000011110011': 4, '0100001001000000': 1, '0111101100010010': 1, '1001001110001011': 3, '1000101100111010': 3, '0010110001010000': 25, '1101111011010111': 5, '1111000100110100': 15, '0001011000110010': 2, '0001101100010100': 5, '0111000000110110': 1, '0111000100011001': 23, '0111110110100000': 2, '0010011011011011': 1, '0101011000001100': 27, '0100111000110110': 1, '1111110000011100': 8, '1101101110110110': 29, '0111100110100001': 8, '1010000101110101': 22, '0010100100001001': 9, '1101011010010111': 27, '0010110110010010': 1, '1111100100110101': 31, '1101001101010011': 2, '0111000110111001': 8, '1010100110100110': 5, '1111110001100100': 1, '0011100010101010': 1, '1000101110101111': 8, '0101111110101110': 2, '0110101101101001': 1, '0010010001101100': 28, '1111110110000001': 1, '0010100111001001': 8, '0010010011000101': 6, '1010000101010011': 4, '0010110101111001': 9, '0000111110000110': 4, '0101111000110001': 23, '0100011100111000': 1, '1010010011100110': 21, '1101101001110010': 1, '0000001011011011': 5, '0101011001011101': 3, '0000101000000101': 1, '1000001101110000': 29, '1010010011011110': 22, '1111010001100010': 1, '1000001111101101': 8, '0111010100111010': 2, '1010010000100001': 8, '1110110101011101': 3, '1101101101111100': 2, '1000001111010111': 26, '1100111011100111': 3, '0011100010111100': 1, '1000101111011111': 27, '1110000100110111': 1, '1011010010110100': 1, '0100101101001011': 1, '0110100000010001': 1, '0000011010001101': 4, '0110000001111100': 1, '1000011001011110': 3, '0100101111000111': 2, '1111010000001011': 6, '1111100010111101': 2, '0001011100000100': 1, '1101101000011011': 2, '1000101101011001': 20, '0000101111010100': 7, '0001011100101001': 1, '1010100100110100': 4, '1010110001100001': 18, '0100111011100101': 2, '1001001101010000': 1, '1000101000011001': 1, '0111110010000101': 9, '1111010011100110': 4, '1110100101100111': 1, '1100111101001000': 1, '0101111110100110': 6, '0010111101110101': 1, '0010010001100000': 34, '1111110110001011': 4, '1111110000000101': 28, '1101111101011010': 1, '1000011000001111': 2, '0111110011111101': 1, '1111010000111100': 25, '1111110000000110': 12, '1000011000001110': 1, '0101001101100001': 2, '1000001100101111': 4, '0000101000111010': 1, '1111100110010111': 16, '1010000110010110': 4, '0011000100011101': 2, '0000110011101001': 1, '0100111111101011': 2, '0010110111000110': 10, '1000101001010011': 2, '1111010010100100': 3, '1101001000101110': 1, '0010100111110000': 6, '0111000101011111': 1, '1100111011000100': 3, '1111001100100010': 1, '1011000100100011': 1, '1111110011111010': 6, '1110010011101011': 2, '0001101100100100': 4, '11100000010100

11': 1, '1001001100001100': 2, '0010000101001101': 29, '0000111111111010': 5, '00100 00010100110': 3, '0011100110000111': 3, '1101111010100101': 6, '0010110001100000': 2 0, '1110110001100001': 2, '0100001001110000': 2, '0111100000110111': 1, '10101100110 00110': 27, '0000000100110001': 1, '1111110100110000': 7, '0101101000000100': 2, '00 00101101100100': 25, '1000101101111110': 6, '0000101011100110': 7, '001011011111101 1': 4, '0001011110110100': 1, '0101011100000010': 2, '0101101110111010': 18, '011110 0011010111': 1, '0010010011110010': 14, '1111100110010010': 28, '1010000110010011': 3, '0111110011111011': 3, '1111010000111110': 5, '1000001100101100': 12, '0010110011 000111': 31, '1111110000111100': 22, '1010000101011001': 19, '0111010010011011': 25, '0111110111101111': 1, '1000111001011111': 10, '0101011001110000': 15, '011011011101 1111': 2, '1111100111011100': 2, '1111110010100010': 26, '1101100100111000': 1, '010 1011000001010': 10, '0111110110100010': 7, '0001101100010110': 1, '011100000011010 0': 8, '0001011000110000': 4, '0010010011110000': 4, '0111100011010101': 2, '1010000 000000011': 1, '0101101110111100': 6, '0101011100000000': 7, '0111100100101011': 7, '0101111001010110': 3, '1000001110111011': 1, '1110100101001110': 1, '01111100011011 00': 3, '1010010001110101': 30, '1001011010110100': 1, '1101011010101011': 24, '1111 000010101111': 6, '1111100110101011': 21, '0110100101110100': 2, '0110010001001000': 3, '1010000110101100': 2, '1000101011000010': 3, '1000111001101010': 6, '00110101111 01010': 1, '1000011011000001': 4, '0111110000100110': 10, '0111100100010101': 27, '0 010110110100111': 1, '0010110000101010': 3, '1111110010000100': 6, '100010111100101 1': 23, '0001111001110010': 1, '0111010000111001': 23, '1010100111000010': 29, '1111 100100010101': 20, '1011100100101101': 2, '1101101111010011': 7, '1010000100010100': 8, '1000011001001100': 23, '0010001011100110': 1, '1101101100111111': 2, '0111110010 111010': 14, '1101011000110010': 3, '0110010110010110': 10, '1101101111001101': 1, '0111100111111110': 4, '0010010010000101': 1, '0111110110011001': 2, '10011011000000 10': 2, '1000111000010001': 5, '1000011011011010': 29, '1000101011011101': 2, '00101 00101011110': 10, '0001111110010011': 1, '0111010011001001': 1, '0101101110100011': 22, '0011000011110110': 1, '1010000000111100': 2, '0101011000110101': 28, '001010001 1111110': 8, '0111110000001010': 4, '0111100100111111': 3, '0111010010000110': 21, '0011100111001110': 1, '1000001111101000': 5, '1110110101011000': 1, '00000011111011 11': 19, '1000011111101010': 5, '1101101100011000': 20, '1101011000011101': 22, '100 0011110101001': 1, '0000111000111111': 1, '0000110011110011': 1, '1010100011001011': 7, '1111000110100100': 11, '0000001001100110': 3, '0001001110111011': 1, '1000101111 101010': 21, '1101001000000110': 2, '0111010010111100': 10, '0111000101111001': 4, '1100001101011001': 2, '1011000001100000': 1, '0010000101101110': 15, '1010010000001 100': 7, '0101011010101011': 16, '0000011000000000': 4, '0000011100001001': 2, '0000 101111110010': 21, '1111010010000110': 22, '0000011111001101': 7, '000010001000111 1': 1, '1000001111100000': 6, '1110100100010101': 1, '0111010100110101': 10, '111111 0000110110': 9, '0010110011001011': 22, '1111110011011110': 1, '1010100001010000': 5, '1010110011001010': 17, '0001111010001011': 4, '0110010111101000': 1, '1101001110 000011': 18, '1000011011111101': 7, '0000111011001011': 22, '0111100010010010': 7, '1110010101110011': 1, '0000011111100010': 7, '1010000111000111': 32, '0101111010100 001': 10, '1000101101011110': 3, '1010110011100011': 21, '0000111111000111': 8, '000 0011011111101': 5, '1101001110011011': 20, '1110010101001001': 1, '000010110110000 1': 25, '0101101000000001': 10, '0000101011100011': 9, '0111100100101110': 7, '10101 10011111001': 8, '0101101110111101': 6, '0010010011110111': 27, '1101101101110001': 6, '0001111100101001': 1, '1100111110001010': 1, '1000001111011110': 24, '1011111000 100101': 1, '0100101011111100': 1, '1101101100110011': 4, '0111110010110100': 8, '11 11010111001111': 1, '0111000010110011': 8, '0001011010110111': 1, '101011001101100 0': 7, '1111110000100111': 3, '0111100101001110': 1, '1111010010111010': 26, '100000 1111001100': 11, '0011010100000001': 1, '1010010101101001': 7, '1000111011000001': 8, '0110100101001011': 1, '1010000111010111': 27, '0111110100110001': 8, '1101011010 111010': 30, '1111100010000111': 2, '1100111101101000': 2, '0000111111100010': 6, '1 010110000011011': 1, '1010100100101010': 2, '0101101100111001': 20, '011100011111101 0': 4, '1010100111101111': 18, '0000101010010111': 3, '1000001110000100': 3, '010101 1000010101': 20, '0001101010001010': 1, '0010100011011110': 6, '1010110010000011':

4, '0100001111001110': 3, '1101111001111100': 6, '0111000101101110': 2, '11110001101
11011': 35, '0010100100000000': 3, '1000001001111101': 6, '0111100110101000': 6, '11
10010000011001': 29, '0101001010011111': 10, '1000011101100000': 7, '111011001101111
0': 1, '0000111001110111': 8, '0000011101110001': 2, '1101111000111010': 7, '1111110
000001000': 25, '1010100010101110': 1, '1110000100100000': 1, '1101111010010010': 3
1, '0100001111011100': 1, '0101011000001001': 21, '0111000100011100': 19, '110100111
1010011': 6, '1111000001011110': 1, '0000001111110011': 21, '0101001000110000': 10,
'0000101011001011': 7, '0010100101110110': 6, '1101111111101010': 2, '01111101100110
11': 9, '1001011110100111': 2, '0010100011001100': 3, '1000011101000011': 1, '000011
1001010000': 14, '0111010110111100': 4, '1000101011001010': 4, '1111100110100001': 1
0, '1000011011001011': 18, '0101101000010100': 6, '1000111001100010': 7, '0000101101
110100': 23, '0010010001100100': 31, '1111110110001111': 9, '0101111110100010': 3,
'1001101110001110': 1, '1000111010011111': 4, '1010100100011110': 2, '00101100101011
11': 15, '0110000101011000': 8, '1101011010101110': 22, '1111000010101010': 5, '0101
001110100111': 32, '1110010001010100': 1, '1010100100101000': 6, '0011101000000100':
1, '1111010011001100': 2, '0111110001101101': 2, '1110100101001011': 1, '10100100011
10010': 6, '1001011010110011': 2, '0010101101101111': 1, '1101101011100110': 1, '010
1111001010001': 10, '1111000010110100': 4, '1101011010111000': 1, '001101001010111
1': 1, '1110100011110101': 1, '1110000101111100': 3, '1101111110100001': 2, '0101110
110011101': 1, '0011100111011101': 1, '1101101100110100': 19, '0111110010110011': 2
4, '1000011001000001': 19, '1010000100011111': 2, '1101101111011010': 1, '0100111001
011010': 1, '1000101111000000': 3, '1111110010001111': 25, '1010010011100011': 25,
'0100101100111101': 1, '1101101111100110': 5, '0010110101000001': 3, '11111001000001
00': 27, '1000001000101100': 1, '1111010001111101': 7, '1101001100100010': 9, '00110
00010011001': 1, '1100111001011101': 2, '0111010000101000': 15, '0010110010011110':
3, '0001111000000101': 2, '1011100000000001': 1, '1010100111010101': 7, '01000010100
01110': 1, '1010000011110100': 2, '0010110001010111': 4, '1101111011010000': 2, '001
1000110010010': 2, '1000101100111111': 1, '1001001110001110': 4, '1101101111001011':
3, '0010110100101010': 1, '0111100111111100': 2, '0010010010000011': 9, '10001110000
10111': 1, '1001101100000100': 8, '1010110110101001': 2, '1111110010111111': 21, '00
10110100010100': 2, '0111100110100110': 31, '1101101110110001': 6, '101000010111001
0': 6, '0000111011110000': 4, '0110000110010101': 1, '0000001111011101': 2, '1101001
101011001': 3, '0010010011100100': 7, '0101001000011100': 8, '0000001101111001': 19,
'0101011100110100': 5, '1111010011011111': 4, '1000101001101100': 5, '01110101011111
10': 1, '1110100101011110': 1, '0100011001100100': 4, '1100111011111111': 4, '100011
1011100110': 23, '1111000010011001': 2, '1010100100010101': 7, '1010110000001000':
8, '1111000010100001': 1, '1101011010100101': 7, '0111100010110111': 9, '01011011001
01100': 22, '1010110101000000': 8, '1111111000110001': 1, '0000001001010100': 6, '11
01101100011011': 4, '0111010001101101': 5, '1000111101000001': 6, '110100100011010
0': 6, '1101111000110111': 4, '1000011101101111': 1, '1110110011010011': 1, '0000111
001111010': 6, '0000001111011111': 28, '0010010011100110': 21, '1010100111100010': 2
2, '0111000111110101': 2, '0000000111100111': 1, '0010110001111100': 18, '1101101111
110011': 6, '0001001000101101': 1, '1010000100110000': 6, '1111110100101100': 9, '01
01001111101000': 3, '0010010101111001': 4, '0010100001000101': 10, '101011001011101
0': 5, '1010010111100110': 5, '1000000101100000': 1, '1000111100000101': 2, '0111010
110010111': 4, '0011110100000001': 1, '1101011000110011': 6, '0001001010001010': 1,
'1111110000101100': 20, '1000011000100100': 5, '1000001011011010': 9, '0111000000000
110': 1, '1111110010011110': 25, '1111000101000100': 7, '1010000100001110': 3, '0001
001000010001': 2, '1111100100101111': 11, '1111000110001010': 16, '1010010101111111
0': 2, '1101001101101100': 3, '0000011011101110': 27, '0111000110001111': 19, '11010
01101110100': 11, '0000011011010110': 24, '0000001101010100': 23, '111011000001100
1': 1, '0011110000111010': 1, '0000111111011111': 6, '0111100010000111': 5, '1010010
101100110': 3, '1111000110010010': 28, '0000110010001000': 1, '1000111111011110': 7,
'0000011101000110': 3, '1000011101110101': 10, '1101101100001001': 19, '011101000111
0011': 2, '1110110010010000': 1, '0111010001001111': 1, '1000001111011000': 5, '1010
100001010100': 6, '1111110011011010': 6, '1010110011001110': 20, '1101111010101111':

15, '0010110001101100': 22, '0111110110111100': 5, '0010000101000111': 3, '001111000
0011001': 3, '0000111111110010': 7, '0010010110001000': 2, '0101001111010111': 8, '1
101010001111000': 1, '0111100111101111': 7, '1110100111011100': 2, '101101101000011
1': 1, '0111110011011110': 3, '1111010000011111': 10, '0010110011111000': 9, '100111
1001010110': 1, '0111000010011110': 8, '1111101000110101': 1, '1010000111100010': 2
6, '1110000111101111': 1, '0010100110010011': 3, '0000001101000110': 8, '00110101000
11000': 1, '1111000110000100': 4, '1010010101110000': 1, '1111110000010000': 17, '11
01011011111111': 3, '0110000100000101': 1, '1011100110111001': 2, '0101101100111101
1': 19, '0110100100111011': 1, '0101001110100011': 23, '0111010000001001': 27, '0000
011000110101': 5, '0000101110100111': 5, '0000111001100100': 24, '0000011101100110':
2, '0010000101101000': 18, '1100001101011101': 4, '0101001000000100': 4, '0011100110
100110': 4, '0111010010100011': 21, '0111000011101100': 1, '0010110011001110': 27,
'1110100011101010': 1, '1111110000110001': 22, '1011100110011010': 2, '1111010101010
101': 4, '1111010000101111': 8, '1000001100111101': 5, '0101001110111000': 11, '1000
011001111110': 5, '1100011011100010': 2, '0011010010000111': 2, '1101011110110011':
11, '1000101111111011': 19, '1011010110010010': 1, '1010100111110010': 20, '11001011
11011110': 1, '1010000001001001': 6, '0111100110110100': 5, '1010000101000000': 27,
'1111010010010011': 27, '0101001010110101': 1, '1010100101001000': 30, '001000010011
0100': 6, '1011000000011100': 1, '1010100011101011': 5, '1010010111101100': 2, '1101
101010000011': 6, '1100111001100000': 2, '0000111000001001': 8, '1000101100011100':
5, '1111100010010111': 7, '1111010001000000': 4, '0010100100011111': 2, '11111101100
10011': 11, '1000111010000011': 10, '0001011000001100': 2, '1010010100010111': 1, '0
111000100001111': 5, '0100001111101111': 2, '0101001100010001': 20, '001001011100000
0': 3, '0000001101100101': 22, '0111100100101000': 17, '1111100110111100': 14, '0010
000100000001': 8, '1000111001111111': 4, '1100001111010000': 1, '0001001100000010':
1, '1111110110110000': 3, '1010110000100010': 2, '0000011011011000': 8, '00110000101
10000': 1, '0000011001011000': 17, '0101011001110011': 3, '0011000100110111': 2, '01
01101110000011': 28, '1111000110101011': 20, '1100101111100110': 2, '100110100111000
1': 1, '0100101011001111': 1, '1001011101110011': 1, '1000010101101001': 1, '0101011
000101001': 24, '1000101111100111': 22, '0111010010110101': 6, '1010110011111011': 2
4, '1001111010001011': 5, '0011110001010001': 2, '1111100110111110': 28, '1010110010
100111': 6, '1010100111111000': 5, '1001101010001111': 3, '0101111000100100': 26, '1
101011110111001': 1, '1010000001000011': 3, '1101101110000010': 16, '110001111101001
0': 1, '1001101110110011': 1, '0000101110110110': 3, '0101101011010110': 3, '0010100
101001100': 16, '0000011001000100': 31, '0100011001000010': 1, '0010010101100001':
9, '0101001110110010': 26, '0010100001010101': 6, '1000111100010101': 1, '1101011001
101000': 3, '1110010000000111': 1, '1010010111110100': 1, '0000111000101110': 3, '11
00011011101000': 2, '1000001101011000': 17, '0101101100010110': 7, '001001001101111
1': 16, '0101111000010000': 25, '1011000001111011': 1, '0111000111110011': 8, '10101
00111100100': 9, '00001010100011110': 1, '0111111000000001': 1, '0001111000010100':
1, '0100001100110011': 1, '0111110100001000': 6, '1000001110001111': 11, '0010110011
011000': 6, '0000011001110000': 28, '0101101111111111': 7, '0011010001111001': 1, '1
001011011010000': 1, '1010010001010001': 24, '0011010010110110': 5, '100011100011100
1': 8, '1101111010010111': 18, '1011010010100000': 2, '1110000100100101': 1, '110111
1101110101': 2, '0000111111000011': 7, '0001101110011101': 3, '1101001110011111': 2
3, '0010000011111111': 4, '0001001110010001': 1, '1101011000001000': 28, '0000001001
000110': 2, '0010100111111100': 5, '1101111000000011': 4, '0111000101010101': 6, '11
01000100101001': 1, '0111110001001101': 2, '0010110111001110': 11, '001001000111000
0': 28, '0000011111000011': 8, '1111010010001010': 21, '0101011110100000': 1, '00001
01111111110': 29, '0010000011100010': 4, '0000111101011000': 6, '0000001110000010':
7, '0100011010100110': 1, '1010010001101111': 6, '0010000101100010': 9, '11110001001
01011': 8, '1101111100000001': 3, '0111110010100110': 20, '1011100100111001': 3, '00
00110001111100': 1, '0101011010100101': 5, '0110100010101001': 9, '001100011000010
1': 1, '1101111011100011': 3, '0111100001110001': 1, '0110000110001111': 2, '1000001
001011000': 4, '0100001101101101': 1, '0101100100011000': 1, '0111000111001101': 1,
'1010100110111010': 2, '1111110010011100': 6, '0111000100001001': 31, '0111000000000

000': 8, '1101111000101111': 9, '0010100111010110': 28, '1010000101100101': 31, '001
0100100011001': 3, '1101101110100000': 3, '1101010000101100': 1, '0000111110010110':
1, '0100111000000000': 1, '0010100110111101': 1, '0101001001101111': 3, '01000011011
01001': 2, '0000101001001100': 8, '1000010001011110': 2, '0101001100010011': 8, '001
0010111000010': 4, '0001011000001010': 1, '0111000100001101': 20, '1000111110101100
1': 5, '1110010011001111': 4, '1000111111111101': 1, '0000011101110100': 11, '000011
1001110010': 6, '1000011101100101': 5, '1101111000111101': 24, '0111010001100111':
1, '1101101100010001': 20, '1011100000001000': 1, '0111100110011010': 25, '100000111
1111100': 6, '0000111110101110': 3, '0111010000100001': 21, '1011110100000100': 1,
'0010000111101111': 24, '0011010100110101': 1, '1101111010011111': 23, '010100111110
0011': 4, '0010010101110010': 1, '0111000011011110': 1, '1101011001011001': 7, '0111
000110110111': 17, '1000001011000110': 6, '0101001100001001': 26, '110110110001110
1': 20, '0000001001010010': 1, '1000111101000111': 2, '1101011000011000': 15, '11010
01000110010': 1, '1101111000110001': 26, '1111100110000111': 30, '1011110010100110':
1, '0010000011100001': 3, '0001001010010110': 1, '1111110000111000': 24, '0000011000
001101': 6, '0101011110100011': 5, '0000101111111111': 30, '0110110011111110': 1, '1
010001011010111': 1, '1101101010010000': 1, '1000101000010100': 2, '011111001000100
0': 4, '1100111101000101': 1, '1011100010010111': 2, '1111110000101001': 24, '101001
0101000000': 8, '1010110011100010': 29, '1111100010111001': 1, '0101111010100000':
3, '1000101101011101': 21, '1111100101101000': 2, '0111100010010011': 5, '1000011011
111110': 21, '0000111011001100': 5, '1110100000100100': 1, '0111110110111111': 8, '0
010000101000010': 5, '0000111111110111': 4, '0011100110001010': 2, '000010101000111
1': 2, '0010110001101111': 3, '1101111010101100': 7, '0000011010001001': 5, '1111000
100001011': 3, '1000011001011000': 23, '1101001000111110': 2, '1101111000111111': 7,
'1110110011011011': 1, '0000111001110000': 18, '1111110100000100': 9, '0101001110011
010': 27, '1111110011000110': 1, '1000111001010111': 9, '0000101100000001': 6, '0101
101001100001': 1, '1100001010000110': 1, '0101110001111101': 1, '1000101100001100':
5, '1101011001111111': 5, '0001011001110101': 1, '1110000001000010': 1, '00111001100
10110': 2, '1001011000110001': 2, '0001111000111111': 1, '0001011000111000': 4, '011
1000100010011': 6, '0100001111010011': 3, '1111000011110110': 1, '0010010010100111':
7, '1010000001010010': 2, '0100001011100011': 1, '0101011101110111': 2, '01001011101
11011': 1, '0010110011010011': 15, '1100101001010001': 3, '1010110101111000': 7, '11
11000001110001': 2, '1101001110111100': 3, '1101111000011101': 33, '010110111001000
0': 4, '1110000011101011': 1, '0001101110111110': 1, '1000011100110100': 1, '1010011
001101110': 1, '0000111001000001': 22, '1000101111101100': 7, '0111010010111010': 2
6, '1101001000000100': 2, '1101111001100001': 1, '1111000110100110': 15, '1001011000
011000': 3, '1000111110010011': 1, '0000001001100100': 10, '1000001010001000': 2, '1
111000001111001': 1, '1010110101110000': 6, '1101111011001011': 2, '001000010111000
0': 22, '0111110011000111': 2, '1111010000000110': 4, '1100111000100110': 1, '010010
1111001100': 1, '0000011010000000': 2, '1000011001010001': 17, '1101111100100100': 1
1, '1000101111010010': 26, '0000000011000111': 1, '0100101111010000': 1, '0101101010
101100': 1, '1000111011111110': 24, '0010010101101010': 2, '0101001110111011': 22,
'1101101110001011': 26, '0000011001001101': 23, '0010100101000011': 10, '00001011101
11111': 6, '0101101100011111': 4, '0010010011010110': 21, '1100111011001010': 4, '00
00001001000000': 9, '0010110111001100': 3, '1111010010101010': 18, '1101001000100000
0': 6, '1000101001011111': 1, '0010100111111110': 26, '1101111000000101': 23, '01110
00101010011': 2, '0111010101001000': 1, '1101101010010010': 14, '1111010011101001':
1, '1110100101101000': 4, '1111010000011110': 10, '0111110011011111': 8, '1001111110
101011': 1, '1010000111100001': 9, '0011110000101101': 2, '1110000111101110': 2, '11
01101011001000': 1, '0101011111100111': 2, '0010010000110010': 2, '100001111111000
0': 1, '1001111001010000': 2, '1111001000110100': 1, '0111000010011100': 2, '0000011
010011011': 3, '0000011011100110': 22, '1010110000111000': 3, '0110100011111010': 2,
'1010010101110110': 1, '1110111001001100': 1, '1111000110000010': 17, '1010010101100
001': 6, '1000111011001001': 4, '1111000110010101': 6, '0101001100100111': 10, '0010
010111110100': 5, '0000111111011010': 6, '0101000000000110': 1, '0011110000111111':
1, '0111100010000000': 3, '0111000110001010': 13, '1100101111101100': 1, '1111000110

100111': 23, '1001011000011001': 3, '1000111110010010': 2, '0000001001100101': 11, '0111000110010011': 26, '1111110111101010': 2, '1010110000011100': 2, '0101101100111000': 26, '1011100110111110': 4, '1000111011011010': 27, '0101111100000001': 8, '0111010011100010': 7, '1101011110111010': 5, '0011010010001110': 1, '1000101111110000': 5, '1010000101001011': 2, '1101001110101000': 4, '0111100110111111': 31, '0010110101101101': 5, '1111010000100100': 20, '0111000010000101': 6, '1000011001110111': 9, '0000001011101111': 5, '1000011101110011': 1, '1000111111011100': 3, '00000011101000000': 2, '0010100100100100': 3, '1101011100010001': 6, '1010110111011011': 9, '0000101110011011': 3, '1000111001000100': 25, '1000011010101101': 2, '1010100000001111': 1, '0010010001010000': 20, '0000011110100111': 1, '1101101010101011': 6, '0111110100001110': 1, '1010000001011101': 2, '0111100010101111': 2, '0010110011011110': 13, '0010110001111000': 22, '0010100010101010': 12, '0001101000001011': 1, '0111100000001001': 6, '0101101101000001': 2, '0111100010001111': 5, '0100111111010001': 1, '0011110000110000': 3, '0000111111010111': 5, '1001001000100000': 2, '1001001101101001': 1, '0010010111111011': 9, '0101001100101010': 7, '1101101000001011': 2, '0000001011000010': 8, '0101111100011001': 2, '1100001000101111': 1, '0000001000101010': 1, '1000001001001110': 4, '0101100100001110': 1, '0010100100110001': 7, '1011100111110010': 2, '1101001100000100': 24, '0100001111111111': 4, '1101101100101000': 19, '0111110010100001': 5, '0000111001101001': 31, '1101111100000110': 2, '1111000100101110': 3, '1010100110011001': 1, '0010000101100101': 21, '1010010000000011': 1, '0110010011000111': 4, '0101001000001001': 7, '0010010010011110': 1, '0101011010100010': 28, '0000111011101110': 27, '1111100110000010': 28, '1011110010100011': 2, '0100111011001001': 2, '0101101101011100': 6, '1101101100101001': 23, '0111110010100000': 11, '0000111001101000': 19, '0110000001010000': 1, '1111000100101101': 23, '0010000101100100': 23, '0111110110000110': 4, '0110110001101101': 4, '1101111111110111': 1, '0100111101100111': 1, '0101011000011110': 5, '0000011001000101': 27, '0101101011010111': 3, '1001101110110010': 5, '0010100101001011': 6, '1101101110000011': 25, '1001111010111010': 2, '1101011001101001': 3, '0101001110110011': 21, '0010010101100000': 3, '0010100001010100': 6, '0000111000101101': 12, '1001011010100111': 1, '0101111000100101': 31, '0101001100111100': 19, '0010010111101011': 5, '0100001110001110': 1, '1000001101010110': 6, '0010010101100010': 3, '0101001110110001': 8, '0010100001010110': 2, '1010010111110111': 4, '1011010110111111': 1, '1101101110000001': 6, '0010110111000000': 3, '1000101001010101': 6, '1111010010100010': 21, '1101001000101100': 5, '0111110001000001': 1, '1101111000001111': 6, '0010100111110110': 35, '1010100011101111': 8, '0010000100110000': 5, '0110100111100010': 3, '1111010010010111': 25, '0101111001110101': 9, '1010110100001110': 1, '1111110100100010': 1, '0010100001001101': 11, '1010110010110000': 1, '1000111100001101': 2, '1101011001011100': 9, '1010000100111010': 1, '1111000100010110': 6, '1101101111111011': 4, '1010100111110000': 6, '0001001111001010': 2, '0000000111010011': 1, '1011010110010000': 1, '0001111000100000': 8, '1101011110110001': 3, '0111010011101011': 5, '0100101101101101': 4, '0100111001100111': 1, '0010110101100100': 5, '0111100110110110': 25, '1010000101000010': 11, '1000001100111111': 1, '0111110011101110': 3, '1111010000101101': 22, '1101011001100000': 6, '1011000111000110': 1, '1010100101100101': 28, '1010110001010110': 10, '0101111111111011': 1, '0010100010011101': 1, '1101011100100100': 6, '1100001011000111': 1, '0000111101111101': 2, '1100011001010101': 2, '1010000110001100': 4, '0101101000100111': 1, '0000101101000111': 8, '0100001101001000': 2, '0111110100010001': 5, '1001001100101010': 1, '0111100100001100': 19, '1000101110011111': 2, '0101111000001001': 30, '1001001100110110': 1, '0111100100010000': 31, '0111110000100011': 7, '0010110000101101': 6, '0010101100100001': 1, '0111010110110101': 4, '1000101011000111': 6, '1010000110101111': 7, '0101110100011100': 1, '0110100101110001': 2, '1000111001101101': 24, '0000101101111011': 5, '0101101000011011': 2, '1000011011000100': 6, '0000011101100011': 2, '0000111001100001': 28, '0100111011000000': 1, '0111110010101001': 2, '1101101100100000': 24, '0101111100101100': 12, '1111110000110100': 25, '0101001101111001': 7, '1010110001101011': 5, '0010010001011011': 7, '0000011110101110': 4, '1000111001001111': 3, '1010100000000100': 2, '1000011010100110': 11, '1111110110010110': 6, '1100111111001010': 1, '0001001110101000': 1, '1011010010011011': 2, '1000011101000011':

0': 10, '0011110011010100': 1, '0101111000101111': 15, '0000001111000010': 33, '0010
010010111011': 1, '0101011100100100': 7, '0000111100011001': 1, '0010010011010100':
5, '0101101100011101': 37, '0010110111001010': 4, '1111010010101100': 2, '1101001000
100010': 3, '1000101001011101': 7, '1101111000000111': 3, '0111000101010001': 7, '10
00111011010000': 5, '0110110101010000': 1, '0111010000000100': 24, '001000011010101
0': 8, '0110100001101001': 1, '1010000111111110': 30, '0101001101000110': 1, '111111
0000100101': 20, '1000011000101011': 2, '0111000001011101': 4, '0000111100100000':
2, '1111100101110100': 9, '1111010101000001': 1, '1111100010100111': 5, '01100001110
11110': 1, '0010010000001000': 5, '0101001010000010': 6, '0000011111111000': 3, '010
1101100101101': 27, '0010110010100001': 2, '1100101011000110': 1, '010101101001100
1': 8, '0111100010110000': 3, '0110110101000001': 2, '1111010011011010': 6, '1000101
001101101': 8, '1001011100001101': 1, '0010100000100000': 3, '1110010000110010': 1,
'1000111101100000': 10, '0000111011100011': 16, '0101000100011101': 1, '101010011101
0011': 19, '1101001100100100': 16, '1111010001100001': 1, '1011110100011101': 1, '10
10010011011111': 24, '0101100101011000': 1, '1000001101110011': 3, '100101101000100
0': 1, '0011110100101011': 1, '0111000001000000': 1, '1101111110000111': 7, '1010000
011000111': 5, '1001111111010100': 1, '1010010111000011': 8, '1110110111111110': 3,
'0000111011011011': 18, '0101111001111111': 3, '1010100100111101': 6, '1010110001101
010': 3, '0110110011111000': 1, '0111110010001110': 21, '1111010011101111': 4, '0100
101110101111': 3, '0000111001100010': 11, '0000011101100000': 7, '1010100110001011':
9, '1101001000110111': 3, '1101111000110100': 27, '0000111001111011': 5, '0000011101
111101': 4, '1110110011010000': 1, '1000011101101110': 2, '1101101100011010': 8, '00
00001001010111': 1, '0101011100110101': 3, '0000001101111000': 17, '001001001110010
1': 4, '1101001101011000': 9, '0000001111011110': 16, '0010000010011110': 3, '000010
1110001010': 13, '1010110111101010': 4, '0010000001011000': 4, '1011110001011100':
1, '0011010010111111': 2, '0001011110100110': 2, '0100111001111001': 1, '01010111011
10000': 1, '1100101011010001': 1, '0010110011010100': 12, '0000101101010110': 7, '01
01101000110110': 2, '0001111000011000': 3, '0111110100000100': 7, '001011011111010
0': 3, '1000101101110011': 6, '0111100100100110': 2, '0101011100001101': 7, '0101101
110110111': 18, '0000011110001010': 4, '1111000000111100': 5, '0010010001011001': 2
2, '1101011110011101': 1, '1111100111000010': 6, '1100111111011100': 1, '01100100001
01101': 1, '0000101101011101': 21, '0111110100001111': 4, '0101101000111101': 8, '10
00001110001000': 3, '1101111011111000': 1, '1111000011111100': 1, '001001001010101
1': 3, '0001101000001010': 1, '0101011101111011': 1, '0010110011011111': 27, '001000
0100111001': 2, '1010100101000101': 39, '0001011100110010': 1, '1100001110001110':
1, '0101101010100010': 7, '1000111011110100': 4, '1101101101010110': 2, '01010010101
11000': 2, '0110110101110100': 1, '0010011001001100': 1, '0000111011011000': 4, '001
1110010101011': 3, '1000001101010001': 25, '0000101001100100': 7, '001111001011100
1': 2, '1110000101011000': 1, '0111001010010101': 1, '1111010010101000': 11, '110010
1111011111': 2, '0001111000100001': 3, '1011010110010001': 1, '1010100111110001': 4,
'0111010011101100': 1, '0011010010000100': 1, '1000101111111010': 12, '0100111001100
110': 1, '1010000101000011': 2, '0111100110110111': 32, '0010110101100101': 9, '0111
100111111001': 2, '0000101011001110': 7, '0010100101110001': 23, '0000111001010111':
4, '0101001110011000': 1, '1000011101000100': 14, '1000110010001101': 1, '0101101101
011010': 4, '0111110010100010': 16, '1111000100101111': 5, '0110100001111101': 6, '0
001001000111100': 1, '1101111100000101': 4, '0000011101101000': 7, '011011001111000
0': 1, '1101101010011110': 7, '0010010010011111': 3, '1010010000000000': 3, '1000101
000011101': 6, '1001001001100001': 1, '0001101100001100': 5, '0010000101100011': 15,
'1111000100101100': 25, '1101111100000000': 5, '1101101110101111': 16, '101000010110
1100': 17, '0110101101110010': 1, '0000011000101010': 2, '0010100000010010': 1, '110
1011000100111': 4, '1000111101010010': 2, '1101111000100000': 16, '110001101010011
1': 1, '1110110011100100': 3, '1000101101000001': 21, '1000101011100101': 1, '000000
1001111111': 1, '0010100101100110': 8, '1001011000010101': 1, '1000001010000101': 1,
'0000001001101001': 6, '1111100000100011': 2, '1101001000001001': 6, '000010110010100
01': 1, '0111000101110110': 3, '1101011101101111': 1, '1011110000010001': 4, '110100
1001100111': 1, '0001101100011001': 4, '0111000100010100': 20, '1111100000000001':

4, '1111000100111001': 19, '1101001111011101': 2, '1111000001010010': 1, '1011000110 001110': 4, '1111100000101000': 7, '0001001110111111': 5, '1111000110100000': 5, '11 00101111101101': 1, '1000111110010101': 1, '1101001000000010': 3, '100010111110111 0': 26, '0100111111111110': 1, '0010000110001011': 12, '0001001110001010': 3, '00000 01101101011': 5, '0101001000111011': 2, '0010110001011000': 15, '0000001111111010': 22, '1010110111010011': 5, '0000101110010011': 5, '0010100100101110': 2, '0111010100 111001': 5, '0000001111101011': 29, '1110100100011001': 1, '0010000010001011': 1, '1 111000010011011': 10, '1010010100001110': 1, '1000101001101000': 9, '011101000001101 0': 6, '1000001110100011': 7, '0101111100110111': 1, '1010101011110111': 1, '1011011 010011101': 1, '0101101100101000': 25, '0000011111111101': 1, '1010100100100011': 1, '1010110000010000': 4, '0001011101011000': 1, '1011100110110110': 3, '00011110111100 11': 1, '0100101000011010': 1, '1000111011010010': 19, '0000101110101000': 7, '10100 10001111001': 33, '1001011010111000': 1, '1000001101001100': 26, '1100101101000111': 1, '1000101101100000': 27, '0111000000011011': 1, '1111110110011001': 2, '1011100101 010000': 1, '1101101110101110': 22, '1000111101010001': 4, '1101011000100100': 26, '0111000000001110': 3, '1000001011010010': 6, '1111110010010110': 29, '1101111011101 111': 6, '1111100100100101': 27, '1111100001011010': 1, '0000001111100110': 21, '001 0000010000110': 3, '1000011010100001': 1, '1000111001001010': 3, '0010100011001011': 6, '1000011101000010': 2, '0000111001010001': 24, '0010100101110111': 9, '0000101011 001100': 3, '0000001111110010': 19, '1100101001111101': 1, '1001001110001001': 1, '0 101001000110001': 3, '0101011000001000': 25, '0111000100011011': 6, '111000001000111 1': 1, '0010110111010111': 2, '1010000011011011': 12, '1111000001111111': 1, '110100 1110110100': 6, '1111100000101010': 4, '0010000001000010': 1, '1010010001101001': 2 8, '0000011011010111': 25, '0100011011010001': 2, '1101001101110101': 6, '0101011101 010100': 8, '0000111110000111': 1, '1010000101010010': 10, '0010110101111000': 7, '0 101101101101101': 2, '0010010011000100': 7, '0010010001001010': 5, '010101111011101 0': 10, '0000101111000110': 31, '0101101011100110': 1, '0000011001010000': 21, '1111 100011101111': 3, '1101100110011010': 1, '1001101010110011': 1, '1000111100100111': 1, '1110010001110101': 1, '0010100001100111': 1, '0001111010011011': 3, '01011110100 11111': 26, '1000010011010011': 1, '1000101001000110': 1, '0010100111100111': 30, '0 110110011101110': 2, '0000111010111011': 5, '1111110010101001': 4, '101000011110100 0': 6, '0101001010010011': 7, '1001001100011011': 2, '0010110011110010': 17, '001001 0101010001': 4, '0101001111000000': 4, '0010100110011001': 2, '1111000010000111': 9, '1000111010110010': 2, '0010000111001100': 6, '1101101110010000': 5, '11011110000010 11': 5, '0010100111110010': 20, '0111000101011101': 5, '1111010010100110': 24, '1000 101001010001': 7, '0010110111000100': 5, '0011110010110111': 1, '1010110101011100': 2, '0010010011011010': 24, '0111100001011001': 3, '0101101100010001': 15, '100011111 1001101': 3, '0101101110010100': 5, '1010110101101100': 6, '0000111001000101': 27, '1000011100110000': 4, '1010110011010010': 21, '0000011011110100': 5, '1101001110010 010': 27, '1000011101100001': 1, '1110110011011101': 1, '0000011101110000': 4, '0000 111001110110': 4, '1000111101001111': 3, '0000001001011100': 2, '1101101100010101': 25, '0101000100010011': 1, '1010000010110111': 1, '1010100111011101': 14, '011110011 0011001': 7, '1000001101111101': 20, '0101111000111011': 11, '0001111100000001': 3, '0111010000100111': 5, '1000001111111110': 23, '0011000010010110': 3, '0000011010100 011': 8, '1010110001110101': 21, '1101111010001110': 16, '1011010100101111': 1, '010 1011011011011': 3, '0001111010011111': 4, '0101111010011011': 23, '101101001110001 0': 1, '1111100100111001': 20, '1101001111111011': 7, '0000001111011011': 41, '00100 10011100010': 21, '1000001001010001': 7, '0101100100010001': 2, '0000001101101100': 25, '1010101101010001': 1, '0000111011010000': 11, '1101011111100111': 1, '111101011 0101100': 2, '0101111001110100': 5, '1010100011100111': 31, '1101001010100110': 5, '0101101000001101': 6, '0000101101101101': 20, '0010110111110010': 6, '0111100100100 000': 23, '0000101011101111': 9, '1000101101110101': 30, '0010010011111011': 32, '01 11100001000000': 1, '0101101100001000': 20, '0110100111001100': 1, '110111100010100 0': 21, '1101001101000100': 3, '0000011011000110': 21, '0110000110001000': 1, '00000 01101100100': 33, '0101001011111111': 3, '0010000011000010': 12, '1101111011000101': 1, '0010110000000000': 12, '1110010001000010': 2, '1100001011111000': 1, '1001111010

011101': 1, '0010110011001001': 7, '1111100110001011': 21, '0010000011101101': 3, '0000001110001101': 3, '0111110101111001': 2, '1101011111110100': 1, '1010010001100000': 17, '1001011011100011': 1, '1111000110011111': 28, '0101001100101101': 28, '1000001111001000': 6, '0000111111010010': 5, '0111100010001100': 3, '1001001000100101': 3, '0101001010011000': 2, '0100111111001010': 1, '1010000111100011': 29, '0010110011111001': 6, '0000011010011110': 6, '0111000010011101': 3, '0101011010111110': 20, '1100011110011111': 1, '1111100100001101': 23, '1000001000100011': 1, '0000101001110101': 6, '1101101111101111': 5, '1111010001110100': 10, '0100111001001111': 1, '0000001100001011': 1, '0111110000010010': 6, '1000101010000110': 3, '0010100110100111': 8, '0101111000001110': 7, '1101001101101111': 2, '1011000010110011': 3, '0111100101101010': 1, '0111110000111101': 28, '1101011011010001': 1, '0110110011000111': 2, '0011110010101111': 2, '1011100011111100': 1, '0101111001111000': 6, '0111100010101010': 2, '0010001111000011': 1, '1010000001011100': 2, '0110100100000000': 2, '0010110011011011': 24, '0010010011010111': 18, '1000111111000010': 5, '1111010111000110': 2, '0111010011110011': 8, '0111000010111100': 2, '0011110000100110': 2, '1010000111101100': 6, '1110000111100111': 2, '1111010000010111': 8, '1101001011010000': 1, '0010000111001000': 5, '0101011010110101': 11, '0100101101010111': 1, '1111000110001110': 29, '0000011011101010': 20, '0010100110011011': 2, '0011100100001111': 1, '0001101010100111': 1, '0000011111010011': 2, '1101101000000111': 1, '0101111010110010': 26, '1010000111011110': 24, '0110100101000000': 2, '0010101001001100': 2, '1101111111101110': 3, '1010110010010111': 7, '0111110110011111': 3, '0100111101011110': 1, '1001111100111101': 1, '0000111001010100': 24, '1111110100011001': 5, '0101011000011011': 4, '0010100011010010': 8, '1111010111110010': 1, '1101101000100001': 6, '1010110101001001': 10, '1000011111100010': 8, '0001101011000001': 1, '0010100000001000': 1, '1000111101001000': 7, '1101011000010111': 3, '1101111110110110': 2, '0000101110010101': 2, '1010110111010101': 1, '0111010001111011': 4, '1101001011000001': 1, '0010000111011001': 8, '1011100110011011': 4, '0111110101111111': 1, '0000111101010001': 12, '0010110011001111': 17, '1101111110100110': 8, '1101011010011111': 29, '1101001001111000': 2, '0111000000100100': 5, '0001011000100000': 1, '0000111011111111': 27, '0000011111101111': 6, '0110100111010011': 2, '1111010010111011': 32, '0111110001011100': 5, '0111100101001111': 2, '1101001101111000': 7, '1010110000100000': 2, '1111100110111011': 32, '0010000100000000': 7, '0111100100101001': 19, '0101101110111000': 9, '1001111010001110': 2, '1010110011111110': 30, '1010110011101010': 30, '0010000100100011': 1, '0101111010101100': 8, '1000101101010111': 6, '1010000111001110': 28, '0000111011000000': 6, '1000011011110110': 22, '1010100000110100': 4, '0111101110001110': 1, '1101001110001010': 16, '0100110010001111': 1, '0111110001111111': 4, '1110100101011101': 2, '0111010101111101': 2, '1000101001101011': 2, '1000111011100111': 27, '1111000010011000': 4, '1010000100101110': 4, '0100001101001111': 1, '1100101100011001': 1, '0110000011100000': 1, '0111000110101111': 19, '1000101010000100': 1, '0111110000010000': 27, '1000001011111010': 5, '0101100110111010': 1, '0010100110100101': 1, '0101111001100101': 5, '1010010001100100': 23, '1111100110001111': 27, '0101111000000110': 7, '0110000011101010': 1, '0101101000101000': 8, '0000101101001000': 34, '0111000110100111': 26, '1000100110110011': 1, '1001001100111001': 5, '0100001101011101': 4, '1000011001001001': 31, '1000011111001110': 8, '0010010011110011': 15, '1000101101111101': 15, '0111100100101010': 6, '0000101011100111': 7, '0010110111111100': 1, '0000101101100101': 27, '0101101000000101': 6, '1101011000101101': 16, '1000111101011010': 2, '0010100111010011': 13, '1101111000101100': 23, '1000001111110110': 24, '0010110010011001': 1, '0111010000101101': 16, '0111100110010100': 7, '1101011100110101': 9, '1100001011010100': 1, '1010110111111011': 6, '1010110001000011': 9, '1010100101010110': 8, '1101001101100001': 2, '1010110000111001': 6, '0000011011100111': 38, '0000001101000001': 26, '1111000110000011': 13, '0010000000011001': 1, '1001111110101111': 1, '1010000111100101': 10, '1110000111101010': 3, '1001111000100010': 3, '0101011001010100': 13, '1100111001001011': 2, '1101111110001101': 1, '1101001100010010': 3, '1010100011101101': 2, '0000001011010000': 3, '0000101110111011': 1, '0101101011011011': 1, '0010100101000111': 8, '0100011001001111': 3, '1101101111000111': 28, '0011000000000101': 2, '0010100001011010': 1, '0010010101101110': 5, '010100

```
1110111111': 14, '1111010000101000': 22, '0111110011101001': 3, '1110010000001100':
1, '0000001111000100': 10, '0010010010111101': 1, '1010110111100101': 3, '0000101110
000101': 3, '1101001010110001': 2, '0010000111101001': 8, '1010100011101110': 26, '1
101001100010001': 28, '1010110001001001': 20, '1110000010010001': 1, '000010110000000
00': 4, '1010010100011101': 1, '0111000100000101': 37, '0101001100011011': 6, '00000
11011001101': 15, '1101001101001111': 1, '1000101110010010': 3, '0111100100000111':
10, '1001001100100101': 2, '0000101101001100': 34, '0101101000101100': 7, '010000101
1011110': 1, '1010000001101111': 6, '0010110011101110': 25, '0101101111010110': 12,
'0000101101110110': 4, '1000111001100000': 26, '1111100110100011': 22, '101000011010
0010': 5, '1000101011001100': 1, '0111010110111010': 9, '0000101011011000': 3, '1011
110110000001': 1, '0101111101001011': 2, '1010000001111001': 10, '1011010000101100':
2, '1111110101110000': 1, '0010110011010110': 22, '0101011101110010': 3, '0000101101
010100': 13, '0101101000110100': 8, '0111110100000110': 2, '1101111010011110': 25,
'1010010000100111': 2, '1000001111101011': 25, '0111000011111110': 2, '0001101111011
100': 1, '1010100101110001': 15, '1000011010010111': 5, '0000111010000001': 4, '1101
101100000000': 23, '0000111101101101': 5, '0010000111011010': 31, '000000110100100
1': 27, '1010100100000110': 1, '1101001101101001': 2, '1010110000110001': 9, '101010
0001001100': 7, '1101111110101101': 4, '0000011010100110': 10, '0011000010010011':
1, '1101001100101000': 27, '1010110001110000': 14, '1000111110101111': 2, '000011100
0111001': 4, '1111110011101010': 4, '0101111110010001': 3, '1000011100100110': 2, '1
101001110110110': 17, '1001011000011110': 2, '1000001010001110': 2, '111111000001011 0
0': 7, '1101001000010110': 2, '0111000101000011': 4, '1101111000011001': 19, '010000
1110100011': 1, '1000011011101011': 28, '1110010010001101': 1, '0000111101100101': 1
0, '1101001011001000': 1, '1101101100001010': 5, '0010000111010000': 6, '11110101000
00100': 5, '0111110000001110': 5, '0111100100111011': 5, '0111010010000010': 23, '01
01101111101010': 5, '0101101110011010': 28, '1101111000010101': 27, '101110010001110
0': 3, '0100001110010111': 1, '1101001111001110': 4, '0001101010011010': 1, '1111101
100001000': 1, '1010100011000110': 6, '1000011001100100': 19, '0000111000110010': 2,
'1111010001011100': 5, '0101001101000010': 1, '0001001010000011': 1, '10000110001011
11': 3, '1010010101001000': 10, '1111110000100001': 33, '1111100101110000': 10, '001
1100101011001': 1, '1111000100011101': 35, '1010000100110011': 1, '010111111101011
0': 3, '1000111000101000': 9, '1111110100111000': 10, '1000101111011110': 19, '11111
01001011100': 1, '1100000101101001': 1, '0000101111010111': 24, '0101101010110111':
3, '1010110110010111': 1, '1100111010000011': 1, '0010000111101010': 30, '0011110100
111001': 1, '0010001001101100': 1, '1101101001111001': 4, '1000111000100001': 5, '11
11100111100010': 3, '0100011110001010': 1, '1110110001100000': 1, '011110000011011
0': 3, '0010110001100001': 35, '1101111010100100': 5, '1010000111001010': 23, '01010
01011100100': 1, '1010010001001001': 25, '1101011111010101': 1, '1101001110001110':
21, '0101111010001000': 7, '0111100010011101': 2, '1000011011110010': 27, '101010000
0110000': 1, '0000111011000100': 6, '1110110000001111': 1, '0110000101011001': 1, '1
101011010101101': 4, '1100011111111110': 1, '1000001110101001': 1, '010011001000011
0': 1, '0111110001110110': 1, '1111010011010111': 7, '1110100101010100': 1, '0111010
101110100': 1, '1000011001000101': 32, '0110000001100111': 1, '0111110010110111': 1
7, '1101011000111101': 22, '1101101100110000': 19, '0111010010010101': 8, '011110000
0100000': 7, '1110100001110101': 1, '0101101101101000': 5, '0010110000010001': 9, '1
101000110110100': 1, '1010010001011111': 2, '1000111001010001': 27, '000010110000011
1': 1, '0000011001001000': 28, '0011000100001101': 1, '0111000010001010': 5, '101010
0010111110': 2, '1000011001111100': 24, '1111000100001101': 18, '1111010000001001':
27, '0111110011001000': 1, '1101111010101110': 22, '0000111111110001': 2, '001000010
1000100': 39, '1010110011001011': 19, '0111010111000110': 2, '1000101111011001': 5,
'1111010100110100': 9, '0011100010010100': 1, '1010100110011100': 1, '01011111001000
01': 11, '1111010000010101': 23, '0111110011010110': 6, '0101111011001100': 2, '0000
011010010111': 2, '0111000010010110': 4, '1101111100110011': 5, '1101001101101110':
1, '0000011011101100': 6, '0110000111101110': 4, '0001001110101111': 1, '01110001111
00010': 5, '1001011100101100': 1, '1000011001110011': 9, '0000111000101001': 4, '110
0011011101101': 1, '0111110011100001': 1, '1111010000100000': 22, '110101100110110
```

1': 6, '1110000111110000': 2, '1011010110111001': 1, '0011000100000100': 3, '1100101
111010011': 1, '0001111000101101': 1, '0001001111000101': 1, '1010100111111101': 5,
'1000101111110100': 9, '0011010010001010': 3, '1101011110111110': 10, '0100101101100
000': 1, '1010000101001111': 6, '0111100110111011': 36, '0101001101001110': 3, '1100
111001110100': 4, '0111000001010111': 1, '1000011000100001': 3, '1111110000101111':
6, '0111010011110010': 7, '1111010111000111': 2, '0111000010111011': 10, '0001011010
111111': 2, '0101111111001010': 1, '0101001000001101': 4, '0011100110101111': 2, '11
01001010000111': 3, '1110000100010000': 1, '0111010101000001': 1, '011111001000001
1': 21, '1110100101100001': 4, '1001111110110110': 2, '0010000110000110': 3, '101001
0010101010': 9, '1111100010010100': 1, '0110110001111010': 2, '1111110000001101': 2
1, '1101111101010000': 2, '0100011011110101': 2, '1010010000011110': 1, '11010011010
10001': 6, '0101011011111011': 2, '1111100100110111': 8, '1100011101100101': 1, '001
0110110010000': 1, '0000001101110001': 15, '1100011001011010': 1, '000011110111000
0': 5, '1001001110100110': 3, '1010000110000111': 12, '1010000101110000': 11, '00001
00111110110': 1, '1101101110110011': 25, '0111100110100100': 7, '0001011000101101':
2, '1110000001111110': 1, '0000111011110010': 26, '0101001110000011': 18, '111101010
0010110': 3, '0010000111100010': 32, '0110010001000001': 3, '0010100001100000': 10,
'0101101101101100': 3, '0010010011000011': 27, '1100101010110010': 1, '0101011101010
011': 2, '0000111110000000': 2, '1010000101010101': 18, '1111100111011101': 2, '0101
011001110111': 3, '1000111001011010': 6, '1010010010110110': 2, '1000101001001110':
2, '0010100111101101': 7, '0110110011100110': 3, '1001011011011110': 2, '10100100010
11101': 23, '0101101111110011': 11, '1110000101000110': 2, '1000101111000011': 24,
'1111110010001110': 16, '1010100111001100': 8, '1010100001101001': 10, '110110111101
1011': 6, '1111100100011101': 24, '1011100100100101': 1, '1101011000111100': 26, '01
11110010110000': 7, '1101101100110111': 6, '1000011001000010': 11, '100010100100110
0': 7, '0010100111101011': 24, '0101000111011101': 1, '1010010000110000': 6, '010111
1010010011': 26, '1011010011101100': 1, '0000101111100001': 7, '0101101011000001':
1, '0101101100001100': 25, '0110100111001000': 1, '1101001000110011': 1, '1101111000
110000': 20, '0000111001111111': 3, '1000011101101010': 2, '1111111000110110': 1, '1
010110101000111': 4, '1001111011101010': 1, '1010100110001111': 9, '111010011001010
1': 1, '0101101110101010': 19, '1011110000100100': 1, '0110010101000100': 1, '100010
1101001110': 5, '0010100101101011': 8, '1000001010010110': 1, '0010110100111101': 1,
'1000101011101010': 5, '0000001001110010': 1, '1111100000110100': 5, '01110001101011
10': 21, '1111001100010100': 1, '0001001101101000': 2, '1000001011111011': 3, '10001
01010000111': 3, '0111110000010011': 3, '0010100110100110': 5, '0101100110111011':
1, '0101111000001101': 14, '0000011001101101': 29, '0011010000101001': 4, '001001011
0001010': 3, '1101011110000101': 1, '0010100000111110': 1, '1010010111011101': 2, '1
000111101111110': 6, '1110010000101100': 2, '0000011110100100': 1, '001001000101001
1': 6, '1000000001101000': 1, '1000111001000111': 6, '0111110001101010': 2, '1111010
011001111': 7, '1000101001111110': 2, '0111100101011011': 1, '1001011010110110': 2,
'1010010001110111': 11, '0101111001010100': 7, '1101101011100011': 1, '0110100100111
100': 1, '0101001110100010': 24, '0111100100111000': 24, '1000101110000111': 5, '110
1111011001010': 8, '0010110000001101': 8, '0101001011110010': 4, '0010000011001111':
6, '1010010111000111': 2, '1110110111111010': 1, '1000001101101010': 8, '10101011010
10010': 1, '0000111011010011': 26, '0111010101111111': 1, '0111110001111101': 7, '11
11010011011110': 8, '1110100101011111': 1, '0111010000011001': 14, '100011101110010
1': 7, '0010110011111110': 25, '0010000100100001': 3, '0001011100001000': 1, '010111
1010101010': 22, '1000101101010101': 23, '0000101111011000': 6, '0101101010111000':
3, '1000011100110101': 2, '0111001101110100': 1, '0000111001000000': 24, '1010110101
101111': 2, '0101101100011010': 8, '0010100011010001': 6, '1101001000100111': 1, '11
11010010101111': 25, '1000101001011010': 3, '0010110111001101': 1, '011111000100111
0': 1, '0000100101001101': 1, '0111000101010100': 10, '0010100111111011': 19, '11011
11000000010': 9, '0100010000011101': 3, '0101111110111011': 9, '1111100010111010':
6, '0010000100101000': 7, '0101101100000000': 31, '0000101111101011': 24, '010110101
1001011': 2, '0001101101110101': 2, '0000101001011001': 9, '1010001110101111': 1, '0
000011011011111': 21, '1101001101111101': 6, '0111000110000110': 29, '01101100110000

00': 3, '1101011011010110': 7, '0111100101101111': 2, '0111110000111100': 15, '11001
11010111011': 1, '0010110010110111': 7, '0000011001001001': 30, '0011010101010010':
1, '0101101010100100': 1, '1000111011110010': 23, '0111110100110101': 7, '0010010000
101001': 6, '0001101010101000': 1, '1010000111010011': 28, '0000111011111011': 30,
'1110000001110101': 2, '0111000000100000': 5, '0001011000100100': 5, '01110001011010
01': 4, '0101100100111000': 2, '0000100111111111': 1, '1000001001111000': 3, '110110
1110111100': 6, '0111100110101101': 5, '0110100101011100': 4, '0101001111000010': 3,
'1011001100010101': 1, '1010100001001101': 4, '1010110000110110': 2, '10101001000000
01': 1, '0000011011101000': 6, '1101101110010010': 32, '1100011111100010': 2, '00100
00111001010': 25, '0000001011100010': 10, '1000111111010111': 4, '0000011101001101':
9, '1101011100011110': 1, '1010110111010110': 3, '0000101110010110': 2, '01111001010
00101': 1, '1111010010110001': 9, '0111110001010000': 8, '1000111011001010': 27, '10
00111011101011': 21, '0101101011111101': 1, '1011110110110111': 1, '101001000011010
1': 2, '0101111010010110': 21, '1101111000010001': 24, '0101101110011110': 19, '1001
101100001110': 1, '1000111000011111': 2, '0011010110111111': 2, '1000011011010110':
25, '1101111011011010': 4, '0011000110011100': 1, '0010110001011111': 8, '1001001110
000100': 1, '1111000100111011': 3, '0000111001111001': 29, '0110000001000001': 2, '0
011100000001101': 2, '0000011001100011': 8, '0100011000101001': 1, '010000110101111
1': 1, '1000011011001001': 5, '0110010001000000': 1, '0001001001010100': 1, '1000111
001011100': 26, '0101101001101110': 1, '0000101100001110': 3, '1000111100101001': 1,
'0110110001000100': 4, '0010100001101001': 7, '1111110101001100': 2, '100101100011 11
10': 1, '0001111000110010': 1, '1011010110000010': 4, '0011100110011011': 2, '011100
0111011001': 1, '1101000110111111': 1, '0010110000011100': 4, '0010000110010111': 5,
'0011000100010000': 1, '0100111111100110': 1, '1001111010111101': 1, '11000111110101
10': 1, '1101101110000110': 25, '0000111000101010': 4, '0010100001010001': 2, '01010
01110110110': 25, '0010010101100101': 8, '0010010001001000': 31, '1000111001010100':
24, '0010010001111000': 30, '0100111011101010': 1, '0010100100000101': 3, '101000010
1111001': 19, '1010110010000110': 4, '1101001001111110': 2, '1101111001111111': 2,
'1010010000001010': 1, '0110010011001110': 1, '1101000110000011': 2, '11010010100010
00': 1, '0010010010010111': 4, '0000111100000010': 2, '0111010011001111': 3, '100000
1010100011': 2, '0110010101001001': 1, '0101001000101110': 1, '0101100111100011': 1,
'0000111001001110': 3, '1111000000001000': 6, '1010110101100011': 3, '001001000100 01
00': 33, '1000111001011000': 20, '1111110000101110': 5, '1101111101111001': 2, '1000
011000100010': 1, '1111010001010111': 5, '1101001000101001': 6, '0101001100110100':
17, '0111000001101111': 1, '1111110001110001': 8, '1010100011011011': 9, '1100011101
010100': 1, '1010000000101000': 2, '0100011011000101': 1, '1010010001001110': 5, '00
01101110000111': 1, '1101001110001001': 9, '0101001100110110': 8, '001001011110011
1': 9, '1000001101011100': 14, '0001111001000101': 1, '1000111101100010': 2, '011100
0110100101': 4, '0000000111110111': 1, '0010100110101111': 7, '1000001011110010': 3,
'0111110000011100': 28, '0101111000000100': 17, '0010010011101100': 6, '000000111101
0011': 16, '0101001000010100': 9, '0101011100111100': 4, '1000111001000011': 5, '000
0101100011001': 6, '0101101001111001': 4, '1000011010101100': 2, '1010100000001010':
1, '0000011110100000': 3, '0010010001010111': 5, '0111010111011011': 3, '01010111110
00111': 3, '1110100111111011': 2, '0111010010001101': 4, '0111100100110100': 19, '01
11110000000011': 7, '0001101100101010': 1, '0010000101000001': 23, '011111101101111 1
0': 3, '0011000100101000': 3, '0010000010101100': 3, '1110100110100111': 1, '1010110
011001100': 9, '1000101111011000': 11, '0110010011010011': 1, '1011100110101110': 1,
'1101001100111100': 31, '1011100100101000': 2, '0000001100011100': 4, '1101110001010
101': 1, '0111000110111010': 24, '1101001111110110': 3, '0101011011111000': 1, '0101
001000010001': 3, '0010010011101111': 17, '0000001111010110': 25, '110111100010101
1': 5, '0010100111010010': 20, '0010000111000101': 9, '0101011010111000': 2, '110110
1110011111': 33, '0111100000110100': 8, '0010110001100011': 6, '1101111010100110': 1
6, '1101111010000001': 6, '0000111110100111': 1, '1000001111110001': 6, '01110100001
01100': 26, '1110110101100001': 2, '0111100110010011': 25, '0010000110110011': 6, '1
000011001000100': 26, '0110000001100110': 1, '1000000101001100': 1, '110110110011000
1': 21, '0111110010110110': 22, '1101011000111110': 10, '1000101111000101': 6, '1111

110010001100': 2, '1010100111001110': 22, '0101101000011101': 12, '100011100110101
1': 8, '0000101101111101': 18, '0010011001111000': 1, '1000011011000010': 17, '01111
10000100101': 26, '0111100100010110': 6, '1001001100110000': 1, '0110110001111101':
2, '1000101100011110': 1, '1000011000011001': 7, '1001101000110100': 1, '01110001101
11110': 21, '0000001111010010': 18, '0010000010010010': 1, '0010010011101011': 26,
'0101001000010101': 4, '1101011011010000': 4, '0111110000111110': 4, '00101101101110
11': 2, '1001011010000011': 3, '1000001101111000': 20, '1000001110001110': 8, '00001
01101011001': 23, '0101101000111001': 5, '0000000111100010': 2, '0111000111110000':
4, '1010100111100111': 30, '00000111111001111': 2, '0010010001111110': 6, '1111010010
000100': 3, '0101001011000110': 2, '0000101111110000': 10, '0101011110101110': 5, '0
011110010010111': 2, '1010110001101000': 22, '0111110010100100': 9, '011000000101010
0': 1, '1101111100000011': 4, '0010000101100000': 19, '0101011010100111': 22, '01100
10011000010': 1, '0101011010001111': 21, '1001111001111101': 1, '0101111001100100':
3, '1101011111110001': 1, '1001011011100110': 1, '1010010001100101': 24, '0000001110
001010': 9, '0010000011101010': 10, '1011110010101111': 2, '1011100110011000': 1, '1
011010101010000': 1, '0000101111110110': 32, '1111010010000010': 20, '001001000111111
00': 32, '1110100101001010': 2, '0111100101011101': 5, '1000101001111100': 10, '0010
000000111000': 1, '1010010001110001': 23, '1001011010110000': 2, '0101111001010010':
4, '1000001110111111': 5, '1111000010110111': 9, '0110110010100001': 1, '10001000110
00110': 1, '1010110000011000': 4, '0101101100111100': 24, '1010100101100000': 29, '1
010110001010011': 9, '0001111010110000': 2, '1101011100100001': 6, '110000101100001
0': 1, '0001001110110000': 1, '1111011010010001': 1, '0000001001101101': 11, '110010
1111100010': 3, '1111000110101111': 20, '1101111001101010': 1, '1101001000001101':
4, '0111010010110001': 10, '1000101111100011': 24, '0111100100111001': 26, '10001011
10000110': 10, '1101001110111011': 24, '1010110101111001': 5, '0010110111011010': 9,
'1101111001101000': 1, '0111000101110010': 6, '0101011000101101': 18, '1111100000100
111': 1, '1100101011111100': 1, '0101011100011011': 1, '1111000101010100': 8, '10000
11010001011': 6, '0000101111101100': 7, '0101101011001100': 1, '0111100001001001':
4, '0101101100000001': 32, '0010000100101111': 1, '1101101000011001': 3, '0101111010
100110': 28, '1010110011110011': 20, '1001111010000011': 2, '0011100010110110': 1,
'1000101111010011': 22, '0111100110111110': 19, '1011100101110001': 2, '101000010100
1010': 4, '1010100111111100': 6, '0011010010001111': 2, '1101011110111011': 5, '1000
101111110011': 26, '0000001011111110': 7, '1010000110110011': 7, '0010010000000101':
3, '1101110000100100': 1, '1101101000000000': 12, '0001001011111111': 1, '0101111010
110101': 4, '0000011011010101': 4, '0100011011010011': 2, '0111000110001110': 22, '0
110010111010010': 2, '0000001101010111': 6, '1011110010110010': 3, '100000100100100
1': 3, '0010100010010010': 1, '1100001011001010': 1, '1101011100101011': 4, '1010100
101101100': 28, '0010100101100100': 20, '0000100111010010': 1, '1000101011100111': 1
0, '0000001001111101': 10, '0111000101001010': 3, '1101001000011101': 5, '0100001110
101010': 1, '1000011011100000': 8, '0101101110100111': 24, '0101011000110001': 29,
'0010011011100110': 1, '1111010010100111': 24, '1000101001010000': 8, '0111110001000
100': 1, '1101001000101111': 1, '0010110111000101': 1, '0111000101011110': 1, '11011
11000001100': 43, '0010100111110011': 25, '1011110110110110': 1, '1010010000110100':
6, '0101111010010111': 28, '0111110100011011': 1, '0000101101001101': 31, '010110100
0101101': 5, '0010110011101011': 24, '0010010111100100': 1, '0101001100110101': 22,
'0100001110000011': 1, '1101001000101000': 5, '0100101011100010': 2, '000110101011010
00': 1, '1101011000000110': 4, '0000001001001000': 4, '1010000111001011': 17, '01101
00111010010': 3, '0000001000101111': 1, '1000001001001011': 4, '1101011100101001':
7, '0100001111111010': 1, '1010100101101000': 22, '1101001100000011': 8, '0010010010
001010': 7, '1000011011010101': 5, '0010100101111001': 24, '0000100111100011': 1, '0
111010001111100': 7, '0010000111011000': 6, '0101111000101011': 7, '101110001010011
1': 2, '0101011010010111': 28, '0110000101011010': 1, '1111000010101000': 2, '010111
1100111110': 4, '1100001101001100': 3, '0101110011010111': 7, '1110010101111101': 1,
'0110100111010000': 1, '0000011111101110': 5, '1000100101000101': 1, '11010110010110
10': 2, '1010110010110010': 4, '1010010111101110': 3, '0111100000000001': 5, '001011
0001110000': 16, '1101111011110011': 10, '1000001110000011': 8, '0001111000011010':

1, '0111111000001101': 1, '0000101010010000': 1, '1010100111101010': 23, '0111000111
111111': 1, '1101011110111111': 9, '1000101111110111': 30, '0011010010001011': 1, '0
111010011100101': 1, '1000011001110000': 21, '1010100010110110': 1, '011100001000001
0': 3, '1000001111001111': 20, '0111110001011110': 2, '1111010010111101': 4, '111000
0101101101': 4, '1111110110110100': 1, '1101001101101101': 3, '00000110111010011': 3
1, '0101011010110110': 27, '0100101101010100': 1, '1111000110001111': 18, '010100111
1111110': 8, '1010100101010000': 13, '1010110001000101': 28, '0111010011111011': 5,
'0001011010110110': 5, '0111000010110010': 4, '1010110011011001': 10, '0000111101100
111': 1, '1101101100001100': 21, '1000010001110000': 1, '0010000111010010': 29, '111
0110111010100': 1, '1000001101000100': 22, '0111000000010101': 3, '0001011000010001
1': 3, '0111100001001101': 1, '0110100111000111': 2, '1000101110000001': 3, '0111110
000001001': 14, '0010000101110101': 30, '1110110001001100': 2, '1010100000000000':
3, '1000011010100010': 5, '1000111001001011': 3, '0000011110101010': 2, '00100100010
11111': 5, '0101011111001111': 1, '1110100111110011': 1, '0111010111010011': 1, '100
0011011101001': 10, '1110110011111111': 5, '0101101110010110': 19, '110111100001101
1': 5, '0111110010101101': 9, '0001101100000000': 4, '1101001100000101': 22, '001001
0001001100': 22, '0010100001100101': 8, '0100111010111110': 1, '0100101011110101':
1, '1101101100111110': 4, '1101011000110001': 27, '0111110010111011': 21, '010110110
0001101': 30, '1000011010000111': 8, '0110010001111111': 1, '1111000101011010': 1,
'0101101111001001': 1, '0000101111100110': 24, '1010110110000110': 2, '0101101011000
110': 1, '1000101001001101': 8, '0110110011100111': 1, '0000010101101101': 2, '00101
00111101110': 29, '0111100010010110': 5, '0000111011001111': 26, '1101001110000111':
19, '0010010011111111': 23, '1110100011011010': 1, '1000101101110001': 19, '01111001
00100100': 30, '0010110111110110': 3, '0000101011101011': 4, '0000101101000100': 28,
'0101101000100100': 7, '0111110100010010': 3, '0101000110001111': 1, '10001011100111
10': 4, '1010000100101000': 5, '0111100011110011': 3, '1010000001100001': 5, '010000
1011010010': 1, '0010110011100010': 28, '0101101111011010': 4, '1100001111100111':
3, '0001001100010001': 3, '0111110000001000': 21, '1000101110000000': 1, '1101111011
001111': 5, '0010110000001100': 11, '0010000101110100': 17, '1000011010100011': 4,
'1000111001001100': 27, '1010100111000000': 6, '1111110010000110': 18, '011101000000
0011': 5, '0010000110101111': 5, '0111000110011110': 28, '1101011010110110': 21, '00
00001010001111': 4, '0000011001011100': 28, '0101101011101110': 1, '010101111011001
0': 6, '0000101111001110': 23, '0010010001000010': 4, '1111000001101000': 2, '101001
0110001111': 5, '0101011010101100': 3, '1110000010110010': 2, '1111010111111011': 3,
'1001111001111000': 2, '1101111000100100': 28, '0010100111011101': 13, '110111101110
1010': 7, '1111110000001001': 29, '1010100010101101': 1, '1101111111010010': 3, '110
1111000011010': 11, '0101101110010101': 5, '1010100011011110': 8, '111111000111011
0': 1, '0101001100110011': 1, '0010010111100010': 4, '1000100111111001': 1, '1000001
101011111': 4, '0100001110000101': 1, '0000101001101100': 11, '0001101010110010': 3,
'1101011000000000': 21, '1000001111011001': 3, '1111000111100110': 1, '0010100100111
101': 1, '1000001001000000': 2, '1101001100001010': 6, '0100001111110011': 3, '01010
01100111001': 27, '0010010111101000': 1, '1111010010101110': 22, '1101001000100100':
6, '1000101001011011': 1, '0111110001001111': 2, '0010100111111010': 21, '1101111000
000001': 25, '0000001001000100': 8, '1100111011001110': 1, '1100001101101000': 1, '1
011000110011000': 1, '1010010010000111': 8, '0011010010011111': 2, '110100101010000
1': 2, '0010000111111001': 4, '0000011001011111': 7, '0101011110110111': 7, '0010010
001000111': 5, '1111000110000110': 17, '0100101101011101': 3, '1010010101110010': 2,
'0101011010111111': 29, '1101101110011000': 9, '1101001110101110': 15, '001011010110
1001': 9, '0010010010110101': 1, '0000001111001110': 18, '1010100101110110': 5, '101
0000101100011': 7, '1101101110100110': 26, '1111000110100011': 17, '000000100110000
1': 6, '0001011001011001': 1, '0111010010111101': 4, '1000101111101111': 19, '110100
1000000001': 5, '1010000011011000': 3, '1101111011110110': 8, '0010110001110101': 3
0, '0111100000000100': 9, '0100001001100101': 2, '1101101111111110': 4, '00100011110
01001': 1, '1111000100010001': 34, '1010000100111111': 1, '0001111000011101': 1, '10
00001110000110': 10, '1111010100101000': 5, '1010100111101101': 7, '110111100010000
1': 31, '0010100111011010': 28, '1111110010010100': 8, '1000001011010000': 5, '01010

01100011001': 21, '1111100100100111': 7, '1111000101001110': 1, '1010000100000100': 9, '1000111001011001': 28, '0010010001000101': 17, '1111010000111001': 32, '11011111 11011101': 1, '1100111000011001': 2, '1000001110110111': 5, '0101111001011100': 8, '0000111111101001': 1, '1111010011000001': 1, '0111100101010101': 9, '10001010011100 10': 2, '1110100101000000': 1, '1001011010111010': 4, '0101111010001011': 14, '00011 01110000001': 1, '1011110110101010': 1, '1010010001001100': 17, '1111100101100101': 1, '0101011011101011': 8, '0111010010000111': 19, '1100001010000011': 1, '1110010011 110101': 2, '1100011011011100': 1, '0110110001001110': 1, '1101011001111100': 7, '10 11000110111010': 1, '0101011001111101': 6, '1111100111010111': 5, '010110100110010 0': 1, '1000111001010010': 9, '0000101100000100': 3, '0010000011011000': 2, '1000101 011111110': 6, '0000001110011000': 1, '0000111011101010': 17, '1010010001101101': 2 6, '0000011010001110': 6, '1101111100101010': 2, '1000011001011101': 22, '0100101111 000110': 2, '0010110110101001': 1, '0111110000101000': 21, '1001001010100110': 2, '0 010100111000011': 16, '0101001001110101': 1, '1101111001011100': 4, '110100100101110 1': 5, '1101011000011110': 4, '1101101100011001': 34, '1101101000101100': 7, '001111 0001100000': 1, '1111010000101100': 23, '1110010000001000': 2, '0111110011101011': 6, '0111000010001011': 8, '1100011011100111': 2, '1010100010111111': 2, '10101101101 11011': 1, '0101101010011011': 16, '0101111011100010': 3, '1101101001010101': 2, '10 01011000011011': 2, '1000001010001011': 3, '1111100000101101': 7, '0101011000100111 1': 6, '0111000101111010': 1, '1000101111101001': 8, '1101110000100000': 1, '1101101 000001101': 8, '1111100011001111': 1, '0110100011010011': 1, '0000001011000100': 5, '0101111010111010': 25, '0100011011111011': 4, '0000001101111111': 4, '0101011011110 101': 2, '0101001100001011': 8, '0010010111011110': 3, '1000101110100011': 4, '01010 11001101000': 3, '0000011000100101': 4, '1111110000000100': 23, '1010010001111100': 18, '1001011010111011': 4, '1110110100100100': 1, '1000101001110001': 6, '1111010011 000010': 3, '0111110001100101': 3, '0111100101010110': 1, '0110110001110100': 5, '11 11010001001111': 1, '1111100010011010': 12, '0101101010011010': 11, '100110110001111 1': 2, '1010110110111010': 1, '0101111011100001': 1, '1101101001010110': 1, '1110010 011001011': 2, '1100011010101000': 1, '1111100100101001': 16, '0000001101100011': 1 0, '1111100100110010': 4, '0000001101110100': 13, '0101011100111001': 5, '0000111111 111101': 2, '0010000101001010': 9, '0111110110110101': 1, '1001001100001111': 1, '00 01101100100001': 4, '1110000100111001': 1, '0100011110001110': 1, '011101010010100 0': 4, '1110100001010001': 1, '1000110010101010': 1, '1101111010110110': 20, '001011 0000110101': 8, '1101111001010001': 11, '0010100111001010': 25, '1100011100000000': 2, '1111100110010110': 29, '0100001111100110': 2, '0101001100011010': 7, '0010000111 100110': 25, '1000111110001101': 2, '0101001110100110': 23, '1110010001010101': 2, '1010010110100000': 2, '0000011000110000': 5, '1000111011011000': 5, '00001011101000 10': 5, '0110000101101101': 2, '1010110101011000': 6, '1101101000110000': 6, '111010 0110000110': 2, '0010100110000000': 2, '0010010101001000': 6, '0011100100010100': 1, '0000001101101001': 27, '1111000101001010': 1, '1010000100000000': 3, '1111100100100 011': 6, '1010100110110010': 4, '0111000111000111': 2, '0101001010111100': 3, '11110 10010011110': 23, '0100100001011001': 3, '1111000101110010': 2, '1111110011110111': 8, '1010000000010000': 2, '1011010000001111': 2, '1010100101011001': 21, '1101001100 010100': 22, '0110000111001111': 2, '0001111010101001': 1, '0000001100110100': 3, '1 111010110111110': 6, '0111110000000111': 12, '0111100100110000': 16, '10001011010001 00': 33, '0101001000101001': 6, '0010010101010110': 1, '0101001111000111': 9, '00101 10110001000': 2, '1010100100000100': 3, '1010110000110011': 2, '1000111111111011': 9, '0111001111110110': 1, '1101111110111110': 9, '0000101110011111': 5, '10101101110 11111': 4, '0010100100100000': 3, '1101011100010101': 4, '1100011001101100': 5, '110 1111110001000': 2, '1101001010010011': 5, '1101011011101100': 3, '0000100011110010': 1, '1001011010000111': 3, '0000101000001001': 1, '1111100000101111': 4, '00010011101 11000': 1, '0101011000100101': 24, '1011100100001001': 2, '1111000001111010': 1, '11 01001110110011': 17, '0101011100000101': 7, '0101101110111111': 24, '101000000000011 0': 1, '1111110101101001': 3, '0111110100010011': 5, '0000101101000101': 22, '010110 1000100101': 4, '1000101110011101': 2, '0111100100001010': 7, '1001001100101100': 2, '1111110010000010': 25, '1000101111001101': 5, '1101001100111001': 20, '100000110111

1011': 6, '1010010011010111': 25, '1101111100101001': 10, '1101010010100010': 3, '01 00001010101110': 1, '0111000110010111': 29, '1100011000011101': 1, '111110001000001 0': 9, '1101011010111101': 3, '1111110010101101': 7, '1101111100011101': 8, '1000011 111000111': 2, '0010110110100110': 3, '0111110000100111': 6, '0111100100010100': 25, '0100101111110010': 2, '0111010110100101': 4, '1010000111011101': 5, '10001011110011 10': 34, '0011100011001111': 1, '1111110010000011': 16, '0010110000101001': 9, '0000 111101101000': 5, '0111010001111111': 3, '1011010010001101': 1, '1111010100001001': 4, '0000011101001100': 5, '1000111111010000': 2, '0000001011100101': 3, '01101000101 10110': 1, '1010110001010010': 4, '1010100101100001': 27, '0010000101001100': 20, '0 111110110110111': 6, '0000111111111111': 3, '0111110011001010': 3, '001011000110100 1': 21, '0111100100001011': 6, '0101111000001000': 18, '1010110011110001': 9, '00001 01101101001': 16, '1000111001110011': 7, '0101101000001001': 4, '1110010101000001': 1, '1101010000111000': 1, '0000011110111111': 1, '0010010000001100': 10, '0100101111 010001': 1, '1000111011111101': 3, '0101101010101011': 12, '0000000011000110': 1, '0 010001111100001': 1, '0110100101100110': 1, '1111000101111001': 8, '010001101001111 1': 1, '0001101101011001': 1, '1101001010011101': 2, '1001111000101001': 2, '0111100 110001110': 23, '0010000001100001': 3, '0101011000010111': 6, '1101101100111011': 6, '0110110000001000': 1, '1101011000110110': 9, '0111110010111110': 27, '0001011000010 101': 1, '0111000000010001': 8, '1000101101101100': 26, '1111100001100111': 1, '1100 101101001101': 1, '1000001101000000': 32, '0000001110100111': 5, '0101001000100010': 1, '1011100100010001': 1, '0111111001101100': 1, '1101001111000111': 1, '10001101010 01001': 1, '0101101110010011': 34, '0000111001000010': 8, '1010110101101101': 5, '11 01011100100010': 1, '0000001100101000': 9, '1010100101100011': 5, '101011000101000 0': 19, '1101001100001000': 26, '0000111010010011': 4, '0000011101010001': 7, '00010 11010101110': 2, '0111000010101010': 2, '1110100111000011': 3, '0111010110100011': 1 1, '0100101111110100': 1, '0110100101000111': 2, '1010000111011011': 22, '0001101101 000101': 1, '1111110001111101': 6, '1010100011010111': 8, '0000101001100001': 5, '10 00001101010100': 18, '0100011011101010': 4, '1111100101001100': 1, '111100010110010 1': 2, '0000101111001001': 5, '0011000010110111': 1, '0110110111011011': 1, '0101011 001110100': 12, '0111010010011111': 20, '0111100000101100': 3, '1110110001111010': 2, '1111011010111111': 2, '0000111110001000': 2, '1111110000011000': 30, '0101111000 011001': 24, '1101101010100110': 6, '1001001010101010': 2, '0010110000101000': 1, '1 010010100101100': 3, '1000101010000011': 2, '1001001100101000': 2, '100000101111111 1': 6, '0111110000010111': 6, '0010100110100010': 7, '0111100010010000': 4, '1000011 011111111': 22, '1010100000111101': 1, '0011010011110110': 2, '0011010100001110': 1, '1000111011001110': 18, '1111010010110101': 7, '0111110001010100': 12, '011110010100 0001': 3, '0101110010001001': 1, '1000001111000111': 23, '1000001010101110': 1, '111 1110001001010': 3, '0101001000100011': 2, '0000001110100110': 11, '010010110101000 0': 2, '1111000110001011': 13, '0000001010110111': 2, '0110010011110001': 1, '110100 1011010111': 1, '0101011010110010': 32, '0010100110011110': 2, '0010110110001100': 1, '0000011011101111': 19, '0111000000100110': 1, '1101111001111001': 3, '0000111011 111101': 6, '1111100000010000': 10, '1111000110111000': 11, '1010000101111111': 7, '0111100110101011': 12, '1101101110111110': 28, '0010110001000100': 36, '01010011100 01110': 23, '1111110000111011': 8, '1100011000000001': 1, '1110100011100010': 1, '00 10110011000110': 22, '0010000001000100': 8, '0000111011010010': 31, '000111111111111 1': 1, '1111010110101010': 8, '0011010001110001': 1, '1010010001011001': 16, '101010 1011001100': 1, '0011010100010011': 1, '1000111010110011': 2, '1111000010000110': 4, '0010000111001011': 22, '1001111110011011': 3, '1101101110010001': 6, '1000101101111 000': 23, '0010000100000100': 2, '1111100110111111': 24, '1000111001111100': 20, '00 00111000100100': 3, '1010010111111110': 7, '0010100001011101': 4, '010100111011110 0': 5, '0010100101000010': 11, '1001101110111011': 3, '0100011001001100': 2, '000001 1001001110': 7, '0010000110100110': 5, '0111010000001100': 18, '1110010111001110': 1, '0000010000110001': 1, '0000011100011101': 1, '1000011011000110': 30, '1000111001 101111': 6, '0111110000111000': 23, '1101101011100000': 1, '0101111001010111': 1, '1 000001110111100': 3, '1111010011001110': 1, '0111100101011010': 4, '111010010100110 1': 2, '0110101010101101': 1, '1000101001111111': 1, '1010010001110100': 24, '000010

1001000101': 9, '1000001001010011': 1, '0100001111100010': 3, '0101001100011110': 3, '0010010111001101': 3, '1100101001100000': 1, '0000011011001100': 1, '1101001101001010': 1, '1111000101001001': 3, '1111000001000000': 1, '0000001101101010': 11, '1111000110101100': 9, '1100101111100111': 3, '1000111110011111': 1, '0000001001101010': 3, '1101001000001010': 1, '1000101111100110': 25, '0111010010110100': 2, '1101111001101101': 3, '0101011000101000': 22, '0101011010110011': 20, '0000011001100000': 17, '0011010100101000': 2, '1000111010101000': 2, '1010110011010011': 21, '0000011011110011': 21, '1101001110010101': 7, '0001101110010111': 2, '0001001110100010': 1, '0111000111101111': 5, '1111010010010000': 7, '0101001010110110': 5, '1101101101011000': 12, '0101111000010100': 28, '0001111000010000': 1, '1000001110001011': 12, '0111000111110111': 7, '1010100111100000': 4, '0000111001100000': 21, '0000011101100010': 4, '0110000001011000': 1, '0111110010101000': 7, '1101101100100001': 25, '0100111011000001': 1, '0110010011100010': 1, '0010001101010001': 1, '1010100110100101': 2, '1111100100110110': 5, '1100011101100100': 1, '0000001101110000': 19, '0010110000100100': 6, '0010110110101011': 2, '0111110000101100': 25, '1101001111111100': 2, '1111100100111000': 15, '1111110001101001': 5, '1000001011000101': 2, '1000111111011010': 8, '0000011101000010': 6, '1000011101110001': 4, '0100101110000011': 2, '1110110001011111': 1, '1101111010111011': 23, '1000111010101111': 5, '1000101111011010': 22, '1101100100010100': 1, '0111100101101000': 6, '0000111011011110': 29, '0111010110110110': 6, '1000101011000100': 3, '1111100110101101': 9, '0110100101110010': 1, '1010000110101110': 5, '0000010110111010': 8, '0101101000011010': 1, '1000011011000111': 30, '1010100011111001': 3, '0111100000100001': 7, '0111010010010100': 9, '0101101101101001': 5, '0010110000010000': 6, '1010100111011111': 23, '1000001111111001': 8, '1110000111000111': 3, '0010110010010110': 3, '1110100101000010': 1, '0111110001100100': 5, '1000101001110000': 5, '1111010011000011': 4, '1010010001111011': 9, '0100001101010101': 2, '0001011000100101': 2, '0111000000100001': 5, '1110000001110100': 1, '0111000101101000': 1, '1000001001111001': 4, '1101101110111011': 23, '0111100110101110': 17, '0101100100111001': 2, '1010000101111010': 5, '0100111000111011': 1, '1111100000010111': 3, '0101001110001011': 20, '1111010000000101': 17, '0101101101111100': 6, '0000011010000011': 9, '1000011001010010': 7, '0111000011010011': 3, '1100111011010010': 2, '0010010101111101': 9, '0101001111101110': 7, '1011110000101100': 2, '1101111100100001': 10, '1000011001010100': 16, '0110110110000001': 1, '0111100001101000': 1, '0100001001001001': 1, '0101001000111100': 6, '0010110001011001': 26, '1111100000000101': 6, '0111000100010000': 20, '1011011011110100': 1, '1001011000100101': 2, '0111010010000011': 10, '0111110000001101': 15, '0111100100111100': 24, '1110000011001100': 1, '1100001010101001': 2, '0010000101100001': 20, '0011000101001000': 1, '0110010011010000': 2, '1011100110101111': 4, '1010001111101100': 1, '0111110011110000': 1, '1111010000110111': 5, '1111110000001010': 7, '0000111000011000': 5, '1000011000000010': 1, '1101111101010101': 1, '1011000011101011': 1, '1011010010010010': 1, '1000111010001111': 6, '1000111110100101': 2, '1111110011100010': 2, '1000011100101110': 1, '0101111110011011': 6, '0101101110101100': 5, '1111100101011001': 6, '1000010101111110': 1, '0101011000111110': 7, '0100011011001111': 1, '1010010001000110': 6, '1101101011110010': 1, '0101111010000111': 18, '0000011001110001': 21, '0000101111100111': 16, '1010110110000111': 3, '0101101011000111': 1, '1100111010010011': 1, '0101101111001000': 2, '0010100111001101': 7, '1101111001010100': 12, '1110000101101100': 1, '1111110110110011': 5, '1101001101111001': 10, '1010110000100001': 2, '1000011010000101': 1, '1111000101011100': 6, '0110010001111101': 3, '1010110110000100': 1, '0000101111100100': 4, '0111110100011100': 6, '0000101101001110': 8, '0101101000101110': 2, '0010100110101001': 5, '1000101010001000': 1, '0111100100000001': 24, '1001001100100011': 1, '0111100100011001': 23, '0110000100111011': 3, '1101001100000000': 18, '1010110001011000': 28, '0100001111111011': 1, '1011100111110110': 2, '0001111100100100': 1, '0111010001000110': 1, '1110110010000011': 2, '0101101101110011': 2, '1110100000001110': 5, '0111110011001101': 1, '1101111010101001': 7, '0000011010001100': 2, '1111000100001000': 26, '1000011001011011': 3, '0111000101011000': 9, '1101000100100100': 1, '1101011000000101': 36, '0001111000001000': 1, '0000111110101010': 2, '0111010000100101': 19, '0111100110011110': 25, '1010100111011000': 7, '111110011

1111001': 1, '1011110000111000': 6, '0101101110001010': 25, '1111000110011001': 7, '0011010100000101': 1, '1000111011000101': 5, '0010010111111000': 3, '11110100101111 10': 36, '0111110001011101': 6, '0111100101001010': 1, '1101101100110101': 24, '1101 011000111010': 6, '0111110010110010': 34, '1000011001000000': 21, '111111010111010 0': 3, '0101011100011000': 8, '0001011111000010': 1, '1111000011011001': 1, '1000011 011001101': 6, '1000111001100100': 24, '0000101101110010': 4, '1010000110100110': 2, '1111100110100111': 24, '0111010110111110': 9, '0111010000111010': 6, '1010100001100 000': 4, '0000110001100100': 1, '1101001010110111': 6, '0111100110001010': 28, '0010 000001100101': 11, '1110000100100001': 1, '1011010010100100': 1, '1001101111001010': 1, '1101111010010011': 33, '0011010010110010': 1, '1100011111001111': 1, '0000001110 101011': 13, '0000111100000000': 1, '0001111110101111': 2, '1111100101010100': 8, '0 001111010101101': 4, '1010110111110000': 4, '1010110001001010': 8, '101010010101110 1': 16, '0011010111110000': 1, '0101101001100110': 1, '1000111001010000': 25, '01011 01101101011': 1, '0010010011000010': 19, '0111100111001000': 3, '1010000101010100': 17, '1010010010110011': 3, '0000101100001011': 1, '1000111001011101': 21, '000001100 1011001': 24, '0101011001110010': 3, '1111100111011010': 4, '0100101110001011': 2, '0000010001001111': 1, '1101111010110011': 20, '0010110000110000': 4, '0010110011000 101': 9, '1111110000111010': 7, '1111010001110001': 9, '0100111001001100': 5, '00101 10101001101': 5, '1111100100001010': 4, '1101101111101100': 3, '0000101001110000': 4, '1100111001010001': 2, '1101111110010011': 6, '0100011000000000': 1, '00000111100 00111': 2, '1111000000110101': 5, '1001011001010100': 2, '1000101011111010': 4, '101 1010100010101': 2, '0010110000111110': 1, '1101111010111111': 29, '011111000010101 1': 5, '0111100100011010': 8, '0010110000100101': 4, '0000100101101100': 1, '0110000 011111011': 1, '1101011011011110': 6, '0010110110110111': 1, '0111110000110000': 28, '0111100101100101': 2, '1110000101000001': 4, '0011110010100010': 2, '01011011111101 00': 3, '1010010001011100': 24, '0010010001000000': 18, '0101011110110000': 2, '1000 011000101000': 4, '0111101110011101': 1, '1000001000000110': 2, '1001011010010110': 2, '0011000110011010': 3, '0010110001011101': 23, '1101111011011100': 1, '1001001110 000110': 1, '1000101100110101': 3, '0010010111011010': 7, '0101001100001111': 15, '1 000101110100111': 7, '0000001101111011': 6, '1111100100111101': 27, '111111000010110 1': 17, '1101111101111000': 3, '0001001010001111': 1, '0111000001010101': 2, '001010 0100001110': 1, '1111000110110111': 25, '1000001001110001': 8, '0111110000011001': 2 6, '0111100100000100': 22, '1001001100100110': 2, '0101011011111110': 3, '1100011101 100010': 1, '1111100100110000': 22, '0000001101110110': 10, '1101001101010110': 1, '1010100110100011': 8, '0000111011010101': 8, '1101100100011101': 1, '11011011011010 01': 4, '0001111100110001': 1, '1010100010001111': 6, '1101001100010101': 18, '10101 00101011000': 30, '1010110001011101': 24, '1000111000110001': 5, '0111010001101001': 2, '1101011000011100': 21, '0011100110111110': 5, '1111110000010001': 19, '000010110 0001001': 6, '1011010011000110': 1, '0101011110110011': 3, '0000101111001101': 7, '0 101000110110101': 1, '0000011001011011': 8, '0101011010010000': 7, '001010000011100 1': 5, '1000001100011101': 3, '1101011010000110': 23, '0000111000001100': 6, '100010 1100011001': 2, '0011100010110011': 1, '1000101111010110': 29, '1011000100110000': 3, '1011010001110001': 1, '0011000110100101': 1, '0010100111010111': 25, '0010010101 011100': 5, '0101001111001011': 3, '1101101110011011': 21, '1101001011011001': 1, '1 100011111101011': 2, '0010000111000001': 4, '1100001110010010': 1, '0000001010111001 1': 1, '1000111011011111': 25, '1111000100110000': 19, '1100101101111101': 6, '10010 01110001111': 4, '1000101100111110': 1, '0011000110010001': 2, '0010110001010100': 1 8, '1101111011010011': 6, '1010000011110111': 8, '0100001001000100': 2, '11011001001 11110': 1, '0000100001011101': 1, '0110110011100011': 1, '0010100111101010': 19, '11 1111010100011101': 6, '1111110010111011': 27, '1110010010101010': 2, '100011100000110 1': 6, '1001101100111110': 2, '1101011010010100': 8, '0110100111101110': 3, '0101001 010111111': 7, '1100111010001010': 1, '0000101111011110': 21, '0101101010111110': 6, '0100111001000100': 5, '0000001100000000': 4, '1111100001001100': 2, '11111001000001 10': 4, '1000001000101010': 1, '0010110101000011': 2, '1100111001011111': 1, '110100 1100100000': 30, '1010110001111000': 25, '0111100111100100': 3, '1110100111010001': 1, '1010100000100110': 1, '1111110010101010': 23, '1010111111110111': 1, '1000101101

100100': 21, '0111110011100011': 5, '1111010000100010': 5, '1101011001101111': 1, '1110110010101110': 1, '0111000010000011': 5, '1000011001110001': 19, '1100011011101111': 3, '1010100010110111': 1, '0100101011110011': 2, '0001101011100101': 1, '0111110010111101': 7, '1101011000110111': 3, '1000000101000001': 1, '1101101100111100': 21, '1111000110101010': 22, '1100101111100101': 1, '0000001001101100': 12, '0001001110110111': 1, '1101111001101111': 1, '1101001000001100': 6, '0111010010110110': 27, '1000101111100100': 5, '0011010010100011': 4, '1111010010101011': 16, '1101001000100011': 1, '1000101001011110': 2, '0010100111111111': 31, '1101111000000110': 4, '0111000101010000': 8, '0101011111101111': 2, '0111100101111000': 7, '0000111000111110': 1, '1000011001101100': 28, '1010100011001010': 6, '1111010100110000': 5, '1101011101111101': 3, '1111010010111001': 7, '0111110001011000': 6, '0000001101011100': 20, '1110000101101001': 3, '0111000110000001': 10, '1101001101111100': 5, '0000011011011010': 26, '0010100100010000': 4, '1101101110101001': 12, '0100111000001001': 1, '1111110110011110': 4, '1100111111000010': 1, '1001101110111010': 5, '0000101110111101': 1, '0010100101000001': 27, '0000011001001111': 9, '1010010011111010': 37, '0010000101010000': 21, '1001111000001011': 1, '0000011001111001': 26, '1101111010011011': 19, '0101001111100111': 7, '0010010101110110': 2, '1111001110011111': 1, '0111110010011010': 29, '1111010100001111': 3, '0010000111011011': 19, '0111010001111001': 9, '1101101100000011': 6, '0111000110110110': 26, '1100011101101000': 2, '1101001111111010': 2, '0101011100110001': 7, '0010000010011010': 1, '0000001111011010': 17, '0010010011100001': 7, '0100011011111000': 2, '1010010001000000': 28, '0001101110001011': 2, '0101111010000001': 8, '1011010110110011': 2, '1101101110001101': 1, '1001111010110110': 1, '1001101110111110': 3, '0010100101000101': 23, '1000011101001110': 1, '1110010010110011': 1, '0000111001011111': 8, '1001011110101010': 2, '0010100011000101': 4, '0010010010001000': 3, '0111110110010100': 1, '1010110110100010': 3, '1010110010011110': 4, '1101101000000101': 3, '0000001011001110': 6, '0101111010110000': 4, '0010010000100100': 5, '1001101110011111': 1, '0000011111010001': 1, '0111110100111000': 8, '0101011111010100': 1, '0101001110110111': 26, '0010010101100100': 7, '0010100001010000': 7, '0010110011010111': 16, '1010000100111001': 3, '0111100010100100': 2, '1111010010001110': 17, '1111000111001001': 1, '0000011111000111': 5, '0010010001110100': 22, '0101011110100100': 3, '0000101111111010': 16, '0000011000001100': 5, '1111100100001111': 9, '0010110101001100': 4, '1101101111101101': 4, '0000101001110111': 1, '1101101010111000': 4, '1010000111110111': 26, '0101101100100000': 21, '1100101011001011': 1, '0010110010101110': 9, '1111000110000111': 25, '1101001011011011': 1, '1100011111101001': 1, '1101101110011001': 7, '1101001101100101': 4, '0000011011100011': 24, '0010110110000110': 1, '0010010101011000': 9, '0000001101000101': 24, '0000111111001011': 2, '1001111111101110': 1, '1101001110010111': 26, '0001101110010101': 2, '0000011011110001': 7, '1010010101000001': 8, '1111110000101000': 29, '1101111101111101': 2, '0101011000000110': 7, '0010011011010111': 2, '0111110110101110': 8, '0111000000111100': 7, '0001101100011010': 1, '1000101100110100': 3, '1001001110000111': 4, '1101111011011011': 7, '0010110001011110': 9, '1010000011111111': 10, '1100101101110101': 4, '1111000100111010': 3, '0010010011001010': 15, '0111100000101001': 5, '0101101101100001': 2, '1010100011010110': 7, '0010010111101010': 8, '1111010110000011': 9, '0101110010110110': 1, '0101111010100101': 6, '1000001101100111': 5, '1011010000111001': 3, '1010011010100100': 1, '0010000100111101': 7, '0000011000011010': 1, '1111000101110100': 4, '1111010010011100': 3, '0101001010111110': 4, '1000111111111110': 4, '1110100000100000': 1, '1000011011111010': 26, '0111100010010111': 8, '1010100000111100': 2, '1000011010100100': 3, '1000111001001101': 19, '1110010011100110': 2, '1111110011110101': 3, '1010100011101001': 3, '1100001110000011': 1, '1010100010100110 0': 20, '0000111111100101': 5, '0111100101011001': 4, '1011010001100101': 1, '1010100001100101': 8, '0111010000111101': 18, '0010111001101001': 1, '1010100011010001': 2, '1111110001111011': 2, '0010010111101111': 4, '0010110010000111': 5, '1111000101100011': 1, '1111100101001110': 1, '0000111011000101': 7, '1000011011110011': 24, '1010100000110001': 1, '0111100111010111': 10, '1010010101011111': 2, '0101010000011010': 1, '1000101111011011': 25, '1010110011001001': 4, '1100111011100011': 2, '1101111100001000': 10, '0000111001100111': 7, '0000011101100101': 5, '0110100100011111':

2, '1101101100100110': 4, '1010100111000110': 30, '0010100010001010': 2, '0110110011010010': 5, '1111000111111111': 5, '1110000101101111': 4, '1111110110110110': 4, '0000111100001100': 5, '0111010011000111': 8, '0101101100000110': 8, '1101110010110010': 1, '0110100001000001': 1, '1111000101010011': 1, '0110010001110100': 2, '1000011010001110': 8, '0000101111101101': 4, '1011000000110000': 2, '0010000100011100': 5, '1010011011000011': 1, '0001011100011101': 2, '1010110001101100': 16, '1111000110101001': 4, '1001011000010111': 3, '1000001010000111': 3, '1111100000100001': 4, '0101011000101011': 4, '1101111100010111': 2, '1000011001001000': 23, '0101111011111111': 1, '0011110000000100': 3, '0011000101011001': 2, '0010000101010110': 8, '0001101110001010': 1, '1010010001000011': 6, '0101111010000010': 27, '0101011011100010': 5, '1000011011111000': 13, '1111110001011111': 1, '1111110010111001': 11, '0101011000011101': 27, '1111110010110100': 10, '0010100011011001': 4, '1001101011011010': 1, '1101011010011011': 22, '0011100110110110': 3, '1111110000011011': 5, '1010100111011011': 17, '0010110010010010': 2, '1110000111000011': 2, '1010100111101001': 7, '1111010100101110': 2, '0000101101010111': 4, '0111110100000101': 10, '0001111000011001': 1, '0101101000110111': 6, '0010110011010101': 2, '0001011110100111': 1, '0101011101110001': 3, '0100111001111000': 2, '1101101111111000': 1, '1010000001010100': 3, '0111100010100110': 5, '1100111000100100': 1, '0100101111001010': 3, '0000011010000010': 6, '1101111100100110': 1, '1000011001010011': 4, '0111110011000101': 1, '1111010000000100': 26, '0011000100100000': 1, '0010000101001001': 36, '0111011010110110': 1, '1111010000001101': 21, '0111110011001110': 14, '0011101100000001': 2, '1101111101010100': 5, '0000011010001011': 8, '1111000100001001': 20, '1101111100101111': 1, '1000011001011100': 18, '0100101111000001': 1, '0100101101010010': 2, '1010010101111101': 10, '1101001011010101': 1, '0101011010110000': 3, '0001011000001111': 1, '0111000100001100': 23, '1111110010011001': 7, '0101001100010100': 25, '0000001101100000': 29, '1111000001001010': 2, '1010000100001001': 6, '1000001110001010': 6, '0100001100110100': 1, '1010100111100011': 25, '0111000111110100': 3, '0111110111001011': 1, '1101101010101000': 3, '0101111000010111': 2, '0101011000110100': 17, '0101101110100010': 20, '0111010011001000': 1, '1101001101110010': 1, '0000011011010000': 6, '1111110110111000': 2, '0111110000011111': 8, '1000001011110111': 5, '1000101010001011': 2, '0010100110101100': 2, '0101100110110111': 1, '0101111000000001': 26, '0011110011011011': 1, '0101111000100000': 31, '1001011010100010': 5, '0000001111001101': 10, '0010010010110100': 1, '0010110111101110': 6, '0111100101100110': 2, '0111110000110011': 8, '1101011011011111': 5, '0000100101010100': 1, '0000011000110111': 1, '0100011001110001': 4, '0010010100110000': 3, '0101001110100001': 5, '0000111011000111': 37, '1000011011110001': 4, '0011000010100010': 1, '0101001010000011': 3, '1101101011010101': 1, '1101111011110101': 4, '0010110001110110': 6, '0101111000011100': 29, '0000011010101011': 10, '1010110001111101': 22, '1100011000110000': 2, '0111110011000110': 2, '0010110011110001': 8, '1000001101011110': 3, '0100001110000110': 2, '1010100011011111': 8, '1111110001110101': 6, '0101001100110000': 30, '0010010111100001': 2, '0010010001001011': 12, '0000101111000101': 6, '0101011110111011': 6, '1000111010011101': 3, '0111010100010001': 6, '0010000101101101': 19, '1100001101011000': 2, '1111000100100100': 25, '0110000111000011': 1, '1010101110000100': 1, '1101001100011010': 3, '1010110111111000': 5, '1101001010100100': 1, '0001111100111110': 1, '1010110001010111': 3, '1010100101100100': 27, '0001111010110100': 1, '0111000010101111': 7, '0001011010101011': 1, '0000011010101110': 8, '1010110001111100': 24, '1101111010000011': 27, '0101111100001100': 5, '1110010111000001': 1, '0000101110101001': 2, '1000111011010011': 16, '1111110110011011': 8, '1000101110111110': 6, '0111000011100111': 1, '0111010101000101': 1, '1110100101100101': 2, '0111110010000111': 25, '1111010011100100': 1, '1111100100111010': 9, '0010110110011111': 3, '1010010000111101': 5, '1010000001000000': 5, '1101001110101100': 4, '1010000101001001': 26, '0010110011011010': 24, '0000000011100011': 1, '0001011110101100': 1, '1100101011011101': 1, '0111100010101011': 1, '1111000100011000': 24, '0100001011101010': 2, '0001101100111000': 4, '0001001010000010': 1, '1111110000100000': 29, '1010010101001001': 7, '1000001101100101': 23, '1010001111001010': 1, '1111000101110110': 1, '0000011000011100': 7, '0110100101101001': 2, '1111010010011010': 25, '1101001111001000': 3, '010110100101110':

0': 3, '0000101100111100': 3, '1000101101000000': 32, '0101011000110010': 9, '010110
1110100100': 1, '0010100011111011': 12, '1000101111110010': 28, '1101011110111100':
3, '0111111000011010': 2, '0001111000101011': 1, '1010100111111011': 24, '1011100000
101111': 1, '0001001111000011': 1, '1000110011010011': 24, '0000110001001101': 1, '1
000111000011100': 2, '0111100111110111': 5, '1101101111000110': 5, '001011010010010
1': 1, '1111110011001010': 2, '0101001110010110': 25, '0000111001011001': 20, '01101
00111000000': 2, '0011010010010010': 4, '1010010010001100': 4, '0010110101010001':
5, '1010110001001000': 25, '1101001100010000': 23, '1000001101110111': 1, '101001001
1011011': 18, '0010010001001001': 32, '1010010010111011': 5, '1000111001010101': 18,
'0111100010001011': 3, '0011110000110100': 2, '1000001111001001': 3, '00001111110100
11': 7, '0101001100101110': 5, '0010010111111111': 3, '0000011011011100': 7, '010001
1011011110': 3, '0111000110000011': 19, '1101111101000101': 1, '1101001010100000':
1, '0010000111111000': 6, '0001001101011000': 3, '1000011111111011': 2, '10100001111
01111': 27, '1110000111100010': 2, '1000111011101110': 28, '0110000011000100': 1, '0
000001001011010': 2, '0111010001100001': 4, '1101101100010111': 2, '100011110100110
1': 7, '1110110011011111': 3, '1000011101100011': 1, '0000111001110100': 21, '110100
1000011011': 2, '0101101110011001': 3, '1000011011100110': 27, '0101011010111010': 1
4, '0101010000010110': 1, '0110010011111011': 2, '0000001010111101': 1, '11110001100
00001': 8, '1010010101110101': 10, '1101001101100011': 1, '1011000010111111': 1, '00
00011011100101': 8, '0010100110010110': 4, '0010110110000000': 2, '000000110100001
1': 6, '1001111100000110': 1, '0000111101000011': 1, '0101011110010000': 2, '1101111
010111110': 21, '0010110000111111': 2, '1110110001011010': 1, '1011000100111000': 3,
'1010101101101101': 1, '0000111010101100': 8, '1101111010110000': 7, '00101100001100
11': 1, '1101000111010110': 1, '0111000010010011': 7, '0000011010010010': 3, '111101
0000010000': 25, '0111110011010011': 4, '0101111011001111': 4, '0010110001011011':
9, '0101001000111000': 6, '1101111011011110': 2, '1000101100110011': 1, '01110000001
11101': 5, '0111110110101011': 5, '0101011000000001': 27, '1010110111111110': 6, '10
10110001000100': 28, '1010100101010001': 30, '1101101110000100': 8, '000001100100001
0': 6, '0100011001000100': 3, '0101101011010000': 1, '0010100101001110': 7, '0010100
111110111': 26, '0111000101011010': 1, '1101001000101011': 1, '1111010010100011': 1
7, '0111110001000000': 4, '1000101001010100': 6, '1010010000100110': 5, '01110101001
11111': 1, '1000001111101100': 7, '0101011010011010': 31, '1100001101000101': 2, '01
01111011011010': 9, '0101001111001101': 1, '0110100101010101': 3, '0010010101011110
0': 2, '1101001110000100': 4, '1101011111011101': 1, '0100011011001000': 2, '0000001
111001011': 28, '0010010010110010': 5, '0000001111100100': 7, '1101001101011101': 2,
'0000001111011001': 9, '1010010000010000': 5, '1101001111111001': 2, '01010110111101
11': 3, '1111100100111011': 10, '0010110110011110': 4, '0000001101111101': 15, '1100
101101110111': 2, '1111000100111100': 25, '1000010101000100': 1, '0101011000000100':
28, '0000111011101011': 25, '0111110110110100': 2, '0000111111111110': 5, '111100010
0000000': 25, '0100101111001000': 3, '0010110001100100': 30, '1101000111000111': 1,
'1101111010100001': 4, '1101101110110000': 9, '0010110100010101': 3, '01111001101001
11': 19, '1010000101110011': 2, '1010010101101110': 4, '1111000110011010': 22, '0111
000110000101': 6, '0100011011011100': 1, '0000011011011110': 24, '1111010000111111':
12, '0111110011111010': 3, '0000011111110010': 7, '0110100100101101': 1, '0101001010
001000': 2, '1010000111110001': 5, '0101011010010011': 26, '1101110000001011': 1, '1
000111110110011': 1, '0010110011101101': 1, '0101011000111100': 20, '0101101110101111
0': 17, '0111100000010100': 6, '0011000111011011': 1, '1010000011100110': 5, '010100
1110001111': 23, '0111100110101010': 20, '1101101110111111': 27, '0000001000011001':
2, '1010000101111110': 7, '1000001101100010': 5, '1000110010111000': 1, '11101100110
01110': 2, '0110100110000011': 1, '0010010110001100': 2, '1101011110000111': 3, '011
0010000110111': 1, '0000001101011011': 7, '1111100000110110': 2, '1000011011101101':
5, '0111010010100010': 24, '0111000011101011': 3, '0100110001111011': 1, '1111010011
101010': 7, '0111110010001011': 21, '0011100110100111': 1, '1101001010001111': 7, '0
101001000000101': 5, '1101111100111101': 5, '0111000010011010': 8, '000011100101110
0': 22, '1111110100001001': 9, '0111010101110111': 1, '0111110001110101': 5, '100010
1001100001': 11, '1110100101010111': 1, '1100111011110100': 2, '1000111011101101':

8, '0000011100100101': 2, '0001001010111010': 2, '1000011110010010': 2, '10110001100
11111': 3, '0000111101100001': 4, '1101101100001110': 8, '0010000111010100': 4, '111
1010100000000': 7, '0100111010101110': 1, '1010100101111101': 23, '101110011010001
0': 5, '1101001100110100': 22, '1010100111001101': 7, '1000101111000100': 4, '111111
0010001011': 22, '0111100111110000': 3, '0010110100100010': 1, '1101101111000001':
3, '0010100101111000': 19, '0111000110101100': 6, '0100001101001100': 5, '0111100100
001000': 34, '0111110000010101': 29, '0010100110100000': 3, '0101111000001011': 6,
'0101000110110111': 2, '00001011111001111': 31, '0101011110110001': 1, '0101101011101
111': 1, '0010010001000001': 26, '0010010001110110': 8, '0000011111000101': 2, '0101
001011001110': 1, '1000111001001000': 21, '0101101001110010': 1, '0111100101011111':
2, '1110100101001100': 2, '1000101001111010': 2, '0111110001101110': 1, '01110101011
01100': 2, '1111010011001011': 3, '1001011010110010': 3, '0000010101011010': 2, '101
0010001110011': 3, '1000001110111101': 1, '0101111001010000': 13, '100010111111011
0': 20, '1011010110011111': 2, '0000000111011110': 1, '0001001111000111': 1, '101010
0111111111': 23, '0000011001100100': 27, '1010110100010010': 1, '0010010110000001':
1, '0110100110001010': 1, '1101011110001110': 4, '1010010111010100': 1, '10001111011
10101': 8, '1100111001100001': 6, '1010110111111010': 7, '1010110001000000': 16, '10
10100101010101': 10, '1101001100011000': 21, '1000001001110110': 1, '000000010000100
10': 2, '1111000110110000': 5, '0010100100001011': 1, '1101111001110001': 5, '0111000
101100111': 1, '1101001001110010': 1, '0100001111000111': 1, '1010110010001010': 12,
'1111101100000100': 1, '0010100011101010': 4, '1000011001101000': 26, '1000111110101
010': 2, '1111110011101111': 2, '1000011100100001': 1, '0101111110010110': 9, '10101
10011000100': 6, '1111100111100001': 1, '1000101111111001': 9, '0101111000101110':
4, '0011110011010111': 2, '1000101110110100': 1, '0111000011101111': 1, '01110100101
00110': 32, '0111110010001111': 25, '1111010011101110': 6, '0111010101001101': 1, '1
110100101101101': 2, '0010110011001101': 7, '1111110000110000': 24, '011101001010111
11': 17, '0111000011100110': 3, '0111110010000110': 20, '1110100101100100': 3, '11110
10011100101': 2, '1001011010110111': 7, '1010010001110110': 1, '0111010101101111':
1, '1110100101001111': 2, '1000101001111101': 11, '0111100101011100': 6, '1000001110
111010': 3, '0101111001010101': 15, '1010100011000111': 3, '1000011001100101': 22,
'0010100001110101': 3, '1101011010000000': 6, '1011000110100010': 3, '10101100010101
00': 25, '1010100101100111': 10, '1010100101101111': 4, '1010110001011110': 8, '0000
111001111110': 8, '0000011101111100': 8, '1000011101101011': 2, '1110110011010111':
1, '1101001000110000': 7, '1101111000110011': 6, '0101101111001101': 3, '10010110001
11111': 1, '0001111000110001': 6, '0010100010110000': 1, '0000101000000000': 3, '110
1101001101101': 2, '1000001101110101': 15, '1111100110011010': 41, '101111001111111
1': 2, '1010110001111001': 22, '1101001100100001': 22, '1101111110011110': 8, '11010
10111100010': 1, '0100001010001111': 1, '1010100111010110': 26, '0101011000010110':
8, '0110010010010011': 1, '0000001100101001': 5, '1101011100100011': 1, '10101100010
10001': 17, '1010100101100010': 7, '1101001100001001': 21, '0010100101111111': 5, '0
000101011000010': 3, '1101011101101010': 1, '0111110110010010': 2, '100110110000100
1': 3, '0000111111011011': 5, '0101000000000101': 1, '0111100010000011': 7, '0101001
100100100': 15, '0010010111110111': 10, '1010010101100010': 1, '1111000110010110': 2
2, '1110110011000010': 6, '0000011001100001': 34, '0110010010001010': 2, '1101011100
111010': 5, '0111010001011110': 3, '1101101101101100': 2, '0010111011001110': 1, '00
10000111110010': 17, '0000011101100001': 9, '0000111001100011': 8, '001001111101011
1': 2, '1111010100111101': 6, '1101011101110000': 3, '1010100110010011': 1, '1011010
111110011': 1, '1010000111110011': 14, '0101101100110001': 24, '0111010000000101': 2
6, '0110110101010001': 1, '0010111011110101': 1, '0101111100001010': 2, '00110101011
10001': 1, '1000111011010001': 8, '1010110000010011': 4, '1010100100100000': 5, '101
0110111000111': 5, '0101101010000111': 7, '1111100111101110': 2, '0001001011010000':
1, '0110110111001111': 1, '1100011111101110': 1, '1101101110011110': 23, '0010000111
000110': 29, '0000001100010000': 5, '1101001100110000': 21, '1011100110100110': 2,
'0111000111101101': 3, '0001001110100000': 1, '0111110000000010': 9, '01111001001101
01': 28, '0111010010001110': 21, '0010000001010101': 10, '1010000101000101': 21, '00
10110101100011': 1, '0111100110110001': 4, '1000011100100100': 1, '0111100111000011'

1': 1, '0101111110010011': 4, '1111110011101100': 1, '1000111110101101': 1, '0010100011101101': 3, '1111101100000001': 2, '0111000110001100': 6, '1101001101110001': 4, '1010110000101001': 2, '0000011011010011': 26, '0100011011010101': 2, '0010000001110100': 6, '1111110000011010': 6, '1011110110100111': 2, '0100011011001110': 2, '1010010001000101': 20, '1011110011001011': 1, '1111100101101100': 5, '0010100101001000': 23, '0101101000010111': 1, '0000101101110111': 6, '1000111001100001': 26, '1000011011001010': 22, '1000101011001011': 4, '0000101011011001': 1, '1111100110100010': 19, '0110100101111101': 2, '1010000110100011': 8, '1000011111101011': 7, '0000111001111000': 21, '0001011100010011': 1, '0010000100010100': 6, '1000101101101000': 24, '0001101101111101': 2, '1000111011001011': 27, '0110000010100011': 1, '0011010100001011': 1, '1111010010110010': 26, '0111110001010011': 4, '0111100101000110': 2, '1010110001000111': 3, '1010100101010010': 4, '0011000010000110': 1, '1010110111111111': 7, '0001111010100010': 4, '0111010001010101': 7, '1101101101100011': 1, '0010000111111011': 25, '1010000111101011': 24, '0011110000100111': 1, '1110000111100110': 2, '1001111110100001': 1, '0100111001100001': 1, '0111100110110000': 11, '0010110101100010': 2, '1010000101000100': 38, '1011010110010110': 2, '1010100111110110': 29, '0110110100110001': 1, '1101101110010011': 28, '1101011010000111': 21, '1011000110100101': 2, '1000001100011110': 2, '1111110100101011': 2, '0010010101111000': 4, '0010100001000100': 7, '1101011001010011': 2, '1000111100000100': 1, '1010010111100111': 4, '0010000101111001': 24, '0111010010001011': 20, '0111100100110010': 4, '0111110000000101': 17, '1000111110010111': 1, '1111000110100010': 25, '1100101111101111': 1, '0000001001100000': 8, '1000001111100001': 4, '1010010000101101': 4, '1110110101010001': 2, '0111010100110100': 8, '0000101100110101': 10, '0101101001010101': 2, '1000010110100111': 11, '1111110001001001': 3, '1010000000110010': 1, '1111100101011000': 7, '0101011000111101': 17, '0101101110101011': 15, '0010110011111111': 22, '0101011000111111': 4, '1010000000110000': 2, '0010100011110110': 7, '0001011100011110': 1, '0010000100011011': 4, '0001011000011000': 4, '0011010100001101': 1, '1000111011001101': 1, '1111010010110100': 2, '0111110001010101': 11, '0111100101000000': 1, '1110110000011100': 1, '1000001111000110': 22, '0000101111110001': 3, '0101011110101101': 1, '0010010001111101': 15, '1111010010000101': 4, '0010110011101101': 8, '0101101111010111': 3, '0111100100000110': 2, '1000101110010011': 4, '1001001100100100': 3, '1001001110001100': 1, '0010110001010001': 24, '1101111011010110': 6, '1010111111101110': 1, '1010000011110010': 3, '0100001001000001': 2, '1100101101111010': 1, '1111100010011010': 23, '0010111111010011': 1, '1000111001111000': 21, '0000101101100010': 9, '0000101011100000': 2, '0010110111111101': 3, '1000101101111100': 26, '0111100100101111': 2, '1010010000100011': 1, '1110100100011100': 1, '0111010100111100': 9, '0000001111101000': 11, '1000001111101111': 23, '1010000110000110': 13, '1001001110100111': 2, '0000111101110001': 8, '1000111111101001': 1, '0000011111000010': 4, '0010010001110001': 19, '0000101111111101': 6, '0101011110100001': 2, '0000011000001111': 2, '0111000000000101': 10, '1000010111011011': 5, '0001011000001001': 2, '1111110010011111': 17, '0110110101001000': 1, '0111010000010100': 23, '1000001110101111': 9, '1001111010110011': 1, '1101101110001010': 11, '1100011111011010': 1, '0101101011011110': 1, '0000101110111110': 4, '1111111001101111': 1, '0010100101000000': 24, '0010000101010001': 19, '0011110000000011': 1, '0101111011111010': 6, '0111000100110111': 8, '1000001011110110': 5, '1000101010001100': 1, '0010100110101011': 16, '0101111000000000': 29, '0111010000111000': 28, '1010100111000011': 20, '0010100101110101': 15, '0000101011001010': 2, '1000001011100001': 3, '0000101011010111': 2, '0000011111111110': 5, '0101101100101001': 16, '0011000010000111': 1, '1010110001000110': 11, '1010100101010011': 3, '1101011100110000': 8, '1010100101110100': 21, '1001111100010100': 1, '0101011110000110': 11, '0101011001001100': 3, '1111010100111000': 3, '1100001111110111': 2, '1000001110010010': 2, '1010001111011111': 2, '0110000101001001': 1, '0010000101101100': 16, '1000101111010111': 19, '0011100010110010': 1, '0010010101000101': 7, '0011100100011001': 5, '1101111000101001': 24, '0101011010000111': 25, '0000101100010000': 6, '0111000100111001': 23, '1010110001011100': 18, '1000011001001110': 4, '1000011111001001': 2, '1101011000110100': 34, '1000101111010100': 5, '1011100110100000': 1, '1101001100110110': 7, '0011110000001111': 1, '0010000101011101': 19, '1101

101001001001': 2, '1000010001011111': 1, '0100111101001100': 1, '0101011110011111': 6, '0000111101001110': 1, '0111110011111001': 3, '1011010110001000': 1, '1011110011011011': 1, '0111000111010011': 6, '1010100101000001': 21, '1101111111010111': 5, '1000011100001111': 1, '1010100010101010': 1, '1111100011001010': 1, '11011010000011000': 6, '0000001011000011': 10, '0101111010111111': 37, '0010100110001101': 4, '1111010100000001': 5, '1101101100001101': 16, '0000111101100000': 8, '0010000111010101': 2, '0010010011110110': 15, '1010110011111000': 10, '0101011100000110': 1, '0101101110111110': 21, '1010000000000101': 2, '0000101011100010': 8, '0010110111111111': 5, '0111100100101101': 33, '1000101101111010': 2, '0000101101100000': 28, '0101101000000000': 7, '0101101110010111': 29, '1101111000011100': 28, '0010000000011110': 1, '0111100101110001': 6, '0111100100111101': 23, '0111110000001100': 21, '0010110000001000': 6, '1111000000100101': 5, '0000001111111001': 5, '1010000011111100': 1, '1000101100110001': 6, '1001001110000010': 2, '0011000110011110': 1, '0101110000100100': 1, '1101001111011001': 3, '1111000100111101': 28, '1100101101110000': 2, '0010010110101100': 2, '1101001111111000': 1, '0101011011110110': 12, '1111100100111100': 27, '0000001101111110': 7, '1000101110100000': 3, '0011100010100111': 1, '0101001100001010': 6, '0010010111011111': 4, '1001001100111100': 1, '0111100100011110': 8, '0111110000101111': 5, '0010110000100001': 10, '0101001110010100': 5, '1111110011001100': 2, '0000010010000101': 1, '1000011101001000': 13, '0010110101110000': 1, '0111110011100110': 6, '1111000000011011': 1, '0111100000101101': 4, '0111010010011010': 35, '1001011010111001': 2, '1010010001111000': 25, '0000111111101010': 13, '1101011010110010': 24, '1111100010001101': 3, '0111000110011010': 21, '1000111110101100': 2, '1111110011101101': 2, '1010100011001000': 3, '1000011100100011': 1, '0101111110010100': 1, '0100101101110111': 1, '0101001001111000': 1, '0101111110101011': 3, '0010010000110110': 1', 21, '1111110110000110': 5, '1101011111101010': 1, '1111010110100101': 4, '1010100000100001': 1, '1111110010101111': 28, '1010000011001110': 7, '1111100111101010': 6, '0111010111000000': 1, '1010110011001101': 4, '1111110100111011': 1, '0000001111101010': 24, '0010000010001010': 2, '1010110110100000': 1, '0111110110010110': 10, '1101101011101110': 1, '1100111101100010': 1, '1000001110110110': 6, '1110100010100000': 1', 1, '0111010101100001': 3, '0111100101010100': 9, '0111110001100111': 3, '1000101001110011': 1, '1110110100100110': 1, '1010010001111010': 3, '1111110011101110': 4, '1010100011001001': 3, '1000111110101011': 4, '0101111110010101': 4, '1110100110000111': 1, '1101101000110001': 5, '0011110101110001': 1, '1010110101011001': 4, '1101011000000011': 5, '1000101111001000': 8, '0111010000111100': 24, '1010100001100010': 1, '1000001101010000': 27, '0000101001100101': 5, '1111010000010011': 6, '0111110011010000': 2, '0101111011001110': 4, '0111010000110001': 21, '1010101100111110': 1, '1101011110001111': 6, '0010010110000010': 2, '1000111101110110': 1, '1110010000100000': 1, '1010010111010111': 5, '1000101001100101': 9, '0111110001110001': 7, '0011110000101011': 1, '1110000111101100': 1, '0100111111001110': 1, '1010000111100111': 30, '1111110000110101': 23, '0010110011001010': 27, '0101001101111000': 7, '1000101101111111': 7, '0010110111111010': 4, '0111100100101100': 17, '0101101000000111': 1, '0000101101100111': 7, '0011010010011011': 5, '1111110010001001': 7, '1000101010001111': 3, '0111110000011011': 11, '1000001011110011': 5, '0101111000000101': 29, '0100001101000100': 2, '0111000110100100': 5, '0101111110101010': 2, '1111110110000101': 4, '0000101111110101': 12, '0111100100110111': 4, '0111110000000000': 22, '0010110011110100': 8, '0000011101000001': 3, '1000111111011011': 5, '0001111101010110': 1, '0111010001110100': 12, '1011010010000110': 2, '1111000001110111': 1, '1010011001111000': 1, '0011010110000100': 1, '1101001110111110': 24, '1111000111011010': 3, '1111110110101011': 3, '0111110010010010': 19, '0111010101010100': 2, '1110100101110100': 1, '1111010011110011': 3, '0101111000011101': 29, '0111110111000001': 1, '0010110001110001': 18, '1101111011110010': 4, '1111000100010101': 26, '0001001000100110': 1, '1101101111111010': 5, '0111000011100010': 1, '0111010010101011': 17, '0111111000100100': 1, '0001111100011000': 1, '1010100111000001': 8, '1000101111001010': 25, '1111110010000111': 24, '1101011011110011': 2, '1010010011001001': 3, '0111110000110101': 19, '0111100101100000': 1, '0010110110110010': 1, '0110110011001111': 1, '0000001000010110': 1, '1000001001110010': 1, '0010100100001111': 2, '1111000110110100': 10, '01110

00101100011': 1, '1101111001110101': 6, '1010110010001110': 9, '0100001111000011':
1, '0010110010101101': 3, '0111100010111110': 5, '0000001111100011': 26, '0010000010
000011': 1, '1010010000101000': 5, '0000101011000111': 6, '0010100101111100': 18, '1
101011101101101': 1, '0111100100011000': 21, '1100011001100001': 4, '110101110011100
0': 5, '0100111011101000': 1, '0000011111001011': 6, '0010010001111010': 5, '0000101
111110100': 1, '0101011110101010': 5, '1000011010010101': 1, '0000111010000011': 5,
'1100001100001011': 1, '0000101101001001': 29, '0101101000101001': 8, '0111000110100
110': 17, '1101011000111001': 31, '1101111010010110': 30, '1111000101011110': 1, '01
10010001111011': 1, '1000011010000011': 5, '0000101111100010': 18, '110011101001011
0': 1, '1010110110000010': 2, '0000101001111000': 6, '1100111001011001': 2, '0000011
010101010': 7, '1101111010000111': 21, '1101111010011101': 3, '1110000100101111': 1,
'1100101000110101': 1, '1101000110110111': 2, '0010110000010010': 1, '01110100100101
10': 28, '1110110001110001': 2, '1101011011000101': 1, '1110100011100110': 1, '11000
11000000101': 1, '1111110000111111': 2, '0010110011000010': 31, '0111010111100100':
2, '1101011100111001': 6, '1111010110111111': 8, '0000001100110111': 3, '01100001110
01110': 3, '1101001100010111': 5, '0010100100010101': 8, '1010000101101001': 23, '10
11100110111111': 4, '1010100100101100': 8, '1010010000100101': 7, '101000010101000
1': 19, '0010010011000111': 24, '1010001111011011': 1, '1000001110010110': 5, '11000
01111111111': 2, '0101101101010000': 6, '1010110011110101': 6, '1010000000001000':
2, '1010100000001100': 2, '1000011010101010': 13, '1000111001000001': 20, '001001000
1010101': 20, '0000101011111001': 1, '0101011111000101': 1, '1000101001001001': 3,
'0010100111101000': 4, '1111110010100110': 23, '1010100000101010': 1, '1110100111011
111': 3, '0111010111111111': 4, '0111100111101100': 2, '0010110011111101': 11, '0111
000010011001': 5, '0000011010011000': 1, '1101011010001000': 8, '1111010001001101':
2, '1111100010011100': 3, '0000111010011110': 2, '0010011111001010': 1, '01110000101
00111': 5, '0001011010100011': 2, '1111100011110001': 1, '0111010100000101': 6, '111
0100100100101': 1, '0100111011111011': 1, '1000001111010110': 16, '100000110100000
1': 20, '1100101101001110': 1, '0000101001010010': 2, '0111010100000001': 6, '111110
0011110101': 1, '1110110101000010': 1, '0100111011111111': 1, '1101101101111111': 1,
'1000001111010010': 27, '1111100010001010': 9, '1101011010110111': 21, '011111011001
1000': 3, '1000111000010000': 9, '1010100000110101': 2, '0000111011000001': 6, '1000
011011110111': 29, '0111000010011010': 3, '0111101110001101': 1, '1110110000001100':
1, '1101111110111111': 3, '1010110111011110': 4, '0000101110011110': 1, '10101001011
11001': 17, '0000011101110101': 9, '0000111001110011': 6, '1110110011011010': 2, '10
00011101100100': 11, '1101111000111110': 4, '1101001000111111': 2, '100011110100110
0': 5, '1101101100010000': 29, '0000001001011111': 1, '1010100110000011': 9, '011011
0011001011': 2, '1101100100011000': 1, '0010110110110110': 1, '0111110000110001': 2
8, '0010100110100100': 2, '0111110000010001': 21, '1010100111010010': 29, '101001011
1011011': 5, '1000111101111100': 6, '0010100000111100': 1, '0110100110000111': 1, '1
101011110000011': 7, '0111001110010100': 1, '1000011100010101': 1, '0000111000010000
0': 2, '0010010101101101': 5, '1111010000101001': 25, '0111110011101000': 1, '101001
0111111010': 6, '0010010011011110': 27, '0101101100010101': 35, '1010000000101011':
1, '0101011100101110': 3, '0110110001011100': 30, '0100001111111100': 1, '1010110001
011001': 20, '1101001100000001': 20, '0111010010110010': 11, '1000101111100000': 6,
'1101111001101011': 1, '0000111000000101': 3, '1000011000010011': 2, '01110110001000
00': 1, '0101011100111101': 7, '1101001111110100': 1, '1000001011001011': 9, '011100
0110111100': 10, '0101111000111101': 24, '1000101110001101': 1, '1101111011000010':
5, '1101011000010101': 24, '0101001111110101': 1, '1110100111101011': 4, '0010000011
011001': 1, '1000101011111101': 1, '0101100010001000': 1, '1000001011100101': 4, '00
00010101101011010011': 5, '0110010001001011': 1, '1010000110101001': 2, '111110011010100
0': 1, '1111000000010001': 6, '0010110101111100': 4, '0111100111001110': 4, '1111010
000011101': 29, '1101111100111011': 4, '0111100100100011': 1, '1000101101110110': 3,
'0000101011101110': 5, '1111110100011011': 2, '0101011000011001': 21, '1111010010110
111': 26, '0111100101000011': 2, '1000001111000101': 10, '0011110000111000': 4, '000
0011001101110': 6, '0011010000101000': 3, '1010110100011100': 1, '0100111101111000':
1, '0001111110001011': 1, '1111110011100001': 2, '1000111110100110': 5, '01011111100

11010': 11, '0101001101010111': 2, '1010010101011001': 8, '1111110001010010': 3, '1110000111001110': 3, '0111010000101001': 19, '1010100111010100': 8, '1000001101001000': 32, '1101111100001010': 1, '0110100001110000': 1, '1111000100100010': 7, '1000011011011111': 27, '1001101100000101': 3, '1000111000010110': 2, '1101111101011110': 1, '1111110000000001': 18, '1000011000001011': 2, '1100111001111000': 4, '1010010101001100': 6, '1101111101110110': 2, '1111010001011000': 3, '0010100000000100': 2, '0100101011010111': 2, '0000001001010001': 6, '0111010001101010': 2, '1000111101000100': 5, '0000111001111101': 24, '0000011101111011': 1, '1000011101101100': 5, '1110110011010110': 4, '1101001000110001': 4, '1101111000110010': 10, '1101111101110010': 2, '1000011000101001': 6, '1101001110011010': 22, '1101011110000010': 6, '0010010110001111': 4, '0110100110000110': 1, '1110010000101101': 1, '1010010111011100': 2, '1000000101111010': 1, '1000001011011110': 7, '0001101101100000': 2, '0111000000000010': 2, '1111110010011010': 32, '1111100001111000': 1, '0111000111001111': 7, '0010110001111001': 16, '1111000011111010': 2, '0101101101000000': 2, '0001101000001100': 1, '0111100000001000': 5, '0000011101101100': 7, '0000111001101010': 12, '0001001000111000': 1, '0000111001001001': 21, '1111000000001101': 5, '1001111000101100': 1, '0101011001011110': 3, '0111000001000010': 1, '1101111110000101': 2, '1000011000011000': 3, '1010010011011101': 8, '0000101000000100': 1, '1000001101110001': 20, '0010110001110100': 20, '1101111011110111': 6, '0111100000000101': 8, '0100111001111101': 2, '1101101111111101': 2, '1111000100010000': 31, '0010010001100011': 6, '1111110110001010': 4, '0101111110100011': 7, '0010010001100101': 41, '0101111010000110': 18, '0011100110011111': 4, '0111100010110010': 5, '0010110010100011': 7, '0010110010101011': 17, '1100101011001110': 1, '0111100111111010': 5, '0010110100101100': 1, '0110010101111001': 2, '1011110000011001': 4, '1111010111100011': 1, '1000111000010101': 10, '1001101100000110': 2, '1000011011011110': 28, '0000000001001101': 1, '0010000011000011': 6, '0111111001011110': 1, '0000101001001001': 6, '0111000111001100': 2, '1010100110111111': 1, '1010101001011101': 1, '0100111011100111': 1, '0000111011010111': 10, '0011100101110111': 2, '0101001111111000': 2, '0000011110100011': 1, '0010010001010100': 24, '1000111001000000': 29, '1111010001001110': 1, '1111100010011011': 9, '1101011010001001': 4, '1010000111001101': 8, '1111100010011101': 1, '1111010001001100': 8, '1101011000111000': 32, '1010110011011111': 16, '1010100110100010': 8, '1010000011101110': 9, '1011100001010000': 1, '0010110001001101': 31, '1100111001101000': 2, '1011000110101111': 3, '1101011010001101': 7, '1111010001001000': 2, '1001101011001110': 1, '1000001100010110': 3, '0010100001111010': 3, '1111010110100100': 2, '0101011010001011': 20, '1011110000101000': 1, '0000001110101010': 11, '0101001000101101': 7, '1111110001000110': 1, '1101001111001010': 4, '0101001111100101': 1, '0010010101110100': 4, '1100111011011011': 3, '0010100001001000': 11, '1100111111010100': 1, '1101011110010011': 9, '1111100111001110': 12, '1000001100010011': 3, '0010100001111101': 7, '1000111100111101': 1, '1101011010001010': 19, '0101111000111111': 4, '1101011110101110': 12, '0100001100011010': 1, '1101111100001011': 6, '0110000000101110': 1, '1111000100100001': 26, '1001001100000010': 1, '0001011001001100': 1, '0001101100101110': 1, '0000111111110000': 2, '0111110110111010': 9, '0010000101000101': 27, '1101011000000100': 23, '0000000010100010': 1, '0010000000001100': 3, '1110100111000110': 4, '0111010110100110': 6, '0000011001110101': 20, '1010000110001001': 2, '1001111000111101': 4, '0101011001001111': 2, '1010000010000000': 1, '0101011110000111': 6, '1001111100010001': 2, '1010110001001011': 6, '1010110111110011': 6, '1010010011100010': 27, '0011000100110010': 3, '0101101110000110': 23, '1110100000111100': 1, '1011010000010100': 3, '1000101010101010': 3, '0000101011110110': 8, '0000001110110100': 3, '1101001001011111': 1, '0010100111000001': 5, '1101111001011010': 2, '0100101101111000': 2, '1111010000001111': 9, '0101101101110000': 6, '0111100000111000': 8, '0101001100100010': 7, '1010010101100100': 10, '1111000110010000': 6, '1010010110000110': 3, '1000001001101000': 8, '1101011011010010': 8, '0111100101101011': 1, '1000000111100111': 1, '1101111010110010': 32, '0010110000110001': 7, '0000101100100001': 4, '1000111111111010': 11, '1101011000101001': 16, '0011000100010100': 2, '0010000110010011': 2, '0100111111100010': 1, '1101111010110111': 16, '0010110000110100': 9, '0010010000101101': 4, '1001101110010110': 2, '0000011111011010': 9, '01100100100

01100': 1, '1101011100111100': 8, '1010110001001110': 4, '0111000100101000': 23, '10
10110011011110': 31, '0000001011000111': 4, '0101111010111011': 27, '010001100111101
1': 2, '0000011000111101': 1, '0110000101100000': 2, '0000101110101111': 13, '111100
0100110001': 23, '1011110010011010': 3, '0101001110101000': 8, '1000101110010000':
2, '0111110000011000': 31, '0111100100000101': 33, '1001001100100111': 1, '000001110
1001011': 2, '1000111111010001': 3, '1000011101111010': 2, '0000001011100100': 3, '1
111010100001000': 8, '1011010010001110': 2, '0000111101101001': 8, '111101001111011
1': 4, '0111110010010110': 27, '1110100101110000': 3, '1000001101011001': 20, '00000
10011011111': 1, '1010100011001000': 10, '1101011011110010': 6, '0111000101110000':
5, '0101011000101111': 8, '1101101110010101': 6, '0010000111001111': 28, '1000011001
111001': 17, '0000111000100011': 1, '0111001110010111': 1, '1010010111111011': 9, '1
110110111001000': 2, '0010100001011100': 3, '1000001100111000': 3, '010100111011110
1': 6, '0000101101101010': 10, '1100101100110001': 2, '0101101000001010': 2, '100010
1101110000': 17, '0111100100100101': 19, '0010110111110111': 9, '1010000111010010':
20, '0010010000101000': 7, '0111110100110100': 3, '1000111011111010': 25, '000011101
1010111': 26, '0010110011000100': 6, '1101100111101111': 1, '1010110001100010': 7,
'1101001100011001': 17, '1010100101010100': 23, '1010110001000001': 30, '01111100001
10111': 10, '1101011011011011': 4, '0000100101010000': 2, '1111100110110100': 4, '00
10000100001111': 1, '1000111001110001': 28, '0000001110011011': 4, '001000001101101
1': 6, '1110100111101001': 1, '1111000001111100': 2, '1101001110110001': 9, '1111000
010100101': 2, '1101011010100001': 4, '1010110011000010': 27, '1100111011101000': 1,
'1111110100110100': 4, '1111110011010110': 7, '1010100001011100': 3, '10110000101010
11': 1, '0111010100101001': 3, '1101111000000000': 29, '0111000101010110': 2, '11110
10010101101': 4, '1000101001011100': 6, '1101001000100101': 3, '0010110111001111':
5, '0010010001101110': 4, '1111110110000111': 10, '1000001111011010': 19, '110110110
1110101': 5, '0000011101010000': 3, '0000111010010010': 6, '1010100111000111': 21,
'0010010111011100': 4, '0101001100001101': 28, '0110000111000110': 2, '1001101101010
010': 1, '1101001100011101': 28, '0100011010101001': 1, '0111010110011100': 2, '0010
000101011000': 20, '1101111000010000': 22, '0101101110011101': 5, '100111101000011
1': 2, '0101011100001001': 5, '1010110011110111': 25, '0011000110110110': 3, '110110
1010000001': 2, '1111010011111000': 3, '0111110010011001': 9, '0001011110011100': 1,
'0111110110101101': 1, '0101011000000111': 16, '0001111100000000': 1, '0111010000100
110': 3, '0000111110101011': 3, '1000001111111101': 6, '1110110101101101': 2, '01111
00110011111': 21, '1101111101010100': 4, '1000011000000011': 1, '0000111000011001':
2, '1010110001100011': 5, '1010100100110110': 4, '0010010100100100': 3, '01011110100
001110': 19, '0001101110000110': 3, '1101001110001000': 5, '1010010001001101': 27, '1
011110111000111': 1, '1000001011100011': 8, '1101001110101111': 21, '011110011011100
0': 9, '1010000001000101': 8, '0000001111001111': 19, '0010010010110110': 3, '001101
1010000010': 1, '0010000100011001': 4, '0001011000011100': 2, '1000101101100101': 2
4, '0010110010001000': 4, '1000111111001111': 4, '0010010011011100': 4, '01011011000
10011': 6, '0010110110101010': 1, '0111100100011100': 34, '1010000001001110': 2, '11
01001110100110': 25, '0010110111100111': 6, '0010010010111111': 2, '000000111100011
0': 22, '0110010000111011': 1, '0010010110000110': 1, '0101001111011001': 2, '110101
1110001011': 9, '1000111101110010': 1, '1010010111010011': 6, '0101001110111010': 3
0, '0010010101101011': 1, '0010100001011111': 2, '1011000100101100': 3, '11100100111
00010': 2, '1111110011110001': 2, '1010110110001110': 5, '0000101111101110': 24, '01
01101100000111': 8, '1110100001101001': 1, '0010000101111011': 7, '011101001000100
1': 6, '1110110001000100': 5, '0010110000000101': 3, '1101111011000000': 1, '1000101
110001111': 8, '1111000000101000': 9, '1101001101101011': 3, '0000011011101101': 8,
'1010100001001000': 6, '0000101101010001': 18, '0101101000110001': 5, '0011010000101
101': 1, '1011000100011100': 1, '0000011001101001': 27, '0101111101011010': 1, '0011
010100100001': 1, '1101011100011000': 7, '1010100101110111': 7, '0011000101100010':
1, '1000001010101111': 4, '1001001110011000': 2, '0101001000100000': 4, '11110101011
10000': 1, '1010000110000100': 2, '0010000001101100': 6, '0111100110000111': 24, '00
00101110101110': 12, '1010110110011111': 2, '0000101111011111': 29, '010110101011111
1': 9, '1100101111110010': 3, '0010000111110011': 19, '0111010001011101': 10, '11011

11010001101': 5, '0000011010100010': 4, '1010110001110100': 23, '0111100000101000': 9, '0101101101100000': 2, '0010110000011001': 4, '0000101000100001': 1, '0001001110100111': 2, '1000111010001001': 2, '0101101100000100': 27, '1000111000010100': 5, '1001101100000111': 2, '1000011011011101': 4, '1011110110000000': 1, '0101111101001100': 1, '0111010110001001': 1, '0101111011100100': 1, '1001101100011100': 6, '0101101010011101': 2, '1000011000000110': 1, '1111110000001110': 6, '1010100010101000': 1, '1101111101010001': 2, '0101001101101011': 1, '1111000000010000': 11, '0010110101111011': 2, '0111100111001101': 1, '1111011010110011': 1, '1101011000000001': 29, '1000111101101001': 5, '1101001110110010': 34, '1100111101111000': 1, '1010100000101100': 1, '1111110010100100': 8, '1101111000100101': 24, '0010100111011110': 28, '1111100110000011': 19, '1011110010100010': 2, '0101101110101111': 28, '1100111001010101': 2, '1101001100101100': 27, '1111010001110101': 5, '1111100001000000': 1, '0000001100001100': 9, '1001001110000001': 1, '0010110001011100': 20, '0101001000111001': 9, '0011000110011111': 2, '1111101010010101': 1, '0100111001110110': 1, '0111100010101000': 4, '1010000100110101': 4, '1111000100011011': 5, '1101101111110110': 6, '1101111011111110': 4, '0010110001111111': 4, '1011100100110111': 1, '0011010011001010': 2, '1000001111010000': 7, '1101101101111101': 5, '0100111011111101': 2, '0111010100000011': 1, '1111100011110111': 1, '0111000100011101': 20, '0101101011100010': 3, '0000101111000010': 22, '0101011110111110': 9, '0000011001010100': 14, '0010010001001110': 7, '0101001110001100': 6, '0010110001000010': 8, '0111100000010001': 9, '1010000011100011': 4, '0010100111001110': 19, '1101111001010101': 7, '0101001001111100': 1, '1101001001010010': 1, '0000011100010101': 2, '0100011001111000': 3, '0101111100001111': 2, '1000111011010110': 23, '0111010000000010': 5, '1010100100000000': 6, '1010110000110111': 1, '0000011011101001': 4, '1010100001001110': 1, '1011000100011001': 1, '0000011001101100': 34, '1000001110001100': 1, '0001111000010001': 2, '0111000111110110': 5, '1010100111100001': 11, '0111010010110000': 6, '1000101111100010': 32, '1101001000001110': 1, '1111010000010100': 21, '0111110011010111': 4, '1011110101001100': 1, '0101111011001011': 11, '0000011010010110': 4, '0111000010010111': 4, '1100111000110100': 1, '1001011000101100': 3, '0101101111100110': 2, '1011110011000110': 1, '0110000110000111': 20, '0111011000001100': 2, '1101101111010110': 5, '1111100010001000': 29, '1011100100101010': 1, '1010000100010001': 5, '1111110010011110': 9, '1111010001001011': 1, '0110110001110000': 2, '1100111001101011': 2, '1000101100010001': 4, '0000111001101011': 7, '0010001111011111': 1, '1101001010101000': 1, '1101101101101010': 1, '0010000111110000': 8, '1010110011000000': 7, '1010000100010000': 5, '1101101111010111': 7, '1111100100010001': 25, '0100111001010111': 1, '0101101011010011': 2, '0000101110110011': 3, '1001101110110110': 4, '0010100101001111': 10, '0000011001000001': 22, '0110010000001100': 2, '1100011111010111': 1, '1101101110000111': 18, '1001111010111110': 2, '1111100010101011': 5, '0101011000100110': 8, '1100101111101001': 1, '1101011000011011': 5, '1101001010011100': 3, '0101011001011000': 7, '1101001000011001': 8, '1101111000010110': 15, '0101101110011011': 33, '0101101001010001': 2, '1100101101101010': 2, '0000101100110001': 5, '1010000111110000': 5, '0101001010001001': 3, '0011110011001111': 1, '0101111010010100': 3, '0101111110001000': 3, '0101011011010100': 1, '1011010100100000': 1, '0101101111001011': 5, '0111101100110000': 2, '0111000110000100': 5, '1101001111001111': 5, '0101001000101100': 5, '1111110010000001': 4, '0000001110101111': 13, '0010100111011001': 7, '1000001111001101': 13, '1110110000010001': 1, '0111100101001011': 1, '1111010010111111': 25, '1011100100101110': 1, '1111100100010100': 22, '1101101111010010': 7, '1010000100010101': 7, '1000101101001100': 18, '1001001110011111': 4, '0000101100110000': 5, '0101101001010000': 1, '0111000100101100': 20, '0010110000001111': 2, '1000101110000101': 1, '0010000101110001': 23, '1001101000000101': 2, '1101011011100110': 4, '0101001101110001': 5, '0000111011101101': 5, '1010000110001010': 11, '1010100110000000': 3, '1101011100000001': 8, '1000001001101011': 1, '0101101000111010': 1, '0000101101011010': 4, '0111110100001100': 6, '1010100011111011': 32, '0100111000110100': 1, '1111100000011010': 2, '1010000101110111': 4, '0010110100010001': 1, '1101101110110100': 4, '0111100110100011': 21, '1000101101111011': 4, '0010110111111110': 6, '0000101011100001': 3, '1010000011000100': 3, '0000111011111010': 28, '0110010101110100': 1, '0010100101111101':

15, '0000111000110100': 10, '1000011001100010': 4, '1010100011000000': 2, '110011110 1000100': 1, '1110110100001000': 1, '0111110010001001': 7, '1001011010111111': 1, '1 110110100100000': 1, '1000101001110101': 3, '1111010011000110': 6, '011110010101001 0': 3, '0111110001100001': 1, '1001001010000011': 1, '0111000000001101': 8, '1000001 011010011': 3, '1111110010010111': 23, '0110100101011110': 1, '0101001111000100': 3, '0011100100001001': 4, '0010010101010101': 4, '0000001101001000': 31, '1101001101101 000': 3, '1010110000110000': 2, '0101111011111110': 6, '0011110000000111': 1, '00100 00101010101': 16, '1010010011111101': 4, '0101101111100101': 1, '0111010000010000': 20, '1000001110101011': 7, '0101011001000111': 2, '1001111000110101': 2, '0000001111 000011': 33, '1101001110100011': 19, '1101000100001011': 1, '0101101010110011': 6, '0000101111010011': 15, '1111000100011001': 27, '0111100010101100': 1, '001011001100 1100': 11, '1101011001010000': 10, '1000100101001101': 2, '1110010000011001': 1, '10 10010111100100': 3, '1010110010111100': 1, '1111110100101010': 1, '110111100011011 0': 2, '1101001000110101': 9, '1101101100011100': 22, '0000001001010101': 3, '100011 1101000000': 6, '0001001100011100': 2, '1100001111101110': 4, '0001011000000100': 3, '0111000000001000': 6, '0111000100000001': 24, '0010110011110110': 24, '111101010100 1000': 1, '0011100101010100': 2, '0010000011110011': 5, '0000111111001111': 7, '1101 001110010011': 23, '0000011011110101': 6, '1000110101001000': 1, '1101111000011111': 11, '0101101110010010': 24, '1101011101010100': 2, '0010100101101001': 23, '00000111 00101100': 2, '1100001101100000': 2, '1011000110010000': 1, '0110010100011101': 1, '0101111110000101': 2, '0101111010011001': 12, '1000011101000000': 11, '000011100101 0011': 6, '1000111101101100': 7, '0010110010001001': 2, '0101101100010010': 9, '0010 010011011011': 25, '0111110011000001': 1, '1111010000000000': 23, '101110011011001 1': 2, '1010110000010101': 10, '0111100110000011': 21, '1100101011010100': 1, '01010 11101110101': 3, '0010110011010001': 11, '0110100100001100': 1, '1010000001010000': 2, '0111100010100010': 8, '1010000101011011': 7, '0111010010011001': 7, '00100100110 01101': 6, '1111000100110010': 10, '1101111011010001': 4, '0010110001010110': 6, '00 11000110010011': 1, '1100101001111001': 1, '1101011000000010': 9, '110111100000100 1': 23, '1101000100100011': 1, '1001101100011010': 1, '0101101010011111': 9, '010111 1011100110': 4, '1010110110111111': 1, '1101101001010001': 2, '0110010100001101': 1, '1010110100111001': 2, '0101011010000110': 22, '1111110011100011': 3, '0101001111111 101': 2, '0000001011110111': 10, '1010000110111010': 1, '0101111110000001': 2, '0000 100111011011': 1, '0010100101101101': 26, '1001011000000000': 1, '0000001001110100': 6, '1101001000010100': 6, '1111001110111111': 1, '0111000101000001': 2, '10110000100 01110': 1, '0010000101001000': 23, '0011000100100001': 2, '0011110000010110': 1, '01 01111001011110': 3, '1100111101100101': 1, '1101101011101011': 2, '011110010101001 1': 2, '1111010011000111': 5, '0111110001100000': 3, '1000101001110100': 5, '1010010 001111111': 4, '1000001001000101': 6, '0000001000100001': 1, '0010100100111010': 1, '1111000111100011': 7, '0111000100110110': 6, '1011100111111011': 2, '11010011000011 01': 21, '0100001111110110': 1, '0000111100011000': 2, '0101011100100101': 5, '01001 01111101011': 1, '0101101100011110': 13, '0010010011010101': 5, '1000111111000000': 1, '1111010011001010': 6, '1000101001111011': 1, '0100000101011101': 1, '10100100011 10000': 20, '0010101101101101': 1, '0101111001010011': 2, '1101001100100111': 3, '10 00001000101111': 1, '1111100100000001': 20, '1101101111100011': 6, '001011010100010 0': 4, '1100011110010011': 1, '1111100001001101': 1, '0000001100000111': 2, '0100111 001000011': 1, '0000101011011110': 3, '1000001011101100': 2, '1010100111101110': 25, '1111010100101001': 2, '0111000111111011': 4, '1000001110000111': 12, '0001111000011 110': 1, '0000001010000110': 2, '1111100010000000': 1, '1101011010111111': 24, '0111 000110010101': 4, '0010110001001001': 18, '0100001001011001': 1, '1000011001111011': 3, '1100011011100101': 1, '1110110010100110': 1, '1111010000101010': 6, '11010110011 00101': 2, '0111110111101110': 1, '0101111000111000': 27, '0111100000110010': 2, '00 10110001100101': 25, '1101111010100000': 5, '1010110110110001': 1, '1001101100010110': 1, '0101111011101010': 8, '0101101010010001': 2, '0101011010001010': 22, '011110 1101010001': 1, '0111100000100010': 1, '0111010010010111': 30, '1110110001110000': 5, '0101001010000110': 1, '1101101010110000': 2, '0110100001101100': 1, '01110101101 00111': 2, '1110100111000111': 3, '0100101111110000': 1, '0010000000001011': 1, '011

0100101000011': 1, '1010000111011111': 26, '1111100100101100': 21, '011100011010101
1': 21, '1000001011111110': 6, '0111110000010100': 28, '0111100100001001': 17, '0101
111000001100': 26, '0000011001100101': 28, '1010010000111001': 2, '001101000001000
1': 5, '1100000110001111': 1, '1010000111011001': 5, '0101001111101011': 10, '111111
0100101001': 8, '0010010101111100': 5, '0111110010010100': 8, '1110100101110010': 1,
'1111010011110101': 1, '1000111001001001': 27, '0000101100010011': 2, '0111110000000
100': 30, '0111100100110011': 6, '0010000101111000': 18, '0111010010001100': 3, '111
0100001101100': 1, '0000111000000111': 1, '1000011000010001': 5, '1000001100010000':
10, '1101011010001011': 22, '1111100010011001': 2, '0000111101001010': 1, '100111110
0001101': 1, '0101011110011011': 6, '1000010001011011': 2, '1000101011100011': 10,
'1000001010011101': 1, '0000100111010110': 1, '0010100101100000': 22, '1001011000001
101': 4, '0111100001011000': 3, '0101101100010000': 25, '0110100011001100': 3, '1000
111111101010': 4, '1011110100100000': 1, '1101011011111000': 1, '0010100010101010':
3, '1010010011000010': 26, '1001101000011001': 3, '0101011001000001': 2, '1011000100
101101': 1, '1001101101010101': 1, '1101001100011100': 27, '0101001000100101': 4, '1
000101101001000': 30, '1000001010101100': 1, '0110110001010101': 4, '101011011100111
0': 6, '0101101010001110': 3, '1111000010100111': 6, '1101011010100011': 14, '000001
1101011011': 2, '1000011110001100': 3, '0010110011000001': 5, '1111110000111110': 1
0, '1000111001111101': 18, '1100001111010010': 2, '0001001100000000': 4, '0000101101
011011': 8, '0101101000111011': 3, '1111010100100000': 2, '1111000110110010': 25, '0
101100100110100': 1, '1000001001110100': 5, '0000001000010000': 4, '000011101111010
0': 10, '1010110010001001': 1, '1010000101110110': 7, '0010110100010000': 1, '110110
1110110101': 9, '0111100110100010': 16, '1011000100111110': 1, '0100011000000101':
2, '0000011110000010': 1, '1100101000010000': 1, '1101111010111000': 2, '10110100011
11101': 1, '0111010010000101': 2, '1110100001100101': 1, '1110110001001000': 1, '011
1110000001011': 7, '0111100100111110': 4, '0010110000001001': 7, '1000011001100001':
28, '1010100011000011': 4, '0000111000110111': 2, '0010110011101001': 8, '1010010110
111111': 1, '1001111010010011': 2, '1110010001001110': 1, '1010100010001010': 3, '11
00001001000001': 2, '1011110110010011': 1, '1000111001101000': 30, '010000110101011
1': 1, '0011010111101000': 1, '1000001101001010': 6, '1100101101000101': 1, '0101111
001110111': 4, '1010100001011000': 21, '1010000100100101': 8, '0101001101100101': 2,
'1111110000000010': 6, '1101111101011111': 2, '1000011000001010': 1, '000011100100011
00': 29, '1010110101101011': 3, '1000011100110001': 2, '1101101010011011': 6, '01101
10011110111': 5, '0101111110010010': 9, '1000011100100101': 1, '1111110011101011':
3, '1000111110101110': 5, '0010100011101110': 8, '1010000111000011': 18, '1000001011
101010': 5, '0101011000110110': 6, '0010011011100001': 2, '0101101110100000': 4, '10
11000000000001': 1, '1011000100001000': 3, '1010100011110010': 9, '000000110111010
1': 17, '0101011100111000': 3, '0101011011111111': 2, '1111100100110011': 5, '001001
0011101000': 4, '1101001101010101': 8, '0010000110111011': 1, '1001111110001011': 2,
'0100001011110111': 1, '0000011101111001': 4, '1000011101101000': 7, '10000111111011
10': 8, '1000101101010010': 4, '0010000100100110': 1, '0101111010101111': 23, '01111
10011000110': 6, '1111010000000111': 5, '0000111000010100': 6, '1101111101011001':
1, '1010110001100101': 38, '1010100100110000': 4, '1000001101001011': 5, '0000101001
011010': 2, '1000101101100001': 28, '0111000000011100': 2, '1000001000000001': 2, '1
001011010010001': 2, '1000001100001000': 10, '1001011100101110': 1, '011100011110010
0': 2, '0111000111100101': 2, '0001001110101010': 2, '0110000111101011': 2, '1001101
110011011': 5, '0000011111010101': 3, '0010010000100000': 1, '0000111101101100': 6,
'1101101100000111': 3, '1000010001111101': 1, '0010000111011111': 33, '0000111010000
110': 8, '0000011101001000': 12, '1000011010010000': 1, '0101101101010001': 6, '0010
011000010000': 1, '0111110010101011': 23, '0111100011110010': 3, '1010000100101001':
4, '1010000001100000': 6, '0010110011100011': 22, '0111110010011111': 27, '100010100
0001011': 2, '0101001111100000': 1, '0010010101110001': 6, '1111001110011010': 1, '0
000000001100110': 1, '1111110011000100': 1, '0101001110011100': 8, '101010011010111
1': 7, '0001111001011111': 1, '1111010001111000': 3, '0000101001111001': 5, '0010000
011001101': 2, '1010100111001111': 21, '0110100100010110': 1, '1101011100010010': 7,
'0101111100100000': 10, '0110000101000100': 3, '1001111001111001': 2, '1010100111010

111': 24, '0111010111001100': 1, '1010100011000111': 29, '1001111010010010': 3, '111
0010001001101': 3, '0010100011011100': 5, '1010100111001011': 17, '101010000110100
0': 6, '1101011000101111': 7, '1000111101011100': 4, '0010100000011100': 3, '1111110
010101000': 9, '0000111010111100': 2, '1010101101111011': 1, '1100111101110100': 2,
'1000101001000111': 2, '0010100111100110': 24, '0010000001000101': 8, '1000111001110
100': 22, '1110010101000110': 1, '1111100110110001': 9, '0010000100001100': 8, '0000
101100011000': 7, '1000111001000010': 5, '0101101001111000': 2, '1000011010101011':
6, '0010010001010110': 5, '1010100001011110': 8, '1001011011011101': 1, '01011011111
10010': 10, '1011100110011100': 1, '0000110111011010': 1, '1111010101010111': 1, '01
00011101000100': 1, '1111000000111101': 11, '0000011110001111': 3, '000000110000010
1': 4, '0100111001000001': 4, '1111010001111100': 7, '0000101001111011': 2, '1111100
100000011': 6, '1000001000101101': 1, '0010110101000110': 1, '1101101111100001': 2,
'0101011010110111': 21, '0100101101010101': 1, '1010010101111100': 9, '0111100111101
011': 7, '1000101001001000': 6, '0010100111101001': 10, '1111110010100111': 22, '010
1001100111000': 28, '0010010111101001': 2, '1101001100001100': 24, '110100100100011
0': 1, '0111000100110001': 28, '0111000100101101': 19, '1100011001001001': 4, '10111
10100110001': 2, '1010110011001000': 10, '1000101111011100': 5, '0000101101001111':
6, '0101101000101111': 1, '0101101000001111': 1, '0000101101101111': 6, '00101101111
10000': 1, '1000101101110111': 4, '0111100100100010': 7, '0000101011101101': 1, '011
1010010001111': 17, '0111110000000001': 25, '1000101110001001': 2, '011110010011011
0': 5, '0001001100011000': 1, '1010110010101110': 13, '0000011101000101': 9, '100011
1111011111': 12, '0000001011101100': 2, '1101111000100110': 5, '0010100111011111': 2
1, '1100011101010000': 2, '1111000101101101': 6, '0111010010100111': 30, '1000101110
110101': 1, '1000101011000011': 10, '0111010110110001': 1, '1111100110101100': 6, '0
110100101110101': 2, '0110010001001001': 2, '1010000110101011': 12, '000111111101001
1': 1, '0010100101101100': 16, '1001011000000111': 1, '1101001000010011': 3, '110011
1111111111': 2, '1010111001010010': 1, '0101101110101101': 8, '1010000000110100': 3,
'0101011000111011': 2, '0010100100001000': 3, '1010000101110100': 17, '1101101110110
111': 26, '0111100110100000': 7, '0111000000011000': 6, '1011110100011100': 1, '1111
010001100110': 1, '1010010011011010': 30, '0000101000000001': 2, '1000001101110100':
18, '1000001111110011': 21, '0010111011011010': 1, '0111010000101010': 7, '011110011
0010001': 9, '1010110011101001': 7, '1110000011110011': 1, '0100011011000110': 2, '1
010010001001111': 3, '1111100000000100': 5, '0111000101110011': 2, '110111100110100
1': 3, '0001011001010100': 3, '0101011000101110': 11, '1101101110100111': 20, '00101
10100001000': 2, '1010000101100010': 8, '0000101101110000': 18, '1000111001100110':
3, '0101101000010000': 12, '0100001101011001': 2, '1000011011001111': 29, '000010111
1000111': 28, '0000011001010001': 20, '1000011000010110': 1, '0000111000000000': 8,
'1111010001001001': 5, '1101011010001110': 18, '1000001100010111': 2, '1111010001110
111': 2, '0100111001001110': 1, '0000001100001010': 1, '1000001000100000': 2, '00001
01001110110': 1, '1101101111101110': 3, '0010110101001011': 1, '0011110001111001':
1, '1010100110010111': 2, '0101111100101110': 1, '1000001110100111': 7, '01111100011
11000': 7, '1111010011011001': 4, '0111100000110000': 2, '0101101101111000': 10, '11
10110001100110': 3, '0010110001100111': 10, '1101111010100010': 18, '010101100011001
1': 11, '0101101110100101': 8, '0100111100001000': 1, '1101001010100011': 7, '100000
1111001110': 22, '1111110001001100': 4, '0101001000100001': 8, '0011010001100100':
1, '1001111010100001': 1, '0011000100111001': 2, '1000101011010101': 2, '01000111111
11001': 1, '0010100101010100': 21, '1011110000111101': 6, '1111100111111110': 8, '10
11110110011111': 2, '0101101101110001': 5, '0111100000111001': 3, '101011010100100
0': 7, '1111111000111001': 1, '0010110000100000': 3, '1001001100111011': 2, '0010110
110101111': 3, '0111100100011101': 17, '1001001111110110': 1, '1010000110010101': 2,
'1111100110010100': 5, '0000111101001000': 7, '0101011001000101': 2, '11110101011111
00': 1, '0101011001001000': 4, '0010010111010110': 7, '0101001100000001': 22, '00101
10011111011': 23, '1010000111111011': 31, '0000001101000100': 26, '0000001000011101
1': 1, '1010000101111000': 19, '1111000110111111': 29, '0010100100000100': 8, '01011
11101101000': 1, '1111000110001101': 5, '0110110011111111': 1, '1101101010010011':
4, '1110100101101001': 3, '0111010101001001': 1, '1111010000001010': 6, '00101100011

01000': 37, '0101011010101010': 26, '0011110010111110': 2, '1010110101010001': 7, '1001101111010100': 1, '1101101000111001': 8, '1101001101000001': 4, '0000011011000011': 17, '1101001101011100': 9, '0101001000011001': 4, '1011110110100110': 2, '0001101110001111': 2, '1010010001000100': 16, '0100011011001101': 1, '1101101000111011': 2, '0010000001100100': 8, '0111010010001010': 12, '0010000101000110': 5, '0111110110111011': 10, '0011110000011000': 2, '0000111111110011': 6, '1010000011000011': 10, '0111100110001001': 2, '0010110011110011': 26, '1100101101000001': 2, '1000001101001110': 9, '1010110011011101': 5, '1000111000110101': 3, '0000111101000100': 7, '0101011110010111': 6, '1111100110011000': 8, '1010110010101010': 7, '1101001000101010': 3, '0010110011000010': 5, '1111010010100000': 5, '1000101001010111': 2, '0010100111110100': 5, '1101111000001101': 22, '1111100010001001': 1, '1111000010111100': 3, '0101101100101110': 1, '1111110110100010': 3, '1110100101111101': 2, '1111010011111100': 1, '0111110010011011': 24, '0111010101011101': 2, '1101111011111010': 7, '0010110001111011': 6, '0101011000110000': 30, '0010100010010000': 1, '0101111111110110': 1, '1000101101111001': 15, '1000101001000010': 2, '0010100111100011': 17, '0000111001001000': 26, '1001101111101010': 1, '1111000000001110': 1, '1101111010101101': 2, '0010110001101010': 2, '0111110011001001': 5, '1111010000001000': 28, '0111100000111111': 2, '1010101101011000': 1, '0000111011011001': 3, '1111000010111000': 1, '1101011010110100': 7, '1111100010001011': 4, '1111110101101100': 2, '1010110011111010': 24, '0000000100001101': 1, '1010110100000110': 1, '0000011001110100': 15, '1111010010011111': 26, '0110100111000101': 1, '0010000111100111': 18, '1111010100010011': 2, '1010000101011000': 24, '0111100111000100': 1, '0010110101110010': 3, '1101011011101011': 4, '1010000001001100': 4, '1101001110100000': 5, '1011100110001101': 1, '1001011100011000': 1, '0000001101000010': 10, '0001001100100111': 1, '1010110011101011': 22, '0111110111011000': 1, '0111110100100100': 7, '1101001001010101': 4, '0101001001111101': 1, '0010100111001011': 28, '1101111001010010': 1, '0111100000100100': 5, '0111010010010001': 7, '0010110000010101': 4, '0010111011101110': 1, '0111010000111110': 1, '1010101100110001': 1, '1010100001100100': 5, '1001111100100101': 3, '0001001111011011': 1, '1111010110101111': 8, '0001111111111010': 1, '0111010000010010': 9, '0000111110111111': 3, '0101110000010100': 1, '0110000010001110': 1, '1000101101100111': 8, '0111000000011110': 2, '1100101101000000': 4, '1000001101001101': 25, '1101000100110100': 1, '0111000101001000': 9, '1101111000010010': 9, '0101101110011111': 21, '1000101011100110': 8, '0000001001111110': 2, '0010100101100101': 42, '0101101000011000': 3, '0000101101111000': 22, '0111100101001101': 3, '1000001101011101': 32, '0000101001101010': 1, '0000101011110011': 9, '0000101100000101': 7, '1000111001010011': 1, '0101101001100101': 1, '0010010111011101': 2, '0101001100001100': 20, '0011100010100101': 1, '1000101110100010': 7, '1010100110101011': 8, '1101001110011101': 7, '0001101110011111': 1, '0000011011111011': 25, '0111101110110111': 1, '1101111001011000': 7, '0010100110001110': 7, '0100011000110101': 1, '1010010010101011': 12, '1111110000011100': 23, '0011100110110111': 6, '0101001101010100': 10, '1111110001010001': 9, '0111000010000110': 10, '1000011001110100': 29, '0111110011100110': 3, '1111010000100111': 8, '1101011001101100': 1, '1110110111000101': 1, '1001101010101011': 1, '1000001100110101': 5, '0010000101111100': 24, '0111010010001000': 6, '1110100001101000': 1, '1110110001000101': 4, '1000011000001001': 1, '0000111000010011': 1, '1010100010100111': 2, '1000011100000000': 2, '0111110100010110': 2, '0000101101000000': 17, '0101101000100000': 3, '1111010010111100': 7, '0111110001011011': 3, '1110110000010100': 1, '1000001111001010': 22, '1011000100110111': 1, '0100100010101000': 2, '1001101111111111': 1, '1111000000111011': 1, '0100011101000010': 1, '0100101101101010': 1, '1010000101000111': 7, '0010110101100001': 6, '0111100110110011': 22, '1000101101010011': 8, '0001001100100000': 1, '1000100001111100': 1, '1010110011101110': 28, '0111100100111010': 11, '0111110000001111': 7, '1101111011001000': 3, '1111100001001001': 2, '0101101100000101': 21, '0111100011011110': 1, '1010000000001100': 1, '0101101110110011': 33, '1111010000011100': 27, '0101001000010010': 3, '0010010011101110': 24, '0000001111010101': 8, '1010010110110111': 1, '1001111010011011': 4, '1110010001000100': 4, '1010100100111000': 3, '0011110010010010': 2, '1111110000010011': 5, '1111000110010111': 31, '0010010111110110': 3, '0101001100100101': 20, '1110

100101000101': 1, '1000101001110111': 1, '0111100101010000': 8, '1111010011000100': 1, '1001011010111101': 1, '1010010001111110': 2, '0101111011110010': 11, '0010000101011011': 6, '1010100011110011': 23, '1101111011000011': 4, '0010110000000110': 1, '1000101110001110': 8, '0010000101111010': 5, '0110110101100000': 1, '1101101101000110': 2, '1111000111001011': 3, '0100111011100110': 4, '1000001100111001': 4, '0010100001011011': 2, '0010010101101111': 2, '0101001110111110': 26, '0001011100101000': 1, '1010110001100000': 24, '1010100100110101': 2, '1001101111010111': 1, '1010110101010010': 1, '1000011011001100': 6, '0000101101110101': 17, '1000111001100011': 5, '0101101000010101': 5, '0110100101111111': 1, '1111100110100000': 5, '0110101101011011': 10, '0000000010111111': 1, '0111000000110111': 1, '0001101100010101': 2, '0111000100011000': 23, '0111110110100001': 2, '0101011000001011': 6, '0111000100100101': 23, '0111110001100010': 1, '0111100101010001': 8, '1111010011000101': 2, '1000101001110110': 1, '1110100101000100': 1, '1110110100100011': 1, '1001011010111110': 2, '1010010001111101': 31, '0111010011010111': 7, '0000111101010101': 6, '1011100110011111': 4, '1111100110001001': 5, '0100001011001011': 2, '1100011001111100': 1, '1111110101010100': 2, '0101111010101110': 23, '0010000100100101': 3, '1000101101010001': 22, '0111110100100110': 1, '1010110111001010': 10, '0101101010001010': 5, '1111000101011001': 6, '0101101111001010': 4, '1000001111111011': 20, '0000111110101101': 1, '0111010000100000': 20, '0101111010110110': 24, '0000001011001100': 1, '1101101000000011': 2, '0101001000101010': 2, '1000001010100111': 4, '1000001011001110': 7, '0111000110111101': 3, '0000000110101111': 1, '0100001101111101': 5, '0101010010100110': 2, '1111010000110100': 23, '0111110011110011': 4, '0000011111001010': 5, '0010010001111011': 8, '1111010010000011': 28, '0000101111110111': 16, '0101011110101011': 2, '0101001110001001': 8, '0111001101010100': 1, '1000011101010101': 8, '0000111101001011': 2, '0101011110011010': 7, '0100111101001101': 1, '1101011100101000': 5, '1111000111101110': 3, '0010100100110111': 2, '1000001001001100': 7, '1010100101101001': 14, '1101001100000010': 6, '1110010010101011': 2, '1111110010111010': 19, '0100111110101011': 1, '0101111011110011': 4, '0010000101011100': 16, '0111010110011000': 2, '1010010011110010': 24, '0101000110011111': 1, '1001111000000001': 3, '0101001100010000': 27, '0010010111000001': 3, '0001011000001011': 1, '1000001011011001': 2, '1010010100010110': 1, '0111010000010011': 5, '1000001110101010': 7, '1100111111010110': 1, '1101011110010001': 3, '0101101110001011': 16, '1001101100101000': 2, '1001001001111111': 1, '1101101000100101': 6, '0011000101111100': 1, '0111100010011011': 10, '0000111011000010': 23, '1000011011110100': 8, '0010010010010011': 3, '1101011000110000': 20, '0111110010111100': 8, '1101101100111101': 19, '0100111001000111': 1, '0000001100000011': 2, '1111010001111110': 2, '0000101001111101': 4, '1101101111100111': 5, '1111100100000101': 18, '0010110101000000': 8, '0111011010101110': 1, '1111110100010100': 5, '1111110010110010': 27, '1000001110100010': 7, '0000111110110100': 1, '1000101001101001': 5, '1010000011010110': 3, '0111000111101110': 4, '0110000111100010': 4, '0100001100001110': 1, '0000101001110011': 3, '1111100100001011': 5, '1111010001110010': 1, '0000001100001101': 8, '1100111001010010': 1, '1101001100101101': 21, '1010100101001101': 24, '0001011100111100': 1, '1011000101110100': 1, '0011100101110101': 1, '0000001110010110': 6, '0010000011010110': 3, '0001111100000101': 1, '0111010000100011': 11, '1000001111111010': 14, '0111100110011100': 9, '1101011101111001': 3, '0101111101011101': 4, '0011010100100100': 1, '1000111010100100': 5, '0011010000101010': 2, '1011000100011111': 1, '1111100011110110': 3, '0111010100000010': 1, '0100111011111110': 4, '0011010111110110': 1, '0000101100000000': 5, '1000111001010110': 3, '0101101000001000': 6, '1000111001110010': 4, '0000101101101000': 20, '1110010101000000': 1, '1100001111011101': 1, '1111110010111110': 23, '0000000000100100': 1, '1110010010101111': 1, '0010000111010001': 6, '0000111101100100': 11, '1111100000000011': 2, '1000001001100001': 6, '0000001000000101': 2, '1000001101010011': 3, '0001111001001110': 1, '1010000111001000': 5, '0000101011101000': 2, '1111100110110101': 8, '0101001110000010': 15, '0011000111010110': 1, '0100001001011100': 1, '1010000011101011': 5, '0010110001001100': 19, '1010010000110001': 9, '0101000111011110': 1, '1011110110110011': 2, '0011010000011001': 2, '0101111010010010': 27, '1011010011101011': 3, '0010010011010010': 24, '0101101100011011': 8, '1101111011011000': 1, '1100101001

110000': 1, '0111010100011100': 9, '1110100100111100': 1, '1000111010010110': 4, '1111110000010100': 15, '0000111001011101': 18, '0010100101010101': 21, '0000101010101010': 1, '1000101111111110': 23, '1101011110110100': 4, '0011010010000000': 1, '0101111000101001': 17, '1010000101100111': 6, '1101101110100010': 16, '0101001010110100': 3, '1111010010010010': 24, '0101101101011000': 2, '0100111011001011': 2, '1101101100101011': 4, '1000011001111101': 14, '1100011011100011': 3, '0111000010001111': 5, '1010010010100111': 9, '1110100100010000': 1, '0111010100110000': 1, '1110110101010101': 1, '1000001111100101': 7, '1100111001010011': 1, '1101001100101110': 9, '0000001000001101': 2, '1111100000001011': 2, '1110101101011110': 10, '1100011001011101': 1, '0000111101110101': 6, '0000011111000100': 2, '0010010001110111': 7, '1110010101010101': 1, '1111010010001111': 16, '1101111001001001': 4, '0000101111111011': 21, '0101011110100111': 5, '0010010001100111': 4, '1111110110001110': 6, '1100011011111000': 1, '1111110110100100': 3, '1110101001111110': 4, '0111110010011101': 6, '0111010101011011': 1, '1110100101111011': 2, '0101000010010110': 1, '0101101101010100': 8, '1111000100100011': 5, '0101101100110101': 22, '0111110000100000': 23, '0111110010001001': 2, '1001001100110101': 1, '0010100100101001': 8, '0100011111000110': 1, '0000011001111100': 17, '0000001011101011': 9, '1000011101110111': 2, '0000011101000100': 7, '0101011000001101': 28, '1010011011100011': 1, '0111110110100111': 5, '0111000000110001': 9, '0001011000110101': 2, '0111110001111001': 5, '1111010011011000': 2, '0111010000011101': 27, '1000001110100110': 7, '1111110110110111': 7, '1000011011101010': 14, '1011010111011011': 1, '1110110011110011': 3, '1101111000010111': 4, '0101101110011100': 6, '1101001000011000': 7, '0000001001111000': 5, '0101001110000110': 20, '1011110011101011': 2, '1001001111001110': 1, '0101001100101111': 3, '0010010111111110': 5, '0111110001011001': 9, '1111010010111000': 10, '0000111111010000': 2, '0111100010001010': 4, '1000101011101011': 9, '0000001001110001': 2, '1001011000000101': 2, '0010100101101010': 9, '1111110010110011': 14, '1111010110000010': 3, '0101110010110111': 1, '1000001101101000': 20, '1011000010001010': 2, '0011000100100101': 1, '1010100001000001': 10, '1111110111001110': 3, '1010110000111100': 1, '1010100100001101': 6, '1110010001011111': 1, '1010010110101100': 2, '0101001110101110': 15, '1111000110000000': 4, '1111000010001001': 1, '0100101101011011': 1, '1010010101110100': 5, '0110010011111100': 1, '1111110100101110': 2, '1000111100000011': 1, '1101011001010100': 9, '0000101110001011': 7, '1010110111101011': 3, '1110010001100101': 2, '1011011010100011': 1, '0100111011010001': 1, '1101101101010001': 5, '1111010010011001': 5, '0100101111011111': 2, '1000111011110011': 17, '0101101010100101': 2, '1010010011010011': 22, '1111010001101101': 1, '1101011011101001': 2, '1000001101111111': 7, '0000101000001100': 4, '0111100010000110': 5, '1110111111011011': 1, '1111000110010011': 24, '1010010101100111': 3, '0101001100100001': 24, '0010010111110010': 3, '1101100100100100': 1, '0010100111010000': 5, '0000111110100110': 2, '1000001111110000': 8, '0111010000101011': 7, '0111100110010010': 29, '1101001011001010': 1, '0111010001110010': 2, '1101101100001000': 20, '0000001011101010': 5, '1000011101110100': 2, '1000111111011101': 1, '0000111010001001': 5, '0000011101000111': 1, '0000011011110000': 3, '0001101110010100': 2, '1101001110010110': 31, '0000111011011111': 19, '0110010001010000': 2, '0110100101100100': 3, '1000111011111111': 34, '1000101010110110': 2, '0100101111010011': 1, '0000111001110101': 17, '0000011101110011': 1, '1101111000111100': 16, '0101101100100001': 30, '0111110101011101': 3, '0000101100011100': 6, '0101101001111100': 1, '0111100001010011': 1, '0010110010000000': 3, '0111100110001101': 6, '0010000001100000': 8, '0110110000101101': 2, '0010110000000010': 1, '1101111011000111': 3, '1000101110001010': 10, '0010000101111110': 4, '0010110011111100': 5, '0111010001110110': 6, '0101101100100100': 22, '0101011100101001': 9, '0100001101000011': 2, '0110000011101110': 1, '0111000110100011': 33, '1101011111100000': 1, '0011010001110100': 3, '1111010110101101': 3, '0101111001110011': 3, '1101111010111010': 26, '0100011101001001': 2, '0101001100000000': 25, '0010010111010111': 6, '1111110001100011': 1, '1000101110101010': 3, '0011100010101111': 1, '0101011011000010': 3, '1001011110001011': 1, '0010110010000011': 6, '1000110001000101': 2, '0101101100011000': 23, '1010000010100010': 2, '0000111100011110': 2, '0111100110001011': 31, '0010000001100110': 2, '0011010100101011': 2, '1000111010101011': 4, '0010110011000011': 2

4, '0010110100011001': 1, '0010100100000011': 1, '1111000110111010': 26, '0100011001
111111': 2, '0000101110101011': 7, '0110000101100100': 2, '0101111100001000': 4, '01
01010110100011010': 21, '1010010001100001': 27, '0100011010101010': 1, '000011110101101
1': 1, '0111110101110101': 1, '0001011010000011': 3, '1000111010100011': 14, '001101
0100100011': 1, '0101111101011100': 3, '0101101111100111': 3, '0011110011110001': 2,
'0111100110010111': 23, '1010010001010110': 6, '0101101111111010': 5, '0110000001001
100': 3, '1100011010110100': 1, '1110110011011001': 1, '0101101110000001': 6, '01000
01111101010': 1, '0010010111000111': 8, '0101001100010110': 12, '0111000100001010':
4, '1010010100010000': 2, '0001011000001101': 2, '0110000111110111': 2, '11101001001
11110': 1, '0111010100011110': 3, '1000111010010000': 2, '1001101110000011': 3, '110
0001001110001': 2, '0101111101111100': 1, '1111100111100011': 8, '0111110100111001':
7, '1110010110000011': 1, '0000011111010000': 2, '0010010000100101': 7, '00101100011
11101': 22, '1000011010010110': 2, '0000111010000000': 2, '1101101100000001': 19, '0
010110101100000': 4, '0111100110110010': 31, '1010000101000110': 4, '000001111011000
1': 1, '0010010000000100': 3, '1010100000100101': 4, '1111110010101011': 22, '010101
1000101100': 22, '0111000101110101': 7, '0100011011110110': 3, '1101001101010010':
3, '0101001010101000': 1, '0010000110001010': 6, '1010010010100110': 8, '11111000111
11110': 1, '0111010100001010': 1, '0100111011110110': 3, '1000001111011011': 23, '11
01101000001001': 5, '1000101111110001': 10, '0111010011100011': 4, '101111001000100
1': 1, '1000101011010000': 3, '0010100101010001': 26, '1100001111010111': 2, '000100
1100000101': 4, '1010001111110011': 1, '1000111001111010': 5, '1001111010111011': 2,
'1100011111010000': 1, '1101101110000000': 2, '1001101110110001': 3, '01011010110101
00': 2, '0010100101001010': 5, '0000011001000110': 11, '0100011001000000': 1, '01100
10000001101': 1, '0010010010011010': 4, '0101011010100110': 23, '0111100101001000':
3, '0011110000110011': 1, '0111100010001110': 5, '1011000010011010': 1, '11010111101
00100': 1, '0001111100111000': 2, '0111010001010110': 1, '0010000111111010': 24, '00
10000111101110': 25, '0100111100011101': 1, '0011100101010110': 1, '000100111001111
1': 3, '0101001100010101': 32, '0010010111000100': 3, '1111110010011000': 9, '101001
0100010011': 1, '0111000100001011': 5, '1101011001111000': 1, '1000100101101101': 2,
'1110010001110001': 2, '1010110011011010': 20, '1000011001100111': 6, '0000111000110
001': 4, '1010100011000101': 2, '1010110101100010': 2, '1111000000001001': 8, '00001
11001001101': 28, '0000001011110001': 1, '1111110100111001': 7, '1100111011100101':
1, '0111010100100100': 5, '1110100100000100': 1, '1010010011110100': 5, '01111001010
11000': 6, '0111100111101110': 8, '0000111011001010': 18, '0111100010010001': 4, '10
01001100111101': 2, '0111110000101010': 5, '0111100100011011': 4, '111001000100101
0': 1, '1001111010010111': 4, '1101111111010110': 3, '1010100100001011': 3, '1010100
001000111': 1, '1111110111001100': 1, '0001111011011011': 2, '1000111011001111': 22,
'0110000010100111': 1, '1110110000011010': 1, '0011110000111001': 3, '10000011110001
00': 6, '1001001000101001': 1, '1111010010110110': 22, '0111110001010111': 2, '11011
1111110011011': 11, '1101001100100110': 10, '1101101111100010': 5, '1111100100000000':
25, '0010110101000101': 4, '1101101100111010': 2, '0111110010111111': 28, '110101100
0110101': 27, '0101001110011110': 23, '1111110011000010': 5, '0100101010100010': 1,
'0000011111001000': 1, '0100111011101011': 5, '1010101001010001': 1, '01101101011011
01': 2, '1111000111000110': 5, '1110010101011001': 2, '1101111001000101': 3, '101011
0000001100': 9, '1111100100110001': 21, '0010110110010110': 1, '0101011011111101':
2, '1111100111001010': 1, '1101011110010111': 6, '0000101011111111': 4, '01010010011
10001': 3, '0010100111000111': 27, '1000101101100011': 12, '0101110000010000': 3, '1
001001111110111': 1, '1010000110010100': 2, '1111100110010101': 3, '111101010110100
0': 1, '0100011111011111': 1, '0000111101001001': 5, '1000100011000111': 1, '1010110
000011001': 2, '0101101100111011': 7, '1101111100010001': 7, '1110110001111000': 2,
'0101101101100010': 1, '0010010011001011': 18, '0111110100000010': 1, '0000101101010
000': 18, '0101101000110000': 8, '1010010011111111': 22, '1010110011110100': 8, '000
1101010100011': 2, '0010010000100010': 2, '0000011111010111': 9, '0101011111010010':
3, '1010000111011000': 4, '0010000101011001': 16, '0111010110011011': 7, '0111000010
101110': 3, '0001011010101010': 1, '1000001111011101': 7, '1101101101110000': 6, '11
01111011010101': 2, '0010110001010010': 3, '0011000110010111': 2, '100010110011110

0': 6, '1101001000011100': 4, '0111000101001111': 1, '0101101110011000': 7, '0100001
110101111': 1, '1000011011100111': 23, '1010100110000110': 9, '0000101111011010': 2
8, '0101101010111010': 7, '1101000100000000': 2, '1100111010001110': 1, '11010011011
10000': 9, '1010110000101000': 8, '0100011011010100': 1, '0000011011010010': 18, '11
01111101001101': 1, '0111000110001011': 25, '1101011110010101': 5, '0001001000010000
0': 1, '1010000100111101': 5, '1111000100010011': 2, '0101011110000001': 1, '1001111
100010011': 1, '0101011001001101': 4, '1000111111100100': 3, '1100001100010000': 1,
'1101001110111000': 5, '1010110101111100': 7, '1111110111010100': 1, '11100001000011
01': 1, '0001111011100111': 1, '1011010010100110': 2, '1101111010010001': 9, '000010
1011011111': 7, '0110010001000111': 2, '0101100100110111': 1, '0010100100001100': 9,
'1111000110110001': 6, '1000001001110111': 2, '1111100000011001': 11, '0000111110101
111': 1, '0111010000100010': 5, '0111100110011011': 27, '1000011011011100': 7, '0000
110001000100': 1, '1001101100000000': 6, '1010110010011001': 2, '1000011011010000':
5, '1001101100001100': 3, '0011010000110000': 3, '1011000100101001': 1, '00000111110
11110': 9, '1001101110010010': 1, '1010000101010110': 7, '1010000100100100': 8, '100
1111110010010': 1, '1101101110011010': 27, '1100011111101010': 1, '001000011100001
0': 20, '0000001111100010': 27, '1000011101000001': 10, '0000111001010010': 4, '1111
110010001010': 19, '0010111001100001': 2, '1000101111000111': 36, '100011101110000
0': 9, '0101101011110110': 2, '1101000110101111': 2, '0010110001001010': 6, '0001111
101111000': 1, '0110110010001001': 1, '1101001111000010': 3, '1100101101101001': 2,
'1000001101101101': 31, '1010010111000010': 4, '1110010011111011': 5, '1100011011010
100': 1, '1000101100000001': 3, '0001011100001100': 1, '1111100010110011': 8, '11011
01000010101': 4, '1010110011101000': 5, '1010000100011001': 6, '1111100100011000': 1
8, '0111100101000100': 5, '1111010010110000': 9, '0111110001010001': 7, '10000011110
00010': 20, '1000011101011100': 8, '0101101110110010': 24, '0010010011111010': 25,
'0000110001101001': 1, '0111010111001110': 1, '1010110011000001': 11, '0101111010001
010': 16, '1000111111110101': 3, '1110010011000111': 2, '0101111110100111': 4, '0010
010001100001': 18, '0010110000101111': 1, '0111110000100001': 24, '011110010001001
0': 8, '1100101101100100': 3, '0000101100111101': 4, '0101101001011101': 3, '1011100
100011001': 3, '1010000001101001': 5, '1010000100100000': 8, '0011100110100100': 1,
'1101001010001110': 5, '0101001000000110': 2, '0100110011000111': 1, '000010011001111
01': 3, '1000001101000110': 9, '0000101001010101': 5, '1101011010110011': 26, '11111
00010001110': 8, '0001101110011011': 2, '0000011011111111': 21, '0111110010101010':
18, '1101111100001111': 1, '0001001000110000': 1, '1111000100100101': 27, '001000000
1111001': 4, '1001011010011110': 4, '1000111101001001': 6, '1101011000010110': 7, '1
000011111100011': 7, '0110010011011110': 2, '1011100110100011': 2, '000100101110101
0': 1, '1101001100110101': 21, '0010100011100010': 7, '0111110111100110': 3, '110110
1100001111': 7, '0000111101100010': 4, '0010000111010111': 19, '1111010100000111':
2, '1101101100001011': 7, '0000111101100110': 1, '0010000111010011': 19, '1001111000
110100': 4, '0101011110001100': 3, '0011110010011110': 5, '1000111000000100': 5, '10
01101100110101': 4, '1101101110100100': 5, '1010000101100001': 28, '011100010011010
1': 26, '1010100011101110': 3, '0001101101011100': 1, '0010000100110011': 3, '000101
1100111000': 3, '0000011100100001': 1, '0001001010111110': 1, '1100001101101011': 1,
'1000011110010110': 1, '1011000110011011': 3, '0111010001010100': 7, '11011011011000
10': 2, '0010000111111100': 6, '0010000101010010': 1, '0101111011111011': 5, '100100
1000010000': 1, '1010010011111100': 6, '0101000110010111': 1, '0011100010110000': 1,
'1000101111010101': 4, '1000100101111100': 2, '1110000000100100': 1, '000101101001011
11': 4, '0000111010101010': 11, '1111010100100111': 2, '1001001110110000': 1, '00001
01101011110': 8, '1000001110001001': 2, '0101101000111110': 2, '0101011111111110':
2, '0000001011110101': 1, '0001011000111100': 1, '0001101100011110': 1, '10100100101
01111': 7, '1000101001001010': 2, '0110110011100010': 3, '0000111010110101': 1, '101
0100000101001': 4, '1000111011111011': 23, '0100101111010111': 1, '100010101011001
0': 1, '0101101100010111': 10, '0001010000111100': 1, '0101011010011111': 27, '00100
10011001111': 32, '1011110100111100': 1, '1111100001010001': 1, '0000001110001011':
9, '0010000011101011': 5, '1111100110001101': 4, '1011110010101110': 2, '01011110011
01100': 3, '1100001100111000': 1, '0000001110000110': 10, '0010000011100110': 3, '10

11110010100001': 1, '1111100110000000': 10, '1100011100010010': 1, '101011001110111 1': 22, '0001001100100011': 2, '0011110110000011': 2, '1011000101001101': 2, '010001 1001110100': 1, '0000101110100000': 3, '1110010111001000': 2, '0110000101101111': 2, '1000100111011110': 1, '0101101110000101': 3, '0000011001010110': 6, '01111000001101 01': 9, '1101111010100111': 15, '0010110001100010': 4, '0010010001011100': 23, '1010 100000000101': 1, '1000011010100111': 7, '1000110001000000': 1, '0111100001010101': 3, '1010000010100111': 4, '0100011011101111': 5, '0010110010000110': 7, '10101000011 01101': 8, '0111010000110101': 20, '0010000100010010': 2, '0011000110100110': 2, '10 10100111110111': 23, '0001001111001111': 1, '1000011011111100': 5, '000011101100111 0': 20, '1101101011110110': 4, '0101111010000011': 16, '0101111011000111': 5, '01111 10011011011': 4, '1111010000011010': 6, '1101101110100101': 7, '1010000101100000': 3 2, '1010110111001101': 1, '0101101010001101': 2, '1111100110110010': 26, '1000011111 000010': 7, '0101101110100001': 5, '0101011000110111': 13, '1000111010100010': 7, '0 101111101011011': 2, '1000101101101101': 22, '0111000000010110': 2, '001110000010010 1': 2, '0001011000000010': 1, '0111000100000111': 6, '0010010111001010': 6, '0111000 101111000': 8, '1101111001100010': 1, '1101001000000111': 2, '0111010010111011': 24, '1001111010010110': 2, '1000111011011110': 15, '0110000101101001': 2, '0101111100000 101': 5, '1000101101011111': 6, '0101111010100010': 25, '1111010000110000': 23, '011 1110011110111': 4, '1111110000001111': 11, '1000011000000101': 5, '110100111011011 1': 34, '1111000101001111': 2, '1010000100000111': 1, '1111100100100100': 25, '00010 01000011100': 1, '1101101101100100': 1, '0111010001010010': 3, '0100111100001111': 1, '0010000111111110': 23, '1010100011111110': 8, '1011100100010101': 2, '1100101101 101000': 3, '1101001111000011': 4, '1010110111110111': 8, '1001101101011000': 1, '10 10110001001111': 7, '1010100101011100': 26, '0101011110001001': 2, '000011110111010 0': 3, '1011110011100110': 2, '0000011011011011': 21, '0111000110000010': 25, '00000 01111010111': 18, '0101001000010000': 3, '0110010011011100': 1, '1101001100110011': 4, '1000111111001010': 4, '0010011001010101': 2, '0010010011011101': 6, '01011011000 10100': 26, '0100010001111100': 1, '0111000100100000': 22, '1000111101101101': 8, '0 111000111010111': 9, '0010010000010101': 2, '0101111110110011': 5, '110100010011001 0': 1, '1101111000010100': 23, '1100011001001101': 1, '0111000100101001': 20, '01010 01010110000': 3, '1111010010010110': 25, '1000111101111000': 5, '0010100000111000': 2, '0101001111010011': 6, '1010110011111111': 25, '1001111010001111': 1, '0111100000 011100': 8, '1010000011101010': 6, '1100101001001110': 1, '1101011010111100': 6, '11 11110010000101': 2, '1011000100110100': 6, '0100011000001101': 1, '000001111000110 0': 2, '1111000000111010': 3, '0011000111000101': 1, '1000001001011101': 5, '0000101 001001011': 2, '0111000000001111': 1, '1000001011010001': 1, '1111110010010101': 5, '0101001100011000': 25, '1001111110000111': 1, '0100001011111011': 1, '0010000110110 111': 3, '0110010001011010': 1, '1000111011110111': 18, '0100101111011011': 2, '0101 101010100001': 1, '0111010010100001': 8, '0111000011101010': 1, '1000101110110011': 3, '0111110010001010': 19, '1111010011101011': 7, '1110100101101100': 5, '1001001101 011101': 2, '1000001110100100': 2, '0111010000011111': 2, '1100101101110001': 4, '11 11000100111110': 6, '1101001111011000': 3, '1000011101001011': 1, '111111001100100 1': 1, '0000111001011010': 8, '1111000000011001': 6, '1010000101011010': 5, '1101101 110011101': 9, '0010000111000111': 21, '1010100110000101': 3, '0010110010001110': 1 4, '0111100001011111': 3, '0000001011111000': 1, '1010010010010010': 3, '11001011110 00110': 4, '0000111011100110': 22, '1110000100100010': 1, '1011010010100111': 4, '00 11010100111100': 1, '1101111010010000': 14, '0100011000111110': 2, '110111111011110 0': 3, '0101011000111010': 5, '1111110000100100': 21, '1000011000101100': 5, '000100 1010000110': 1, '0101101100110100': 28, '1010010110101110': 3, '0101001110101100': 5, '0110100100110010': 1, '1111110010110110': 27, '1110010010100101': 1, '0101011010 010001': 8, '1001101000111101': 2, '0111000110110101': 4, '0011010001111000': 1, '10 10010001010000': 19, '0111000111110010': 1, '1010100111100101': 9, '101011011100111 1': 3, '0101101010001111': 4, '1111111010111110': 1, '0100101100110001': 1, '1010010 011101111': 28, '1000111100110100': 3, '1101011010000001': 7, '1011000110100011': 3, '0010100001110100': 3, '1000001100011100': 1, '0110110011101111': 3, '00101001111001 00': 5, '1101100100110000': 1, '1000101001000101': 8, '0000111010111010': 2, '010111

1010001001': 8, '1101001110001101': 2, '1010010001001000': 28, '0010010010000110': 9, '1001101100000001': 3, '0011010110110010': 1, '1000011011011011': 21, '1011010010 011111': 3, '1000111010000010': 8, '0101001010100010': 6, '0101011100000001': 4, '01 01101110111011': 26, '1001101000110111': 1, '0111000110111111': 32, '011111000011001 0': 2, '0110110011001010': 2, '1010010011000011': 18, '0111000100100100': 23, '10111 00110010111': 2, '1111010101011100': 3, '0111000001010011': 1, '1111110000101011': 6, '1000011000100101': 5, '1110100101010101': 1, '0111010101110101': 2, '11110100110 10110': 6, '0111110001110111': 3, '0010000101101111': 4, '1010011011010110': 1, '111 1000011011110': 2, '1010100011110110': 8, '1000111011011011': 24, '100000001101111 0 1': 1, '0101111100000010': 1, '1010110100100100': 2, '1001101110100011': 1, '0111000 000101010': 3, '0001011000101110': 2, '1110000001111101': 1, '0000111011110011': 28, '1010000100101100': 4, '0000011000110001': 5, '0011010101111001': 1, '10001110110110 01': 6, '0000101110100011': 3, '1000111010110110': 1, '1111000010000011': 9, '110111 1001110111': 1, '0111000101100001': 2, '0111000000101000': 6, '1101001001110100': 2, '0010100100001101': 7, '1111000110110110': 24, '0000001000010100': 1, '1000001001110 000': 5, '1101101010001011': 5, '0000101101011111': 3, '0111110100001101': 8, '11110 10100100100': 9, '1001001110110011': 2, '1001111110111111': 1, '0100111111111010': 1, '0010000110001111': 6, '0000111011010110': 28, '0010010101010111': 3, '0101001111 000110': 5, '0010010111011011': 10, '0101001100001110': 2, '1000101110100100': 2, '0 010111010000110': 1, '1111110001101111': 1, '0111110100100001': 8, '110101100000101 0': 5, '0010010001000110': 7, '0000001011010110': 4, '1011000110001001': 1, '1100001 101111001': 3, '1010010011101011': 14, '0100101100110101': 3, '0111110110100101': 1, '0101011000001111': 2, '0111000000110011': 2, '0001011000110111': 1, '00011011000100 01': 2, '1100101101101011': 1, '0000101100110010': 1, '1101111010001011': 21, '10001 11001100111': 4, '0100001101011000': 7, '0000101101110001': 16, '0101101000010001': 6, '0011010111100111': 1, '0101011010011100': 7, '0101101110101001': 6, '01110100110 00011': 4, '0101111100000000': 3, '0011010100101101': 2, '0101111101010100': 2, '100 0111010101101': 3, '1100111011101010': 2, '1000101011110011': 7, '0111010010110111': 23, '1000101111100101': 3, '1011000011101010': 1, '1011010010010001': 1, '1000111010 001110': 5, '1010000111101010': 22, '0011110000100100': 3, '0101101111111011': 2, '1 001011011010100': 1, '1010010001010101': 21, '0000101001010110': 1, '110010110100101 0': 2, '1000001101000101': 32, '1011000111011110': 1, '0111100011000010': 2, '110001 1000110100': 1, '0010110011110101': 11, '1010000100011100': 3, '1111100100011011': 6, '1011100100100011': 1, '0100001101000010': 2, '0000000111110000': 1, '01110001101 00010': 22, '0010100001100100': 13, '1010000011001100': 5, '0101011010101111': 26, '0010000010001110': 2, '0000001111101110': 31, '0101011010000011': 19, '100111100111 0001': 1, '1010000010110110': 2, '1011100000001010': 1, '1010100111011110': 22, '011 1100110011000': 6, '0101001000001000': 3, '0110010011000110': 4, '1101101101100101': 1, '0111010001010011': 3, '0010000111111101': 6, '1010110111010000': 1, '00001011100 10000': 2, '0101001111011100': 3, '1101011110001000': 2, '0110010000111000': 1, '110 1001010000010': 3, '0101001000001010': 1, '1010110000010111': 2, '1010100100100100': 5, '0001111011110100': 1, '1111000100101001': 20, '0110100100010100': 1, '0000111001 101110': 3, '0111110010100011': 22, '0101111011110001': 3, '0011110000001100': 2, '0 010000101011010': 5, '1010010011110000': 6, '1000011011011000': 4, '101011001001000 1': 1, '1010110110101111': 5, '1111100011110011': 3, '0111010100000111': 1, '0101101 110001110': 19, '1010000001100110': 2, '0101011101101001': 2, '0101101111011111': 4, '0010110011100101': 4, '1111000110010100': 6, '1000111011001000': 5, '10100101011000 00': 4, '0010010111110101': 2, '0101001100100110': 3, '0010000100010001': 7, '111010 0001001001': 1, '0111001100100100': 2, '1101011010000100': 6, '1000111100110001': 3, '0000011100000101': 1, '1111100110110011': 26, '0010000100001010': 4, '1010001101100 101': 1, '1000111010011001': 1, '1001101010010110': 1, '1111101111110001': 1, '00111 10010000101': 3, '0110110110101111': 1, '0011100000100111': 1, '1111010110000111': 1, '0101111000101101': 20, '0000011011111100': 6, '1101001110011110': 22, '011011000 1100101': 2, '1101111111111111': 2, '1100101110000101': 1, '1101001111100010': 3, '0 000011110101111': 4, '0010010001011010': 3, '1111110001110111': 2, '101010001101110 1': 1, '0010010111100011': 5, '0101001100110010': 6, '0010100111101100': 7, '0000111

010110110': 5, '1000001111100011': 23, '0000011101100100': 5, '1101111100001001': 4, '1000101100001101': 9, '1100001010000001': 1, '1100011011011010': 2, '1110010011110111': 3, '0000111011101100': 5, '0000111011011101': 10, '1010110101000100': 9, '1100001010101100': 1, '1101011100001101': 8, '0010100101010111': 6, '1111100111111111': 1, '1101111010101011': 16, '1110110001101111': 1, '1000001011010110': 7, '0111000000001010': 1, '1111110010010010': 20, '0000111111001110': 10, '1101001110010000': 4, '0001101110010010': 1, '0000011011110110': 17, '1010010011010100': 7, '0100110011111011': 1, '1111010001101100': 6, '0101000100110011': 1, '0111010100001000': 6, '1010100011110101': 4, '1110000111000110': 1, '1000001111111000': 4, '0010110010010111': 2, '0101000100010000': 1, '1101101001101001': 1, '1000001000011100': 1, '1101011011100111': 8, '1010110011010100': 5, '0000000101100001': 2, '1000101001000000': 6, '1101100100110101': 1, '0010100111100001': 6, '0000111010111101': 1, '0100011101111100': 2, '1010110101101000': 7, '1010110111011101': 1, '0000101110011101': 1, '1010100101111000': 25, '0101000100101100': 1, '0000001111100101': 6, '0010000010000101': 1, '0100001111110010': 1, '1011100111111111': 1, '1111000111100111': 2, '0010100100111110': 1, '1000001001000001': 5, '0000001000100101': 1, '0010100010100010': 4, '1010010011001010': 21, '1111100111100111': 5, '0001001011011011': 1, '0110010111111010': 2, '0001001111110110': 2, '1111100010101010': 6, '0110000111010011': 3, '0111000101011100': 8, '0010100111110101': 5, '1101111000001110': 6, '1000101001010110': 1, '1111010010100001': 6, '0010110111000011': 7, '1101100100001001': 1, '1111110100100101': 8, '0010100001001100': 8, '1000100101000000': 1, '1101011001011101': 5, '1000111100001100': 3, '1010110010110111': 4, '0010110010001111': 10, '1000111111001000': 2, '1111100101000100': 4, '1110000011011110': 1, '0111100111111000': 1, '1101101111001001': 2, '0010100101110000': 20, '0000101011001101': 1, '1101001000111001': 7, '1101001011110110': 1, '1111100110011011': 20, '1011110011111110': 1, '0010000110010110': 3, '0011000100010001': 2, '0100011100111101': 1, '1110000001000101': 1, '0101111111001100': 1, '1010100011000100': 1, '1000011001100110': 9, '0000111000110000': 4, '0100111101111010': 1, '1000011111011010': 6, '0101011010001100': 10, '1011010010010011': 2, '0010100001101110': 2, '0111010011110110': 9, '0111000010111111': 3, '0001011010111011': 2, '1111010111000011': 1, '1010011010000111': 1, '1010110101000001': 8, '0011010010100000': 1, '0111010000010101': 20, '1000010111010110': 1, '1111100100011100': 23, '1101101111011110': 5, '1011100100100010': 1, '1010000100011011': 1, '1111110110111010': 6, '1110000101100001': 2, '0111000110001001': 7, '1010110000101100': 5, '1101011100011101': 3, '1101111110110100': 4, '0000101110010111': 3, '1010110111010111': 5, '0111110011010010': 8, '1111010000010001': 12, '1110000111100001': 3, '1010000111101110': 17, '0010010000111100': 9, '1000011111111010': 7, '0100011011010010': 2, '0000011011010100': 5, '1101111110100111': 6, '1101001110001111': 19, '1101011111101011 0': 4, '0011010001100010': 1, '0000111111111100': 3, '0010000101001111': 2, '0111110110110010': 7, '0101001010111011': 4, '1111010010011101': 8, '1000001101100000': 24, '0010000100111100': 6, '1010011010100011': 1, '0111000010000000': 2, '1010100010110100': 1, '0000111000101000': 9, '1100011011101110': 2, '1000011001110010': 5, '1101011001101110': 1, '1011000111001100': 1, '0111110011100000': 4, '1111010000100001': 27, '1110000111110001': 1, '1011010110011110': 1, '1001011101001001': 1, '1010100111111110': 24, '0010000111011101': 3, '1101101100000101': 17, '0000111101101010': 2, '1000011010010010': 5, '0000111010000100': 2, '0111001100111000': 1, '1000011101111001': 6, '0111010000011000': 26, '0110110101000100': 1, '1111000010100011': 9, '1101011010100111': 16, '1000001101011011': 11, '0001111001000100': 1, '1110110111101011': 2, '0001101101001100': 2, '1010100011011010': 4, '1111110001110010': 3, '1000001101111100': 21, '1010010011010110': 16, '0101101111101110': 3, '0010110111110011': 3, '1000101101110100': 15, '0111100100100001': 19, '1101111111111010': 1, '1101011010011000 0': 4, '1111000110111101': 12, '0010100100000110': 1, '0101100100111011': 1, '0000001000011111': 1, '1000001001111011': 4, '1101101110111001': 4, '0111000101101100': 6, '1101111001111110': 2, '1100001111000111': 3, '0101000100000100': 1, '1010000011001000': 1, '0010000001101111': 1, '0111100110000010': 28, '0010000101111101': 27, '1110110001000010': 1, '0111011110000100': 1, '0000111011100010': 20, '1111100110001110': 19, '0000001110001100': 3, '0010000011101100': 2, '1010010001100111': 14, '01010

01011110100': 1, '1111010100010100': 4, '0010000111100000': 9, '1001011011110011': 1, '1010010000110010': 3, '1001001010111100': 1, '0101111010010001': 4, '10100100000 11000': 2, '0000001111010001': 1, '0010010011101010': 26, '1010110111101000': 1, '00 00101110001000': 4, '1000001111011111': 11, '0111010001001000': 5, '110110110111001 0': 5, '1000011110000110': 3, '0000011101010111': 2, '1010100101111111': 7, '1101111 110111001': 3, '1000101111111101': 7, '1101011110110101': 2, '0111010011101111': 2, '0101111000101000': 16, '0001001111001110': 1, '1010100111110100': 5, '1011010110010 100': 1, '0110100101000101': 2, '0111010110100001': 3, '0100101111110110': 2, '00100 00000001101': 3, '1001101110011000': 3, '0111110100111111': 4, '0111000110111011': 1 8, '1000100110101111': 1, '1010100101111100': 23, '0000111101111010': 1, '1100011001 010000': 1, '0101011001001001': 4, '1010000100001111': 9, '1111010101111011': 2, '00 11100110110010': 3, '1111110000011111': 2, '1000001111011100': 7, '111011001000100 0': 1, '1101101101110111': 4, '0001011010101111': 1, '0111000010101011': 11, '000011 1000010000': 6, '0010110000111100': 5, '1010000111011100': 7, '0010100011100111': 5, '0100001110101011': 2, '1000011011100011': 23, '1001011000101101': 5, '1010000111111 000': 10, '1101101010110111': 2, '1111010010000111': 20, '1110010101011101': 2, '001 0010001111111': 11, '0000011111001110': 7, '0000101111110011': 17, '010101111010111 1': 3, '0000011100001000': 4, '0000011000000001': 6, '0101001100100011': 5, '0010010 111110000': 2, '1111000110010001': 5, '1010010101100101': 13, '0100111111000110': 1, '1110000111100000': 2, '1010000111101101': 6, '0011110000100001': 4, '001001010100 11 00': 10, '0100011001010110': 2, '1000111010110100': 3, '1111000010000001': 1, '01011 11101101101': 1, '1111000110001000': 6, '1101011100100101': 6, '1100001011000110': 3, '1110100100101101': 1, '0111010100001101': 3, '0100111011110011': 5, '11010011010 10111': 3, '0010001110001111': 1, '0100011011110011': 1, '1010010000011100': 1, '010 0010101110011111': 1, '1000101110101011': 10, '0011100010101110': 1, '111111000110000 0': 2, '0101001100000011': 7, '0010010111010100': 3, '1101001000111000': 7, '1101011 011111010': 6, '1010100101101010': 6, '1010110001011011': 4, '0100001111111000': 2, '0001111010111010': 2, '0111000100111000': 18, '0111010110000110': 1, '0010000110001 001': 1, '1000111011100001': 6, '1010010100001001': 3, '1100111011111010': 2, '01000 11001100011': 2, '0111111010100010': 1, '1101101000001000': 7, '0101111100011100': 9, '1101111010010100': 8, '0101001111101010': 3, '0000001111000111': 18, '0010110111 100110': 9, '0000111000100010': 2, '1000011001111000': 22, '0101001100111110': 3, '0 010010111101101': 5, '0101101100111010': 5, '1010100100101001': 7, '110101101011100 1': 7, '1111000010110101': 1, '1110100011110100': 1, '1011010011111010': 1, '1110000 101111011': 1, '0000101000011101': 2, '1111100101110110': 4, '0100011010110100': 1, '1101001110011000': 4, '0001001111111011': 2, '0000101000111110': 1, '11110100001111 01': 20, '1110100100110000': 2, '0111010100010000': 2, '1101011111001110': 2, '01100 00100111001': 2, '0101111000011011': 3, '0111110111000111': 1, '0011100010110010': 3, '1010110101011111': 3, '0100101111100011': 2, '0101011100101101': 6, '11111001110 11110': 7, '0101011001110110': 2, '1010010010110111': 5, '1000101101101011': 7, '011 1000000010000': 10, '0001011000010100': 2, '0101101111001111': 5, '011001000111100 1': 2, '1010010001101110': 9, '0101111001101101': 8, '1111010010001011': 16, '000101 1010111110': 3, '0111000010111010': 4, '0111010011110001': 1, '1111110011110010': 4, '1111110000000011': 4, '0101001111110001': 2, '1000111000110100': 4, '010101111011010 100': 1, '0000101111001100': 4, '0100001011110001': 1, '0111111010100110': 2, '010100 1010011100': 2, '1101101011001010': 1, '0010101100000001': 1, '0111100110001111': 2 0, '0010000001100010': 5, '0100011001110101': 1, '0000011000110011': 2, '00000111000 11000': 1, '0101001110100101': 7, '0010010100110100': 3, '1010010110100011': 3, '011 1010110110011': 6, '1101001010110110': 11, '0101011001010000': 13, '001010000100100 1': 5, '0010010101110101': 5, '0101001111100100': 1, '1010100110101010': 9, '0010111 010000011': 1, '1111110001101100': 2, '1000101110100001': 2, '1101101100100111': 4, '1010001110011110': 1, '1111000010110010': 9, '0010010001100010': 6, '01011111101001 00': 3, '1111000111011001': 2, '1101001011111011': 2, '1000001001011100': 2, '001010 0100011011': 1, '1100101110011111': 1, '1101111001010011': 3, '0010100111001100': 1 1, '1101001001010100': 2, '0010010001101001': 30, '0001001100101100': 3, '1010110011 100110': 23, '0110100100101100': 1, '1101101010111001': 4, '1010000111110110': 30,

'0011100100010101': 2, '0000001010011010': 1, '0010010101001001': 5, '00101001100000
01': 2, '0111110010011100': 7, '1111010011111011': 4, '1111110110100011': 8, '010101
1000100001': 27, '1000101011010011': 5, '0010100101010010': 6, '0111100111010110':
4, '1010100001000000': 9, '0101001100101001': 14, '0101010000100010': 1, '1000111011
000111': 26, '1111000010001111': 8, '1000000110100110': 1, '1010010101101000': 9, '0
110000010101010': 1, '1000111011000000': 3, '1010010101001110': 1, '100000100000010
1': 2, '0000111001000111': 6, '1010110101101010': 2, '0001101110111100': 3, '1010100
011001111': 3, '1000011001101101': 19, '0000110011110111': 1, '1110100000100011': 1,
'1000011011111011': 22, '00001110011001101': 2, '0111100010010100': 2, '0101001101011
001': 6, '0111100111011111': 7, '1010010101010111': 4, '0101001110000101': 2, '10000
11101011001': 5, '1111000000111000': 6, '1111100110110110': 18, '0010000100001101':
6, '1101101010100011': 12, '0111000010011011': 7, '1101101010100001': 2, '0000011101
011001': 6, '1000011110001000': 1, '0000101100011011': 1, '1000011010101000': 1, '00
10000011111010': 4, '0001001110010110': 3, '0000001011110011': 4, '101000011011111
0': 6, '1111110000111101': 18, '1110110011100111': 2, '1101001101010000': 6, '101001
0000011101': 3, '0010010111010011': 8, '0101001100000100': 31, '0111110000101001': 2
3, '0010100110110010': 6, '0101001001100000': 2, '1010110001010101': 19, '1010100101
100110': 4, '0010100100111000': 4, '00001110100011110': 7, '1000111111011000': 1, '10
00011010011100': 2, '1111100100011110': 9, '0000110111000110': 1, '101110010010010
0': 2, '1101101111011100': 4, '1010000100011101': 4, '1111000111110110': 6, '1100111
110010011': 1, '1000001111100111': 27, '0101101101010101': 8, '0111110010101111': 1
5, '1110010111100010': 2, '1010010100110100': 3, '1011000001011001': 1, '01011110110
11111': 3, '0101111100110100': 6, '0110000101010000': 1, '0000101101010011': 6, '010
1101000110011': 1, '0111110100000001': 13, '1101111000111001': 27, '110101100001000
0': 23, '0010010001101010': 6, '1111110110000011': 5, '1010000110011101': 1, '111110
0110011110': 23, '1011110011111011': 1, '0011100010111110': 2, '0000001111100111': 2
7, '0010000010000111': 2, '0110100011000010': 1, '1000111111100000': 2, '01010011110
00011': 4, '0110100101011011': 2, '0010010101010010': 2, '1111110100011100': 6, '010
1011000011000': 23, '0110110001101001': 4, '1101011010010011': 21, '001111001000000
0': 2, '0010000111111111': 36, '1101101101100111': 2, '0111010001010001': 11, '11111
10010100001': 6, '0101111110001011': 3, '1110100011111000': 1, '0111000110011111': 3
1, '0011100111110111': 2, '0000111111101111': 13, '1011100100111100': 5, '1010101110
100111': 1, '0111010010101100': 2, '1000101110111010': 1, '0000111001101101': 23, '0
000011101101111': 3, '1111000100101000': 18, '0100011010000011': 1, '111101000101110
1': 8, '1100111001111101': 3, '0101001101000101': 2, '0011000110101100': 1, '0010100
010001011': 1, '1000101000011011': 1, '1101101010011111': 5, '1111000010101110': 5,
'0101111100111000': 5, '1101011010101010': 27, '1101101010101010': 8, '1111000000010
100': 9, '0010110101111111': 2, '0101011001111110': 2, '1111100111010110': 4, '00010
11000110100': 1, '1110101111011110': 1, '0111000000110000': 5, '0111110110100110':
6, '0101011000001110': 8, '0111100111111011': 2, '1101101111001100': 2, '00000011010
10001': 18, '1011110010110100': 1, '1100011101000101': 1, '0011100100110010': 2, '11
11110000000000': 4, '1011010010011110': 4, '1000111010000001': 2, '001010010001110
1': 2, '1011100101011000': 1, '0100111111110000': 1, '1001111110110111': 1, '0010000
110000111': 5, '1111111000101001': 2, '0101011010000101': 9, '0111010100100101': 4,
'1010110001101001': 26, '0001011100100001': 3, '0011110010010110': 3, '0111000110110
010': 24, '1010110101000011': 2, '0100001100001011': 1, '0110000111100101': 2, '1000
111010001000': 1, '0001001110100110': 4, '0111000111101011': 7, '0101111001001100':
4, '1000011000010100': 6, '0000111000000010': 1, '0000011000101100': 12, '1111110001
010101': 9, '1101101000010001': 3, '1111100010110111': 4, '1010000001101100': 13, '0
101101111010011': 5, '1111100101111110': 2, '1010100111000100': 6, '000111100111010
0': 2, '1010000100010010': 1, '1111100100010011': 4, '1101101111010101': 3, '0100111
001010101': 3, '0000001100011001': 5, '0111100000001101': 7, '0010110001111110': 5,
'1101111011111111': 6, '0001101110011110': 5, '0000011011111010': 24, '0000111111000
010': 3, '0010100110101000': 1, '1000101010001001': 2, '0111100100000000': 19, '0111
010010111110': 21, '0001011001011000': 1, '1101001000000000': 2, '1101111001100101':
3, '0111100111110010': 6, '0010110100100000': 1, '1101101111000011': 2, '01010011100

10011': 18, '1111110011001101': 1, '0111101100000111': 1, '0111100000010010': 2, '0010110001000001': 27, '1010000101111100': 17, '0000100111111110': 1, '0000011000011001': 2, '0100011010010011': 1, '0110100101101100': 2, '0010001111101101': 2, '0110110101110001': 1, '1101101101010011': 4, '0001011100110111': 1, '1010100101000000': 27, '1111010110001110': 5, '1110100101110101': 2, '1111010011110010': 8, '0111110010010011': 19, '0111010101010101': 3, '0010101101010001': 2, '0111110010100111': 19, '0101101101011101': 6, '0101000100011111': 1, '1111100010110010': 6, '1101101000010100': 8, '1001010010110111': 1, '0101101010111011': 6, '0000101111011011': 33, '1100111010001111': 1, '0000001101011000': 28, '1000111011000010': 12, '0100101111111011': 4, '1110100111001110': 2, '0111010110101110': 1, '0010000000000000': 2, '1110110010010110': 2, '1101001011001111': 2, '0111010001110101': 12, '0011110100100100': 1, '1101111110001010': 11, '1000011000111101': 3, '1001111000100111': 1, '0101011001010001': 12, '1000011110100111': 5, '0010000110100001': 2, '0111010000001101': 26, '1011110111010011': 1, '0111000111010101': 1, '1010000101010000': 21, '0010010011000110': 19, '0101101101101111': 1, '0010110011011101': 6, '1100101011011010': 2, '0000111011000110': 23, '1000011011110000': 8, '0111100010011111': 3, '1101101011001111': 1, '0101001010011101': 1, '0111100101110111': 2, '1001001100010101': 3, '0010000000011100': 1, '0111110000110110': 12, '1101011011011100': 2, '0010000111101100': 4, '0011111000010100': 1, '0000001100101100': 5, '0010100100111111': 2, '0000001000100110': 1, '0000011001101011': 10, '1011000100011000': 4, '1010110011010101': 7, '1101011000101000': 23, '0010000001101000': 8, '1010000011001111': 10, '1111100101001001': 5, '1010000000100111': 1, '0101011100100000': 8, '0010000001000000': 9, '1010110110100011': 4, '0111110110010101': 2, '1101101111000100': 1, '0111100111110101': 2, '1001101100001011': 1, '1000011011010001': 4, '0011010110111010': 1, '1111001111000011': 1, '0010010010001110': 6, '1111110010010001': 6, '0110000010011011': 1, '1000001011010101': 2, '0111000000001011': 2, '0111000111000110': 8, '1010100110110011': 3, '0000011100100110': 3, '0001001010111011': 1, '1100001101101110': 2, '0111001100010000': 2, '1011000110011110': 1, '1111000001111000': 3, '1010110101110001': 4, '1000101111101011': 20, '1101001000000101': 4, '0101101110001111': 21, '0111111100100001': 1, '0110010001100100': 3, '0101011100101011': 4, '0100101111100101': 1, '0000101001101001': 6, '0000111111110101': 1, '0111110110111101': 1, '0010000101000000': 22, '0011000010010100 1': 2, '1101111010101010': 19, '0010110001101101': 20, '0111100000111100': 7, '0001111010101110': 4, '1010100101011110': 7, '1000101010011011': 3, '0101001001101100': 3, '0000001010001010': 2, '1101011010110001': 7, '1101001110111010': 25, '0010000000101100': 3, '0101011010011110': 31, '0011100100011101': 1, '0101101010111001': 2, '0000101111011001': 8, '1010110110011001': 1, '1101111010001000': 5, '1101111000101010': 2, '0010100111010001': 8, '1100011011110010': 1, '1101101010001111': 5, '0000001001000101': 7, '1101011000000111': 7, '0000001001001001': 7, '1111100010010010': 4, '1111010001000101': 4, '1000011000110101': 4, '0101111001000000': 4, '0110000111101111': 4, '0010100001010111': 1, '0101001110110000': 3, '0010010101100011': 1, '1101001110101011': 18, '1010000101001000': 22, '1010000001000001': 3, '1001011110101011': 2, '0010100011000110': 3, '0111000000111001': 3, '1101001001100101': 1, '1110000010000010': 1, '0111000100010110': 5, '1001111000011110': 2, '1101001010110000': 1, '0010000111101000': 8, '0010000111110111': 25, '0111100110000110': 14, '0010000000110101 1': 2, '1101111110100000': 1, '0010000001011101': 5, '0010000111011110': 22, '1101101100000100': 24, '0101111010110001': 6, '0000001011001101': 1, '1111100011000110': 2, '1101101000000100': 5, '0000101001100000': 6, '1000001101010101': 10, '1101011000001100': 21, '0010100111111000': 8, '0000101010000111': 1, '0010000010100001': 1, '1111000100000011': 6, '0111000100010001': 25, '1100011010011011': 1, '1101001001100010': 1, '1010110010011010': 1, '1000111000011000': 2, '1111100000111001': 5, '1100111011011111': 1, '0010010101110000': 7, '1111010100010001': 3, '0010000111100101': 5, '1100001011101010': 2, '0000011010101111': 13, '1101111010000000': 9, '0000101111001011': 16, '0101011110110101': 1, '0000011001011101': 19, '0101000110110011': 1, '1010000101011111': 4, '0111100101111011': 4, '0111100011000111': 1, '1100011000110001': 1, '0010110011110000': 8, '1110010011110010': 2, '1101011001111101': 6, '1011000110111111': 3, '0101111101011000': 5, '1101111000100010': 3, '0010100111011011': 16, '11

00011001110111': 1, '0100001011000110': 2, '1110100011010010': 1, '111101000000000
1': 24, '1101111100100011': 1, '1000011001010110': 5, '0110000001110000': 2, '000001
1010000111': 7, '1101111010000110': 24, '1100111001011000': 5, '1010110001111111':
4, '0100111100010010': 1, '0010000111100011': 26, '1101111110100010': 5, '1000011101
010001': 8, '1101000100011000': 1, '1001001110111001': 1, '1010100111101011': 19, '0
111000111111110': 7, '1101101111111100': 2, '0001001000100100': 1, '111110001000101
1': 5, '0111010101011000': 5, '1101101010000110': 3, '1000001011100110': 10, '000010
1011010000': 1, '1000011010110111': 2, '1010100001110101': 8, '1000101011101101': 2,
'0000001001110111': 1, '1001011000000011': 1, '1111100000110001': 6, '11010010000101
11': 2, '0111000101000010': 1, '1111001110111110': 1, '1101111000011000': 19, '10101
00011101101': 2, '1111110010000000': 9, '1010010100101001': 2, '1000101111001111': 2
1, '1010100001111100': 7, '1000011010111010': 3, '0111110111110110': 1, '00001111100
01111': 1, '1100101010111101': 1, '1010000101011100': 27, '1001101110100111': 2, '01
11100111100111': 3, '0111010111110010': 2, '0101000100110100': 1, '100110111010111
0': 2, '1000111011010101': 8, '0110110101010101': 1, '0111010000000001': 24, '001000
0110101101': 1, '1010110111100000': 1, '0000101110000000': 4, '0111110000011110': 4,
'1000001011110100': 1, '1111000011100101': 1, '0101001010000101': 3, '11011010101100
11': 2, '1010110110001111': 5, '0000101111101111': 24, '0101101011001111': 1, '01010
11111001110': 2, '0111010111010000': 1, '1110100111110000': 1, '1000111011101010': 2
6, '0010100101011001': 25, '1000111010111010': 2, '1111000010001101': 1, '0101111101
100001': 1, '0100011001011100': 1, '0101001001010100': 2, '0010110111011000': 3, '10
01101100100000': 3, '0000101100100101': 2, '0101101001000101': 1, '100111101010111
1': 3, '0101111011000110': 5, '0101011010111011': 27, '0010010000110100': 5, '100001
1111110110': 6, '0000011011100000': 9, '1010100100001001': 8, '1011000010111100': 1,
'0010000011111011': 8, '1010000101001110': 5, '0111100110111010': 32, '0010110101101
100': 6, '0110100100111001': 1, '1011100110111011': 2, '1010110000011101': 2, '01000
11011100011': 3, '1010000010101011': 1, '0010010011011000': 4, '0101011100101000':
7, '0000111100010101': 2, '0100111010000011': 1, '1101101100111000': 22, '1100111011
001011': 3, '0100101011101001': 1, '1000111101000101': 9, '0000001001010000': 7, '11
01101100011111': 6, '1101001110000010': 20, '0001001100000001': 2, '110000111101001
1': 1, '0010110111111001': 3, '0100101010010100': 1, '0101111110000111': 9, '0111110
011101111': 3, '1011000111000101': 1, '1000001100111110': 1, '0101001110111001': 10,
'0011000100001100': 1, '1101101110001001': 4, '1010110000010100': 6, '10101001001001
11': 1, '1011100110110010': 1, '0101001101101110': 1, '1100111000010100': 1, '011011
1111001011': 1, '1111000100000101': 18, '1000111101011101': 9, '1101011000101010':
6, '1000001101101111': 4, '1010010111000000': 2, '1010100101001001': 25, '0010000100
110101': 4, '1010100111001010': 22, '1101001010111011': 8, '0111010011101101': 3, '1
000101111111111': 21, '0011010010000011': 2, '1101011110110111': 2, '100101101010100
0': 1, '0010100101010000': 16, '0000101010101101': 1, '0111000110110011': 16, '11010
11011001011': 2, '0010110011101111': 19, '0101101111010101': 1, '0010010011111101':
6, '1001101110101111': 2, '1000111011110000': 7, '0101101010100110': 5, '01100100010
11111': 1, '0000011000011000': 2, '0110100101101011': 2, '0101011000011010': 4, '101
1010000011110': 2, '0011010000101100': 1, '1011000100011101': 1, '1000111010100110':
8, '1010110100011000': 1, '0010110011100110': 21, '1010000001100101': 4, '0100001011
010110': 1, '1000001011111000': 1, '0111100100001101': 26, '1000101110011010': 2, '0
100001001010110': 1, '1010000011100111': 8, '0111100000010101': 4, '001011000100011
0': 9, '1011110000011000': 3, '1111010111100010': 1, '1101101111001010': 7, '1111100
000001000': 6, '0101011010011101': 9, '0001000100000000': 1, '1010000111111111': 31,
'0110110001011101': 1, '1100001111010100': 2, '1000111011101000': 6, '11110000100101
11': 6, '1000000111000010': 1, '1111010010110011': 28, '0111110001010010': 6, '01111
10110100011': 5, '1010011011100111': 1, '0000011011000111': 16, '1101101110010111':
18, '0010000111001101': 6, '1111100101001101': 9, '1111000101100010': 1, '0010110111
010011': 7, '1101001110110000': 5, '0011010110001010': 1, '1111100011101100': 1, '10
11100101011101': 3, '1101101110100001': 3, '0010100100011000': 4, '101000010110010
0': 30, '1011010010011001': 2, '0111000111100111': 4, '1010010100100101': 3, '110100
1100001111': 3, '0100001111110100': 1, '0111000100110100': 19, '1111010101110101':

5, '1010000010001000': 3, '1010000110000001': 2, '1101111100101011': 1, '00000110100
01111': 15, '1111110110011111': 10, '0000001111110000': 7, '0101001000110011': 1, '1
000101100111000': 8, '0000001100010101': 7, '0100111001011001': 2, '101000010001001
1': 1, '1101101111010100': 1, '1011100100101100': 1, '1111100100010010': 9, '1101001
100111000': 28, '1101011100011110': 1, '0111010001101100': 3, '0000001001010011': 1,
'1101011000011001': 29, '1000111101000110': 2, '1101001000010010': 2, '1000011011101
111': 29, '0100001110100111': 1, '1000011111011011': 8, '1010111001101001': 1, '0000
011010110011': 1, '1010110000000101': 6, '1010100100011000': 3, '0000001100001111':
4, '1111010001110000': 12, '1101001100101111': 6, '1100111001010000': 4, '1101111110
010010': 10, '1010100111011010': 24, '0010111111100011': 1, '0101001110001101': 11,
'1000011010011101': 1, '0000111010001011': 8, '0000111010000010': 7, '10000110100101
00': 2, '0100011111000111': 1, '0010100100101000': 7, '1000101110100110': 6, '111110
0100111110': 7, '0010110110011011': 1, '0101011011110000': 3, '0000001101111100': 2
8, '0101011110100110': 7, '0000101111111100': 4, '1101111001001000': 3, '00100101111
01100': 2, '0101001100111011': 7, '1010100011010100': 2, '0111000001100000': 2, '010
1101100011001': 17, '0100011011101011': 3, '0111100001010001': 2, '001100000000010
0': 2, '1001111010110101': 2, '0010000110100011': 8, '0110010111101010': 2, '0101011
011100111': 5, '0010000001000011': 3, '1010010001101000': 34, '0101111001101001': 2,
'0111110101110001': 3, '1011100110010101': 2, '0101011011100101': 1, '11010111000001
00': 6, '0101111010101011': 15, '1000101101010110': 5, '0110100011010110': 1, '01011
11010111101': 5, '0000001011000001': 1, '1101101000001010': 4, '1101110000100101':
1, '0010010001011101': 15, '1010100100010100': 11, '1010110000001001': 7, '000111101
1100100': 1, '1111110111010111': 3, '1101111010000010': 22, '1010110001111011': 7,
'0000011010101101': 1, '0011000010011010': 1, '0111010110111111': 11, '1000101011001
101': 1, '0010010001101000': 24, '0000001000110101': 1, '1111000111010011': 10, '010
1101010001011': 4, '1010110111001011': 7, '1000101001100000': 13, '111010010101011
0': 1, '0111110001110100': 6, '1111010011010101': 5, '1010000001110100': 11, '001110
0011100000': 1, '0000001101001100': 24, '0010100100111011': 1, '1111000111100000':
2, '1010110111000110': 7, '0101101010000110': 8, '1111010000110001': 23, '0111110011
110110': 5, '1000001100100111': 3, '0010100101010011': 2, '1000101011010010': 3, '11
11100111111011': 3, '1011110000111100': 2, '1101011101001000': 1, '0000101100101111
0': 1, '0011000000010101': 2, '1111111011111111': 1, '1001111010100110': 1, '0000011
000110100': 3, '0111010000001000': 16, '0101101100111110': 8, '1011100110111000': 2,
'0101001101111101': 5, '1000100001100101': 1, '0010110011100001': 5, '01011011110110
11': 7, '1010110010010100': 1, '0111110110011110': 10, '0011000100000011': 2, '11110
00111011111': 5, '0101011011010110': 7, '1010000111100000': 5, '0011110000101110':
1, '1110000111101101': 1, '0101011111100110': 1, '1010010100001011': 1, '11110000100
11110': 5, '0010000100001011': 1, '1111100110110000': 3, '1101101110000101': 8, '100
1101110110100': 1, '0010100101001101': 30, '0000011001000011': 3, '010001100100010
1': 4, '0101111000111001': 18, '1111000000011100': 9, '0111100111000111': 2, '001011
0101110001': 3, '0100101111010110': 1, '1000101010110011': 2, '1000111011111100': 8,
'0101101010101110': 4, '1010100101001011': 4, '1011000000011001': 1, '11100001011110
01': 2, '0111000110010001': 8, '1101011010111011': 24, '1111100010000100': 2, '11010
01100011011': 6, '1101101100100101': 16, '1001111110111110': 1, '0100111111111011':
1, '0010000110001110': 10, '1111000100100110': 6, '0010000011110111': 9, '0000111001
001011': 8, '1010110101100100': 5, '0001101110110110': 4, '0010000001101101': 7, '01
11100110000000': 6, '1010010101101010': 3, '1111000110011110': 25, '101000001100011
0': 6, '0111010111110111': 1, '1110100111010111': 2, '0111100111100010': 7, '1111100
001110100': 3, '1101001101001101': 5, '0000011011001111': 23, '0000001101101101': 2
8, '0010100100010001': 5, '1101101110101000': 6, '1111110011010010': 6, '10000010111
01110': 9, '0000101011011100': 2, '1000101011001000': 1, '0101011011011110': 5, '010
1111010011110': 28, '0011110011000111': 1, '0011100101010011': 1, '0001001110011100
0': 1, '0010000011110100': 3, '0110000010101011': 1, '1000111011000011': 18, '011101
0011011111': 6, '1000001001001101': 7, '0101100100001101': 1, '1111000111101011': 3,
'0010100100110000': 4, '1000100011111110': 1, '0101111001110000': 7, '11010111111000
11': 2, '1011110010011000': 2, '0101001110101010': 15, '0110101100101011': 5, '11111

00011011111': 2, '0001011100011100': 1, '0010000100011101': 2, '1000101100100101': 1, '0110010101101101': 2, '0011110010000011': 4, '1010110111100011': 4, '00001011100 00011': 8, '1000011110111011': 1, '1111111110100100': 1, '0111010111010111': 4, '100 0101010101001': 2, '0110110111101111': 1, '0010100001101000': 5, '0111010010100000': 7, '1000101110110010': 4, '1010100101000110': 5, '1101101101010101': 5, '00101000010 10011': 2, '0101001110110100': 9, '0010010101100111': 2, '0011100110100010': 1, '110 1001010001100': 4, '1110000100011101': 1, '0101001000000000': 4, '0010110010001010': 9, '1100011101010001': 1, '1111000101101110': 1, '0000111100010111': 1, '10110001100 10011': 2, '1100001101100011': 1, '1101001101001100': 2, '0111101100100101': 2, '011 1100001111000': 4, '0000011011001010': 21, '0001011000000101': 3, '011100000000100 1': 5, '0111000100000000': 36, '0100001111100000': 1, '0010010111001111': 6, '101011 0011100100': 6, '0111010100111101': 6, '1010010000100100': 9, '1000001111101010': 1 4, '1100001011001101': 1, '1110010010011011': 1, '0000001000101000': 2, '11010011001 11010': 9, '0000010001110100': 1, '1101011010101000': 3, '0101111100111010': 1, '010 1001100101000': 14, '1000111011000110': 23, '1000001011010111': 2, '101001010001100 0': 1, '1111110010010011': 18, '0000011011001000': 3, '0110000110000110': 1, '111100 0101001011': 2, '1010000100000011': 1, '0110100001011101': 1, '1111100100100000': 2 8, '0101001110101111': 17, '0010000110101001': 4, '1111110010100011': 22, '101010000 0101101': 2, '1101100100111001': 1, '0011000110101010': 3, '0010110101101110': 1, '1 010000101001100': 28, '1101001110101001': 6, '1111110100110101': 6, '011100010100100 1': 4, '1101111000010011': 4, '1001111000110000': 3, '1010000010001101': 3, '1101111 110011010': 5, '1101001100100101': 28, '1100111001011100': 3, '0010010110010011': 1, '1110000001101011': 1, '0111000101111111': 4, '0101011000100000': 19, '1000111000111 010': 1, '0000110001101011': 1, '0011100110011001': 1, '0111000111011011': 5, '01111 10111101000': 1, '0101111000111110': 7, '1101011110101111': 3, '1010000101011101': 1 4, '0010110101101011': 1, '1011100101110100': 3, '1010000101001101': 24, '1000001110 000010': 8, '0111010010011110': 29, '0010010011001000': 6, '1000101101001101': 24, '1001001110011010': 4, '1010000110001110': 7, '1001111000111000': 4, '00001111011110 11': 7, '0111110101101101': 1, '1000011010110001': 2, '0000001001000111': 3, '110101 1000001001': 27, '1101011110100011': 3, '0101111000110000': 27, '0000101110010010': 3, '1010110111010010': 4, '0000011111011001': 1, '1010000111010110': 19, '0110100101 001100': 4, '1010010011100100': 3, '1000001111100010': 21, '1111000100000111': 7, '1 010011011110111': 3, '0111110110110011': 5, '0000111111111011': 6, '010111101111011 0': 1, '0011110000001101': 4, '1001001000011101': 2, '1010010011110111': 17, '010011 1010100110': 1, '1111010100001100': 4, '0000111101101011': 2, '1101101100000110': 5, '0101101111000010': 8, '0001001100100001': 3, '1010110011101101': 4, '01110001110000 01': 1, '1010100110110100': 2, '1001001100011101': 2, '0000001010110110': 1, '000000 1101001010': 10, '0010110110001011': 3, '1000011001101010': 6, '1000011100100000': 1, '0101111110010111': 4, '1000011001101001': 22, '0010110100001010': 2, '0000001010 100100': 2, '1111010111111010': 1, '0101011010001001': 5, '0101000111101110': 1, '01 11000001010000': 5, '1000011000100110': 4, '1111110000101010': 3, '100000110000000 1': 8, '1001011010011000': 2, '1000001000001000': 1, '1000001011100010': 7, '0000101 011010100': 1, '1010000001110101': 6, '1010100011111011': 8, '1110000100010010': 1, '1101001010000101': 1, '0101011100011110': 1, '1000000101010011': 1, '10001111010101 00': 4, '1101011000100001': 19, '1000111001110000': 13, '1010110011111100': 3, '0000 011000011101': 5, '1111000101110001': 16, '1000001011000111': 4, '0101001100001000': 19, '0100011010000000': 1, '1110010111010100': 1, '0101001010111010': 10, '011010011 1101011': 5, '1111000101110000': 10, '0000011000011110': 1, '1010000111110100': 3, '0101011010010110': 28, '1100101011001001': 1, '0101111100111101': 7, '1111000010101 001': 2, '0000111101000001': 8, '0101011110010010': 5, '1100101101000010': 1, '10000 01101001111': 7, '1110110111011111': 2, '0001001100110100': 3, '0010100111000000': 6, '0100101101111001': 3, '1011100110010010': 1, '1010110000111101': 8, '10101001000 01100': 8, '1000111010111011': 3, '0100011011110000': 1, '0010010011101001': 1, '110 1001101010100': 9, '0100101101110011': 1, '0101101011111010': 2, '0110000011000110': 1, '110011101111110111': 1, '0100011001101110': 1, '1111100111101111': 2, '11000110111 10100': 1, '1111110110101000': 2, '0010010011110100': 6, '1011010010111111': 2, '010

0101101000000': 7, '1100101111110111': 2, '0111010100101101': 6, '1110100100001101':
1, '0010010100001110': 1, '1010110111100111': 10, '0000101110000111': 5, '1010110111
010001': 1, '1011100111101111': 1, '1001111000010100': 1, '0011000010100111': 1, '11
01111100011010': 1, '1101011100110110': 1, '0110010010000110': 1, '000000110011100
0': 10, '1111100000110000': 10, '0010100101101111': 8, '1001011000000010': 1, '00000
01001110110': 1, '1000101011101110': 3, '1101011000011111': 9, '1111111011110100':
1, '1001101100100010': 1, '1001111010101101': 2, '1000010011011110': 1, '01000111010
11001': 1, '0101111010010000': 4, '0101011011010000': 1, '0010010010001111': 4, '100
0111000011011': 2, '1000011011010010': 30, '0001011011101110': 1, '000100110010100
1': 2, '0010010100000100': 4, '1010100101110000': 22, '0011000101100101': 1, '111010
0101111100': 2, '0111110010011110': 30, '0110010101011100': 3, '1111010011111101':
2, '0111100111011011': 4, '1111110001011000': 5, '0101101011110100': 1, '10001110111
00010': 23, '1100111011111011': 3, '0100011001100000': 2, '1111110111010010': 1, '00
01111011100001': 1, '1010111011000011': 2, '1010010001000001': 21, '010001101100101
0': 4, '0001101110001100': 1, '1011110110100011': 1, '1111000010110110': 10, '100111
1001110000': 1, '0101011010000010': 21, '1101001001100100': 2, '0111000000111000':
5, '0111000100010111': 3, '0100001111010111': 4, '1101011110110110': 1, '01110100111
01110': 5, '0011010010000010': 3, '1001011010101001': 1, '1101111010110100': 10, '00
10110000110111': 4, '0111010000101111': 5, '0000111110100010': 2, '100000111111010
0': 6, '0111100110010110': 23, '0110100111011110': 1, '0000011111100000': 2, '010111
1110111001': 1, '0010000100101100': 3, '0101111010100011': 19, '0111110010111001':
5, '0110000001101001': 1, '1101111100010100': 6, '1000111001101100': 12, '0101101000
011110': 2, '0000101101111110': 5, '1000011011000011': 18, '0011000010110110': 1, '1
111110011011111': 6, '0110110111011100': 1, '0101011001110101': 7, '110100111101011
1': 9, '0000001111110111': 15, '1000111011110110': 16, '1000101010111111': 2, '11011
01101010100': 6, '1111100101101101': 4, '0101011011100011': 6, '1001001111101111':
1, '0010100001111100': 6, '1000001100010100': 7, '0000101000101001': 3, '10110001101
01101': 1, '1101011010001111': 31, '1000111100111100': 1, '1000011000010101': 2, '00
00111000000011': 1, '1101111101101000': 1, '0101101100001001': 18, '011010011100101
1': 1, '1101111100010101': 9, '0110000001101000': 1, '1000011111001111': 6, '1000001
101100100': 22, '1010010111001011': 6, '1001101011111010': 1, '0111000001110101': 1,
'0001101101010111': 1, '1010100011100001': 3, '1111000101110111': 2, '01101001011010
00': 1, '0010100101101000': 24, '0000111101111100': 10, '0101101101000101': 3, '0010
010010101110': 17, '0101101011111110': 2, '1000111011101100': 9, '0110000011000010':
1, '1011010000111110': 2, '0010110111000111': 6, '1111010010100101': 8, '11010010001
01101': 7, '0111110001000110': 1, '0010100111110001': 7, '1101111000001010': 6, '000
0001001001101': 9, '0101101100111111': 7, '0001011101010101': 1, '1011110100100101':
1, '1010010011000111': 23, '1111000101010000': 3, '0110010001110111': 1, '1000011010
001111': 7, '0000111100000100': 2, '0001111110101011': 1, '1000001110101100': 6, '01
11010000010001': 19, '1010010100000101': 1, '1111000010010010': 9, '100101101001110
1': 1, '1011100010010011': 1, '1010010101000100': 9, '0010000011110010': 7, '0000111
100101000': 1, '1111010101001001': 1, '0011100101010101': 1, '0001001110011110': 4,
'0111000111001011': 5, '1101011100111110': 3, '0110010010001110': 2, '11000011011001
11': 1, '0000011100101101': 2, '0010001000010100': 1, '1010010010001000': 1, '101100
0110010111': 3, '1111110100001100': 7, '0011000111100010': 1, '0111110010101110': 2
9, '0100001101010000': 8, '0000101101111001': 22, '0101101000011001': 7, '1111000000
001100': 4, '0011000110110011': 4, '1101001010011001': 1, '1101111110000010': 9, '01
01011001011011': 2, '1100111001000100': 1, '1001111000101101': 2, '001001010001011
1': 1, '1011010000111101': 2, '0010100111101111': 18, '1101100000101001': 1, '110000
1101001110': 1, '0101111011010001': 2, '0101111100111100': 6, '0010010000111010': 5,
'1000011111111100': 1, '1010000100001101': 5, '1111110000010110': 7, '01010010001001
00': 4, '1111110001001111': 1, '1000101101001001': 11, '1000001010101011': 4, '10000
01101101011': 4, '1111000100000001': 24, '1111110000100011': 4, '1000011000101101':
3, '1111110000011001': 16, '1100111011011010': 4, '1101111100001101': 5, '0110000001
011100': 2, '0110100001110101': 1, '1111000100100111': 3, '1100001100011011': 1, '10
00111111101111': 6, '0110100011001101': 1, '0001101110101011': 1, '010100101000111

1': 5, '1000101001011000': 6, '0110010001111100': 1, '1111000101011101': 4, '1000011010000010': 13, '0101001110100100': 7, '0000101100010101': 10, '0101101001110101': 2, '1000001110010101': 2, '1000001100101010': 2, '1101011101110001': 3, '0011100010011110': 2, '1111010100111110': 1, '0000111011110110': 26, '1001001100110001': 1, '0111110000100100': 22, '0111100100010111': 5, '0010110110100101': 1, '0000100010110010 1': 2, '0010110000101100': 3, '1000101101010000': 16, '1010010011100000': 7, '0101101110000010': 21, '1001111001011001': 3, '0010110011110111': 22, '0101001001010111': 3, '1010000111110010': 20, '0001000100001101': 1, '1011110010101011': 6, '1111100110001100': 8, '1011010101010100': 1, '0000001110001110': 6, '0010000011101110': 9, '0111110101111000': 2, '1110100111110100': 1, '0111010111010100': 1, '0101011111001010': 3, '1111000000101011': 2, '0111000010011111': 3, '1101111100111100': 9, '1010010011101001': 4, '1111100001010010': 1, '0010100101101110': 5, '1000101011101111': 7, '0010110100111100': 2, '1101011000010100': 18, '0010011011000110': 2, '1000011010001001': 5, '0101101111000111': 7, '0000101111101000': 8, '0010000001101010': 3, '0111100110000101': 6, '0100001110100100': 1, '1000011011101110': 15, '1110110011001011': 6, '0000011001101010': 6, '0101111101011001': 4, '1101001010001001': 1, '0010000110000011': 7, '0110000111010001': 1, '1010100010001001': 1, '0000010011000001': 1, '1000011001001101': 28, '1010000001011000': 8, '0001001000101100': 1, '1010000100110111': 3, '0010110110111000': 1, '1111000000101101': 1, '0110000011010010': 2, '1100101100101001': 1, '1000011110101011': 3, '1111000000100001': 5, '1111100101110011': 3, '1010001101101001': 1, '1100101111000001': 2, '0111110000101101': 21, '0010110110101110': 1, '0101111010110011': 29, '0000001011001111': 6, '0110100011011010': 1, '1101101000000110': 2, '0111110000011101': 24, '1000001011110101': 5, '0101100110110101': 1, '0010100110101010': 13, '0100101111101111': 3, '0101011100100001': 8, '1010000000100110': 1, '1111100101001000': 2, '0000001110110111': 3, '0010100111000010': 20, '1101111001011011': 1, '0111010001110000': 8, '1101001111100111': 5, '0111110110001011': 4, '1010110011100000': 3, '1010110011000101': 3, '0111010111001010': 1, '0100111111010011': 1, '0111100010001101': 2, '0101111110011101': 3, '1000011100101100': 2, '1000111110100011': 3, '0010100011100011': 3, '1001001100100001': 2, '1000101110010110': 4, '0111100100000011': 16, '0000011000010101': 4, '1000101110110111': 5, '0111010010100101': 7, '0000111101000110': 2, '0101011110010101': 2, '1001111100000011': 1, '1110100100000001': 1, '0111010100100001': 7, '1111100011010101': 1, '1001110100000010': 1, '1101111100100101': 9, '1000011001010000': 16, '1000111010001100': 2, '1011010010010111': 6, '1011100001000000': 1, '0000011100101001': 2, '1010010010001110': 10, '1111100011101110': 3, '0000001011111100': 2, '1010000110110101': 3, '0010100111000100': 9, '1101111001011101': 6, '0101001001110010': 1, '1101001001011100': 3, '1111000111101010': 1, '0010100100110011': 2, '0000001000101100': 4, '1101001110111101': 10, '1100011010010110': 1, '0111000100011110': 13, '1111010110001111': 4, '0010010100010001': 7, '1010100101000011': 9, '1000011101100110': 2, '0000111001110001': 12, '1100001111100001': 1, '1101111000111000': 25, '0111101111010011': 1, '1100011010110001': 1, '1101011000010001': 13, '1001001100010000': 2, '0111100101110010': 2, '1001101110100010': 3, '1101101010000010': 11, '0000011001110010': 3, '0111010010011101': 10, '0010010011001001': 3, '1110110001111100': 1, '1110000100001000': 2, '1010010111100011': 5, '1010110010111101': 1, '1101011001010111': 1, '1000111100000000': 1, '0000001001111100': 6, '0010110100110101': 3, '1000101011100000': 1, '0010100101100011': 4, '1010010000000101': 7, '0110010011000001': 1, '0101011010100100': 5, '1011100100111000': 3, '1101111111011010': 1, '0110110001101000': 1, '1101011010010010': 21, '0101101100100101': 17, '0111110100111100': 2, '0101111010110100': 7, '0000001011001010': 3, '0110100011011111': 1, '1101101000000001': 6, '1101001011101010': 1, '1010110010111011': 3, '1010010111100101': 1, '1101011001010001': 5, '0010100001000110': 2, '1011100110000110': 2, '1101011011010011': 7, '0111110000111111': 3, '0111100101101100': 1, '0101111010110111': 25, '0000001011001011': 2, '0110100011011110': 2, '1101101000000010': 1, '0001101100011011': 1, '0001011000111101': 3, '0111110110101111': 8, '0101011000000101': 37, '0101011010010101': 5, '1100111011100110': 6, '0111000011011101': 2, '1101011001011000': 8, '1110010000010001': 1, '0010101101110000': 1, '0111010000011100': 26, '0101111110000010': 7, '0101011010010010': 34, '101001001

1001011': 21, '0000111101111001': 3, '0101011110000100': 1, '0111101110011011': 1, '1000001000000000': 3, '1000001100001001': 7, '1001011010010000': 2, '11010111001010 10': 2, '1100001011001011': 1, '0101111111110111': 3, '0010010101101000': 5, '111101 0000101110': 6, '1101011001100001': 2, '0111110011101101': 1, '0101101111001110': 8, '1111010001010101': 15, '0000101000010100': 1, '1100101100110000': 1, '01010110100011 011': 29, '0101001110011111': 31, '1111110011000001': 3, '1000101011110001': 4, '111 0100111100111': 1, '1001011001011101': 2, '0111000110010110': 17, '0000001101011101 0': 5, '1010100110101110': 8, '0101011011011010': 3, '1001001010110011': 1, '1010010 000111011': 2, '0101111010011010': 24, '0001001010011010': 1, '0000111011100111': 2 3, '0010010000011001': 3, '0000011111100110': 13, '0111000110011000': 5, '1110100011 111111': 1, '1110000101110000': 2, '0000001010101001': 3, '0000100000000000': 1, '10 10000101101110': 5, '1011100101010101': 2, '0101001001100110': 1, '100010101001011 1': 1, '0010010001010001': 25, '1000111001000101': 35, '1000011010101110': 9, '10101 11101010101': 1, '0011100000100000': 2, '1000011001101110': 8, '0000110011110110': 1, '0000111000111100': 2, '1110010011010110': 3, '0010010011110001': 5, '00111101000 01101': 2, '1111010011010010': 9, '1110100101010001': 1, '0111110001110011': 1, '101 0000001001000': 2, '0111100110110101': 5, '0010110101100111': 2, '1010000101000001': 30, '0100001101000000': 1, '0111110100011001': 5, '1010110111100001': 1, '0000101110 000001': 4, '1001101101000100': 1, '0111010011011010': 4, '1111100001110101': 2, '11 11100100011001': 27, '1111100010011000': 1, '1011000110101010': 4, '110101101000110 0': 2, '0010100001111111': 1, '1000001100010001': 5, '1111100100110100': 22, '001011 0110010011': 1, '0101011011111010': 4, '0001011010000110': 4, '0101101010000010': 5, '1010110111000010': 12, '0110110001011011': 2, '1000111000101001': 7, '0101011011001 111': 2, '0010100111000110': 22, '0101001001110000': 3, '1101001001011010': 1, '0010 100111001111': 22, '1101111001010110': 3, '1101001001010001': 2, '0010110101111101': 11, '0111100111001011': 5, '1111000000010110': 2, '1011010100010100': 1, '1110110001 011100': 4, '0010000001110010': 1, '0011100110110011': 2, '0101001111010110': 9, '10 10000111000000': 4, '0111010000110010': 6, '1010100001101100': 3, '101010011100100 1': 11, '1111100001001011': 3, '0000001100000001': 2, '0100111001000101': 3, '000010 0111000010': 1, '0010110101000010': 2, '1111100100000111': 7, '0000101001111111': 2, '1010110011011011': 19, '1010110011001111': 18, '0010000110110110': 4, '111011010111 0011': 1, '1111010011110001': 1, '1101101010001000': 2, '0111110010010000': 6, '1000 101000000100': 1, '0111010101010110': 1, '0010000011010111': 4, '0000001110010111': 2, '1010100000011010': 1, '0000111010101110': 9, '1101101000101101': 7, '01110000010 00110': 1, '1000011000110100': 5, '1101111110000001': 2, '0000011011000010': 25, '10 10100010100011': 1, '0000111000010111': 1, '1000011100000100': 2, '001000001110111 1': 5, '0000001110001111': 8, '1010110001101101': 21, '1010100100111010': 2, '110111 1011100000': 3, '0011000110000110': 2, '0101101010100011': 8, '1000111011110101': 4, '0111010001010000': 9, '1101101101100110': 2, '1101001000100001': 4, '01111100010011 00': 8, '0010110111001011': 4, '1101111000000100': 19, '0010100111111101': 5, '01110 00101010010': 2, '0000101101000010': 5, '0111110100010100': 4, '0101101000100010': 1, '0111100100001111': 2, '1001001100101101': 2, '0111000101110111': 1, '11010010000 01000': 9, '1000111010000111': 5, '1010100010010010': 1, '0111000011100101': 1, '011 1010010101110': 19, '1010100001000011': 2, '0010010101011101': 3, '010100111100111 0': 1, '0000111111111000': 2, '1110000111010000': 2, '0011000100100100': 4, '1110100 111010110': 1, '0111010111110110': 3, '0111100111100011': 5, '1010110101110010': 3, '0000100011101010': 3, '0000001101010010': 6, '1111000000111001': 11, '1101011100110 100': 4, '1100001011010101': 1, '0110000011000111': 1, '1000111011101111': 23, '0100 011001101101': 4, '1101111100101101': 6, '1000011001011010': 1, '0010011111111100': 1, '1101101010110010': 8, '0101001010000100': 4, '0010000000101001': 2, '11111000010 10011': 1, '0101011011101100': 2, '1111100101100100': 5, '0100101001000001': 1, '100 1011110111111': 1, '0000001011100111': 7, '1000011101111011': 2, '1000111111010010': 3, '0000011101001010': 1, '1101001010010111': 6, '1000011000111001': 6, '01010011111 10011': 4, '1100111111101110': 1, '0111000110111000': 9, '1010100110100111': 8, '010 0001101111000': 2, '1101111110001001': 1, '1101001010010010': 6, '0101111000100111': 3, '0011110011011110': 2, '1001111100010000': 2, '0101011110000010': 6, '101001001 10

01101': 4, '0010100010100111': 2, '1000011101001001': 5, '0101001110010101': 9, '111
1110011001011': 4, '1000001001100100': 4, '0010100000101010': 2, '1111011010010010':
1, '1100101111100001': 2, '1111000110101110': 20, '1000111000101100': 7, '1111010001
010100': 10, '1101101110110010': 23, '0111100110100101': 7, '1010000101110001': 14,
'1100011111000110': 1, '0011010010111011': 1, '0000011001111000': 14, '1110000100101
010': 1, '1001101111000001': 1, '1101111010011100': 3, '0000101010111110': 1, '10001
01100101000': 11, '0010000000100001': 2, '0101111011101111': 5, '1001101100010001':
2, '0101101010010110': 6, '1010110110110110': 2, '1010000111000110': 23, '1101000100
001000': 1, '0100101111111111': 4, '1110100111001010': 3, '0111010110101010': 4, '10
10000111010000': 5, '1010110010100011': 7, '0110111001011101': 1, '0010101111101001
0': 1, '0010000001110001': 5, '1101011000100011': 5, '0110110000011001': 1, '0101001
101010001': 6, '0111101110001001': 1, '1111000010010101': 2, '0010101101111110': 1,
'0111010000010110': 9, '1101001010110100': 4, '1111010100011000': 5, '00110000101010
11': 1, '1010010010000110': 6, '1011000110011001': 1, '0111010000011011': 8, '100000
1110100000': 2, '1101101010100111': 3, '0101111000011000': 27, '0011110101001100':
1, '1101001011100011': 1, '1110100110001001': 1, '1110000101011011': 1, '00111100101
11100': 1, '1011010011011110': 1, '0100010101001111': 1, '1001001110010010': 2, '100
0101101000111': 6, '1111110001111000': 8, '0111000100100111': 11, '001010001111111
1': 8, '1111010110010000': 6, '0011100000110000': 1, '1000001000011111': 1, '1101001
010011011': 12, '0101011001011001': 6, '1011000100100000': 3, '0011010000111001': 4,
'0011010000100101': 3, '0100111011010000': 2, '1111010010011000': 8, '001100000011110
10': 1, '1101101101010000': 12, '0100001100011000': 1, '0010110010110011': 5, '10111
00010110110': 1, '0101101110110101': 9, '0000101100010001': 9, '0101101001110001':
4, '1010100101101101': 20, '1101011111101000': 3, '1010010001010100': 22, '000111100
0011100': 4, '1000001110000001': 3, '0000101010010010': 1, '1101000010000110': 1, '0
010100101011111': 4, '0000101010100010': 1, '1111100111110111': 5, '001000010110011
1': 4, '0011110001110101': 3, '0111000110000000': 14, '0010110000010100': 4, '011101
0010010000': 7, '0111100000100101': 11, '1010000001000010': 3, '1101001110101010': 2
4, '0111110110110110': 5, '0010000101001011': 6, '0011000100101100': 1, '00111100000
11101': 2, '0000011101011101': 2, '0000111010011111': 2, '1000011110001110': 1, '001
0000000111011': 1, '0011100110111100': 1, '1111110000010111': 5, '0101011111010111':
1, '0000011111010010': 5, '1001101110011110': 1, '0010010000100111': 2, '11011110010
11001': 3, '1111000011100110': 2, '1000001001000100': 6, '1111000111100010': 4, '010
1100100000100': 1, '1000101100101100': 7, '0011011100001001': 1, '1100001101001000':
1, '1101100000101101': 1, '0100101001110100': 2, '1011110100101101': 1, '00101000101
00101': 1, '1010010011001111': 20, '1000001111110111': 16, '1110000111001001': 2, '0
111010000101110': 5, '1001101110000000': 1, '1000111010010011': 3, '111010010011111
1': 1, '0111010100011111': 2, '0111110000010110': 5, '1001001100101001': 2, '1000101
010000010': 2, '0010100110100011': 9, '1110110111101010': 3, '0000101001101101': 1,
'0100001110000010': 1, '1000001101011010': 2, '0101111011100111': 5, '001000000010001
11': 2, '1101011111111000': 1, '1101011011101010': 4, '1010000100001000': 7, '000000
1101100001': 28, '1101101011000100': 1, '0101001010010110': 5, '1111000000000101':
6, '1101010010110010': 1, '0101101110110001': 11, '1101001111101101': 1, '1000111000
001001': 4, '1100101110001100': 1, '1001101100111000': 1, '0111110110000001': 1, '01
01001110000100': 1, '1000011101011000': 7, '0101111100011110': 3, '011000111101000
0': 1, '0101101110001101': 6, '1010110010111110': 2, '1010010111100010': 8, '1101011
001010110': 2, '0001101100101100': 3, '1110000001011101': 2, '1001001100000100': 2,
'0000111111110110': 5, '0010000101000011': 6, '1101111100101110': 2, '00000110100010
10': 9, '1001011010011001': 1, '1000001100000000': 3, '0000101000010011': 1, '100000
1000001001': 2, '1111010001010010': 2, '0111010001100000': 5, '1101101100010110': 5,
'1000111101001110': 2, '1010000100101101': 5, '0000111011101001': 6, '11011111001011
00': 7, '1000011001011111': 7, '1010000110010010': 1, '1111100110010011': 23, '00001
01111111001': 8, '1101111001001011': 2, '1010100011111111': 7, '1010110111101001':
1, '0000101110001001': 2, '1000011001100011': 8, '0000111000110101': 3, '10101000110
00001': 1, '0111000110010100': 3, '1010100100010000': 4, '1101110010100011': 1, '010
1011111010110': 4, '0010000000001000': 2, '1111100010111110': 7, '1101101000011100':

4, '1000101101011000': 27, '1100011001001010': 1, '0110000101000000': 2, '0101111100100100': 2, '1101001010111110': 6, '0011110100110101': 2, '1000111011011101': 5, '0110000101101000': 3, '0101111100000100': 4, '0010000110100101': 3, '1000101101000011': 9, '1001001110010110': 3, '1000001011100100': 3, '0000101011010010': 5, '1101111010111101': 2, '1011110010010000': 1, '1111100100001001': 19, '00000110101000001': 4, '1010110001110111': 2, '00000011111011111': 5, '1001101110010001': 1, '0010010000101100': 10, '0111010110101000': 2, '1101011111010010': 1, '1101001110001011': 15, '0100011101100100': 1, '1110010111011011': 1, '1101111001000001': 6, '0100111011101111': 2, '1101101101001111': 1, '1111000111000010': 3, '0010101101001001': 1, '1011110100100100': 1, '0010100010101110': 2, '0100101001111101': 4, '1010010011000110': 18, '1011010100001000': 1, '0111100011101110': 3, '1011010000000001': 1, '0011110010011000': 1, '1010110001100111': 6, '0100101101100001': 3, '1010100011001101': 2, '1111110011101000': 2, '1000011001101111': 3, '0101111000101010': 2, '0011110011010011': 1, '1010000110100100': 2, '1111100110100101': 6, '0110100101111100': 2, '0010100011001110': 6, '1000011101000101': 5, '0101001110011001': 8, '0000111001010110': 7, '1011110001001000': 1, '1110010010001111': 2, '1010000011001101': 1, '0111110110011100': 2, '1010110110101110': 1, '0111000001000001': 1, '1101111110000110': 7, '1000011000110011': 1, '0101111001110010': 6, '1111010110101110': 7, '0101101100110000': 20, '0011110000001000': 1, '0111010110011010': 9, '0011000101010101': 2, '0010000001101110': 1, '0111100110000001': 5, '1111100110011001': 6, '1111010101100100': 1, '1010000110011000': 1, '0000001101100010': 9, '1111000001001100': 1, '1111100100101000': 27, '1101011010000010': 18, '1110000100111010': 1, '1011010010111011': 2, '0100101101000100': 4, '0000011001101111': 6, '0000011000001000': 6, '0100011010000110': 2, '0000011100000001': 1, '0101011001101001': 4, '0000011000100100': 4, '0111010000110011': 6, '0001111100010001': 3, '1010100001101011': 1, '0101001101101001': 1, '0111111001110110': 6, '1101011001100100': 3, '1000111100011001': 1, '0000111010011011': 1, '1000011110001010': 4, '1010000110111011': 2, '0000001011110100': 4, '1111100110000110': 21, '1011110010100111': 4, '1000111111110011': 8, '0101011110001111': 7, '1001111000110001': 5, '1010000010001110': 2, '0010110001001000': 27, '0010100101001001': 20, '0100011111100010': 1, '0001101110001000': 1, '1101001110000110': 26, '1101011111011111': 3, '0111110110010011': 5, '1001101100001000': 1, '0000101011000011': 8, '0110010101110111': 1, '0010100011110100': 2, '1010010011101010': 19, '1111010100110010': 1, '0011100010010010': 1, '0000001110011010': 1, '0010000011011010': 6, '1010010011110110': 24, '1000011110100011': 2, '0110001011111110': 2, '0010110001001011': 5, '0111100000011010': 3, '0100101111010010': 1, '1000101010110111': 1, '0101101010101010': 6, '0010011110101011': 1, '0110100101100101': 2, '0110010001010001': 2, '0000111010011101': 1, '0000011101011111': 1, '0001011010100010': 3, '0111000010100110': 3, '0100111111001111': 1, '1010000111100100': 8, '0010000000011000': 1, '0101011111100010': 1, '1001101110011010': 5, '0000011111010110': 10, '0010010000100011': 3, '1010110101111101': 9, '1011100100000101': 3, '0011010000001100': 5, '0011000000010000': 2, '0011010000111000': 3, '0010110011101010': 22, '0101101111010010': 5, '0010110011111010': 23, '1101011011101000': 2, '1111010001101110': 1, '1010010011010010': 26, '0000101001111100': 9, '1111100100000010': 5, '0010110101000111': 3, '1101101111100000': 1, '0000001100000100': 9, '0100111001000000': 2, '1101011010000011': 27, '0011000000011100': 1, '0000101100100011': 3, '0001111110000110': 1, '0010000001100111': 3, '0111100110001100': 7, '0100111111011011': 1, '0011110000111100': 4, '0000111111011101': 3, '0111110001001000': 1, '0010110111001001': 2, '0000011001010111': 9, '0101011110111111': 7, '0000101111000001': 4, '1111010100011100': 2, '1101001101011010': 2, '1010010000010101': 6, '0100011011111110': 2, '0001001100111001': 3, '0000000100100111': 2, '1100101111101010': 3, '1111000110100101': 5, '1101111100110000': 4, '0110000000000101': 1, '0111000010010101': 2, '0000011010010100': 3, '0010001101100001': 1, '0010100111001000': 6, '0100101101110001': 3, '0000101100100100': 4, '1001101100100001': 2, '0111110011011010': 6, '1111010000011011': 9, '1111100000001101': 7, '1111100011001011': 2, '0000001011000000': 3, '0101111010111110': 34, '0000001001011011': 1, '1101101100010100': 26, '0000011000111110': 2, '0100011001111100': 1, '0110100011101001': 1, '1101111011000100': 1, '0010110000000001': 7, '1000101110001011': 11, '1

101011001110000': 11, '1110010001111001': 3, '1011000110110010': 4, '100111111000001
0': 1, '0010000110110010': 6, '1111101110100010': 1, '0111010110001010': 7, '1010100
101110011': 5, '1111110100010001': 7, '1110000101011110': 2, '1001101111010101': 2,
'1010110101010000': 3, '1001001101010001': 1, '1000101000011000': 1, '01110101010001
10': 1, '1111010011100111': 8, '0111110010000100': 4, '1010000111111001': 10, '11011
01010110110': 5, '0101111000010001': 21, '0110010101101001': 1, '1010010010001010':
2, '1111000111110010': 6, '1001001100010100': 1, '0111100101110110': 4, '01010010100
11110': 8, '1101101100110110': 9, '1101011000111011': 8, '0111110010110001': 4, '110
1101010010100': 2, '1001001101011001': 3, '1000101000010000': 1, '0110110011111010':
3, '1011110010001010': 3, '0111000100001110': 6, '1010010100010100': 2, '11110000000
00001': 6, '1001101111100101': 1, '0000001011101001': 2, '0000111010001010': 6, '000
0011010010101': 2, '0111000010010100': 1, '0010000000110101': 1, '1101101011001011':
3, '1001001100010001': 1, '0111100101110011': 1, '0111100100011111': 7, '01111100001
01110': 3, '1101011000011010': 11, '0111010000110110': 10, '0000111000001011': 1, '1
000011000011101': 1, '1000101100011000': 2, '1000101100010101': 7, '100111110000100
1': 1, '1001001111110010': 1, '1111100110010000': 4, '1001001000111001': 1, '0111100
101110100': 3, '1110000111101000': 1, '0011110000101001': 3, '1001011100101011': 1,
'0111000111100011': 4, '1010110100110111': 1, '1111111000100100': 1, '10000011011000
01': 21, '1111110111111011': 1, '0000101111010001': 5, '1100001011000101': 1, '11010
11100100110': 4, '0110010010010110': 1, '0010100100111001': 4, '0111000110011001':
4, '1101111100110100': 5, '0110000000000001': 1, '0000011010010000': 3, '01110000100
10001': 1, '1011100110110111': 2, '0001011101011001': 1, '1010100100100010': 1, '101
0110000010001': 8, '0001001001101101': 1, '1000011010000001': 4, '1010010011000100':
9, '1011010110011010': 1, '1010100111111010': 24, '0001001111000000': 1, '1111000010
101101': 2, '0101111100111001': 5, '0100101000001000': 2, '0001101000111111': 1, '01
01111001001011': 1, '0101011010111001': 6, '0010000111000100': 7, '011100010010000
1': 32, '0010000100100000': 5, '1000101101010100': 16, '0010000011000111': 6, '10001
00101100011': 1, '1000111100101101': 1, '0010100001101101': 4, '0011100110010111':
3, '0100101111010101': 1, '0101101010101111': 6, '0111011000011001': 1, '01010110101
00011': 17, '1101011100011001': 9, '1111100100011111': 4, '1011100100100111': 2, '00
00101110010100': 1, '1010110111010100': 2, '1101111110110111': 11, '110000101101111
0': 1, '1101011100111101': 6, '0101011010000000': 8, '1010100011111010': 9, '1111000
011010010': 2, '1111110000010101': 25, '0000011001111011': 4, '1101111010011001': 1
0, '0001101100011101': 3, '0111000000111111': 1, '1000011101011111': 3, '00101001100
00011': 7, '0011100110101010': 2, '1110000100010111': 1, '1101001010000000': 3, '010
1001000001100': 8, '1101011100011100': 7, '1111000100001100': 16, '000001101000100
0': 1, '1000011001011001': 21, '0110100111010111': 5, '0000011111101011': 4, '100011
1101101111': 4, '1110010000111101': 3, '1011100010111011': 1, '0011100100111101': 4,
'1100011101001100': 3, '0101101010010111': 6, '1111111010100110': 1, '100110110001 00
000': 2, '1101011010010110': 22, '1101001111101011': 8, '1100101110001110': 1, '01111
10110000111': 5, '0110100001100100': 1, '0101001010001010': 4, '0101001100000101': 2
9, '0010010111010010': 5, '0010001101101100': 1, '0000110011110100': 1, '00001110001
11010': 1, '1010100011001110': 3, '0011000110100111': 3, '1010110011110010': 24, '10
01111010000010': 2, '0101111011101110': 6, '0101101010010101': 2, '110110100101101
1': 1, '1101001100010110': 8, '0001011110000011': 2, '0000011011011001': 6, '1111110
110110001': 1, '0111010000110000': 20, '1000111001101001': 29, '0100001101010110':
1, '1111000011111110': 1, '0011000100000000': 2, '1001111010111000': 1, '01100000010
11101': 2, '1101111100001100': 7, '1111000100100000': 28, '1110100111101110': 4, '10
00101011111100': 2, '1101001001100001': 1, '0001011000111001': 2, '011100010001001
0': 5, '1111110100000101': 5, '1101011110100101': 1, '0101111000110110': 3, '1010010
101010000': 6, '0111100111011010': 5, '1000000111110110': 1, '0101011101101000': 1,
'0010110011100100': 5, '1110110000001001': 1, '0000011000010100': 3, '11110001011110
10': 3, '0000111001001111': 6, '1010110101100000': 6, '1000011100111100': 3, '001100
0101110000': 1, '0000011001100111': 7, '0110010011010100': 1, '1011100110101011': 3,
'1101001100111101': 19, '1101111110111011': 9, '0101001101011011': 1, '0101011100110
111': 1, '0101101110001000': 3, '1000111010001101': 2, '1101011111010011': 3, '11010

01110001100': 5, '1011000110110011': 4, '1101011001110001': 9, '1110010001111000': 4, '0110110001000111': 2, '1010100011110000': 2, '0101011010101000': 5, '10111001001 10100': 4, '1000000100000100': 1, '1110010001110011': 2, '1011000110111000': 1, '100 0111100100001': 3, '1110000110000011': 1, '0101011001010010': 3, '1100111001001101': 2, '1001111000100100': 4, '0111000001001110': 1, '1101111110001011': 3, '11000110011 01001': 2, '1101101100110010': 3, '0111110010110101': 1, '1101011000111111': 9, '010 0101011111011': 1, '0000101101011100': 23, '0111110100001010': 1, '0101101000111100 0': 5, '0010000100110110': 4, '0000111010100110': 8, '0001111110111110': 2, '0111000 100011111': 4, '1010000100100001': 2, '0110000111110011': 1, '1001101110000111': 1, '1010001011001011': 1, '1000111010010100': 1, '1001011000111100': 1, '00011110001101 00': 3, '0111000100111110': 9, '0100001111111110': 1, '1101001100000111': 6, '111110 0010110000': 2, '1101101000010110': 3, '1000100011111011': 1, '0101111010101001': 5, '0011100110010010': 2, '1011010110001011': 1, '0000111101011100': 6, '01111101011101 00': 4, '0010000011100011': 7, '0000001110000011': 10, '0000111101011001': 4, '11111 00110000101': 7, '1000001100011001': 4, '1111100010010000': 2, '0110110001111110': 1, '1101011001001001': 6, '1101111110101011': 5, '0001001100000100': 2, '01101100000 01100': 1, '1101101100111001': 25, '1101111100100000': 5, '1000011001010101': 17, '0 000011010000100': 3, '0101001101110110': 6, '0111110111101010': 1, '010101101110111 1': 4, '0011100110110001': 1, '1111110000011110': 12, '0010110011101000': 5, '010101 1101100100': 2, '0000011110111011': 1, '1000101110000011': 5, '1101111011001110': 4, '0101101001101101': 2, '0000101100001101': 3, '1000111001011011': 2, '11011011010011 00': 3, '1010110101001100': 5, '1110010001111100': 2, '1000111100101010': 1, '100000 0100001101': 1, '1001101010111110': 1, '1011110100110000': 1, '1111100001011011': 1, '1100011011010111': 1, '1110010011111010': 2, '1000101100000010': 1, '11110001010011 01': 3, '1010000100000101': 5, '1111100100100110': 5, '1100011011010110': 1, '110101 1010101111': 17, '1111000010101011': 2, '1000011101101101': 3, '1110110011010001': 1, '0000011101111110': 3, '0000111001111100': 29, '1101001000110110': 3, '1101111000 110101': 27, '0111110111010110': 3, '1110000101100100': 5, '1111110110111101': 1, '0 101001110110101': 4, '0010010101100110': 1, '0010100001010010': 5, '111101011010100 0': 1, '0101101111110111': 4, '0000001011110010': 7, '1010000110111101': 1, '1010010 010011000': 1, '0000001101100110': 6, '0000101111011101': 8, '0101101010111101': 3, '1010111110000001': 1, '1111010100110110': 3, '0011100010010110': 2, '10100001110000 10': 23, '0010010011001100': 8, '0010100010000011': 2, '1011010000011100': 6, '00101 00011111010': 7, '1111010100111010': 1, '1101011101110101': 5, '0101011101111000': 2, '0100111001110001': 1, '1010000100110010': 1, '1111000100011110': 5, '01011111010 10101': 3, '0011010100101110': 1, '1000111010101110': 9, '0000111101010100': 1, '111 1010101010011': 1, '1111100110001000': 6, '0000110111011110': 1, '1000011111010000': 1, '1111110100000001': 6, '0101101001001000': 1, '0000101100101000': 7, '00110001001 11100': 6, '1010110011011100': 12, '1111010000011000': 21, '1111000111001111': 9, '1 101101101000010': 1, '0110110101100100': 1, '1000101011111000': 1, '000000111001111 0': 5, '0010000011011110': 8, '1100011001111001': 4, '0011000100000001': 2, '1001111 010111001': 1, '1110000111110101': 1, '0011000000001000': 1, '0000001101001111': 10, '1101111001111011': 1, '0111000101101101': 7, '1111000111110101': 4, '01010011111111 11': 2, '0010100011010011': 7, '0001101010000111': 1, '0110110001100100': 1, '000010 1110000010': 7, '1010110111100010': 1, '0010010000001101': 7, '0000001100010100': 5, '0100111001011000': 2, '1000001100101101': 5, '1111010000111011': 7, '01111100111111 10': 2, '1111000001010100': 4, '0000001111111011': 18, '1010000011111000': 2, '01110 10001111101': 9, '0100111100100000': 1, '0001001110100011': 3, '0001011010000101': 1, '0101111000010011': 6, '0101011111011010': 2, '0010110110000011': 2, '00111001000 00001': 2, '0010100110010101': 2, '0000001101000000': 16, '1101011111110110': 1, '00 10000000001001001': 7, '1010010001100010': 6, '0010010000111101': 3, '100001111111111 1': 2, '1001111011111111': 1, '1010110010001111': 5, '0101001101110100': 13, '111111 0000111001': 22, '0001001010010111': 1, '1111000101111100': 13, '0000011000010110': 1, '0101101010101000': 1, '0000011001111101': 16, '0000011111111010': 6, '1100001101 000100': 3, '1010110011100111': 24, '0101111101111101': 3, '1011010010111000': 1, '0 000101100001100': 3, '1000111001011110': 7, '0000101101111111': 5, '010110100001111

1': 1, '1000011011000000': 3, '1000101110011011': 2, '1001001100101110': 1, '0000101
101000011': 4, '0101101000100011': 2, '0111110100010101': 5, '1101011011100011': 5,
'1010010011011001': 3, '0011000011011011': 1, '1111110100010110': 3, '00000010000110
00': 1, '0000100111111011': 1, '1010000101111101': 15, '1101101101011010': 5, '01000
01110101100': 1, '1000011011100010': 18, '1011000010011011': 1, '0101111000110100':
18, '1001101001010110': 1, '1111100000001010': 2, '1010110110101010': 5, '1111010011
110100': 3, '0111110010010101': 8, '1000101000000001': 2, '1110100101110011': 1, '11
10110101110110': 1, '1100111011010100': 1, '0101001111101100': 1, '111111101001010
0': 2, '0010010101111011': 1, '1000111000111000': 3, '0011010010110111': 2, '0101011
100000100': 4, '1010100001111110': 2, '1111111101011101': 1, '0000101001101011': 2,
'0010110010001011': 10, '0111010011111010': 6, '0111000010110001': 2, '0111000010010
000': 3, '1101111100110101': 5, '0000001001001100': 5, '1011000000100111': 1, '11001
01100101011': 1, '0000001011101110': 3, '1000011101110000': 6, '1010010001011111':
7, '0101101111110001': 3, '0101101110000000': 10, '0111100011111111': 1, '1010000001
101101': 8, '1100101100010001': 1, '0000101101001010': 4, '0101101000101010': 4, '11
01101000111000': 7, '1101101001001100': 1, '0111010110011110': 11, '000000011010100 0': 16, '0011100000100110': 1, '1111010110000110': 3, '1101110000111100': 1, '100011
0011011011': 1, '0111100101111101': 5, '0010000000010000': 1, '0101001010010111': 8,
'1111110110111110': 3, '1110000101100101': 3, '0010000111100100': 5, '11100101111010
10': 1, '1001101010100111': 3, '1111010000101011': 5, '1000011001111010': 4, '110001
1011100110': 1, '0111000010001100': 1, '1111010110110111': 7, '1101001100011111': 4,
'1001101101010000': 3, '1010010010000101': 2, '1000111101010111': 1, '11010110001000
10': 6, '1111110010010000': 9, '0111000000001100': 3, '1000001011010100': 4, '101000
0100001100': 9, '0110100001010100': 2, '0100111011100011': 2, '0001011011001010': 1,
'0111000011001110': 2, '1100001011110100': 1, '1001101100110001': 2, '10001110000000
00': 3, '1010111001111111': 1, '0011000111100110': 1, '0010110100100001': 1, '110110
1111000010': 3, '0111100111110011': 6, '0001101100111100': 5, '0101111000010010': 8,
'0111010011111111': 1, '0111000010110110': 7, '0001011010110010': 2, '01100001110110
11': 2, '1011110110011000': 2, '0111101110011001': 1, '1000001100001011': 3, '001011
1001100100': 1, '1111110010001101': 2, '1000101111000010': 22, '0101011011010010':
4, '1111001101011010': 1, '1111100101110101': 14, '1000001000111001': 2, '1111000111
110111': 7, '0000001101010011': 12, '0100111010010111': 2, '1101011000001011': 8, '0
010100111111001': 6, '1010010111101010': 9, '1010110010110110': 1, '110101100101111
0': 2, '0010100001001011': 1, '1100111011011000': 1, '1111110100100100': 8, '1111010
010010001': 2, '0101001010110111': 6, '1101101101011001': 7, '1111000101111111': 2,
'0000011000010011': 2, '0111010110001000': 1, '1001101100011011': 2, '01011010100111
10': 3, '0101111011100101': 3, '0010000111010110': 21, '0000111010001111': 7, '11011
01101001001': 4, '0101001011000011': 2, '1111010010000001': 6, '0100011010101111':
1, '1010010001100110': 7, '0101011010101110': 11, '0111100110101001': 7, '0000001000
011010': 1, '1111000110111100': 4, '0010100100000001': 3, '1101001111011010': 4, '11
10100101011010': 1, '1111010011011011': 5, '0111110001111100': 5, '001000010100111
0': 5, '0111110110110001': 5, '1011010100110100': 1, '0011100100101101': 4, '1101111
001000100': 1, '0000110001101000': 1, '0000111001001010': 4, '1010110101100111': 2,
'1011010001010001': 4, '0001001100011001': 3, '1001011000011010': 1, '10000010100010
10': 6, '0101011000100100': 17, '1001111010110010': 2, '0010010101101100': 11, '1100
011001100000': 1, '1111100100101110': 12, '1101001111101010': 4, '1100101110001111':
1, '1100101101100001': 3, '0000101100111010': 2, '1011010011101110': 1, '01011110100
10101': 6, '0101111110001001': 2, '1001011011110111': 1, '1010010000110110': 1, '010
1011011010101': 1, '1111000110001001': 9, '0011010100010101': 1, '1000111010110101':
1, '1111000010000000': 2, '1010100111110101': 7, '0111010100001100': 4, '11101001001
01100': 1, '1101101100000010': 3, '0000111101101111': 1, '0111010001111000': 6, '001
0000111011100': 8, '0010000101100110': 6, '1011000001101100': 1, '0011110001110100':
1, '0101001010100111': 8, '1010000010110000': 1, '0101000100010100': 1, '10101001110
11100': 6, '0010110101010000': 4, '0000001100110001': 3, '1010011101110000': 1, '100
0111000000101': 3, '1001101100110100': 2, '1101011010011110': 16, '111111010001010
1': 9, '0101001000011000': 6, '0100101101001100': 5, '1111100011010011': 2, '0111010

100100111': 2, '1000101000110101': 1, '0101101101110101': 13, '0111110011001011': 3, '1111010000001100': 23, '0100101111111000': 2, '0000001011000101': 2, '1010010101011100': 5, '0111100111010010': 5, '0101001011100000': 1, '0011100100011100': 4, '0000001010010111': 1, '0000011111111100': 2, '0010011101001110': 1, '1000001001101101': 3, '1010110101011010': 2, '1011010011010011': 1, '1110000101010100': 2, '0101011100101100': 4, '0101111000100001': 19, '1001011010100011': 2, '0000001111011000': 8, '1101001101011110': 2, '1010010000010001': 8, '0100011011111010': 1, '1010010111011110': 4, '1000111101111101': 8, '1100011101001000': 2, '1011110010111001': 1, '1110110011000011': 2, '0000011111100011': 9, '0110100111011111': 4, '1101011100010000': 9, '0010100100100101': 4, '0000101100100010': 1, '1001111010101010': 1, '1000010001000101': 2, '0000111101111000': 7, '0010000001010010': 3, '1111000010001011': 3, '0100101101011001': 2, '0000010001101011': 1, '1000010011000011': 2, '1011110000001010': 1, '0011110010000110': 2, '1000101100100000': 3, '1001001010010110': 1, '1101011010010101': 8, '0011100011100001': 1, '0000001101001011': 9, '1110000101100000': 3, '0111000110001000': 6, '0000011001110110': 5, '0101111001111101': 6, '1110000101001001': 4, '0011010001111100': 2, '1111010110100011': 5, '1100011000010001': 1, '0111000110011011': 23, '1010010101101111': 1, '1111000110011011': 24, '0010010111111100': 4, '1100001110110010': 1, '0010010000101011': 2, '1001101110010000': 2, '1101101010000000': 1, '0111110010011000': 8, '1101100101110001': 1, '1111010011111001': 1, '0000101100001010': 2, '1111100111011011': 3, '0011000010110010': 3, '0101011001110001': 4, '1111100010001100': 2, '1111000010111001': 2, '1101011010110101': 3, '0111010111011110': 1, '1110100111111110': 3, '1111000000110001': 6, '0011100000010100': 3, '0010110101110100': 8, '0111100111000010': 3, '1111000000011111': 3, '0101001110101011': 19, '0010001111110110': 1, '1111000010100100': 2, '1101011010100000': 7, '1000111111110001': 8, '1100001100010111': 2, '1011010001000100': 2, '1000111101110011': 2, '1010010111010010': 5, '1000101011011001': 2, '0010100101011000': 14, '0001001110110110': 3, '0100101011001101': 1, '1111010100110101': 5, '1101011101111010': 1, '1101101100101100': 23, '0110010011101011': 3, '0010101110001111': 2, '1011110000100001': 3, '1100101101101100': 2, '0101101001010011': 1, '0101101011110010': 3, '1000111011100100': 9, '0000001100110101': 5, '0010010110101110': 6, '1111010100011001': 7, '0011000010101100': 1, '1010100001101111': 1, '0111010000110111': 4, '0001111100010101': 1, '1010010101010001': 3, '0000111111100110': 8, '1000001110111000': 3, '0010000011111101': 2, '1000011000010000': 9, '1000111010110000': 1, '1010010101111000': 3, '1111000010000101': 1, '1110010110100110': 1, '0011010100010000': 2, '1000001000110001': 2, '0010110101101000': 10, '1010000001000111': 2, '0101101100100010': 4, '1101101011011011': 6, '0101001010001101': 1, '0111100010111111': 11, '1111100110110111': 25, '0010000100001110': 2, '0101011001000000': 1, '1010000010001111': 2, '1100011001011001': 3, '0101011110001110': 10, '1010100110011110': 3, '1100001101010101': 2, '1101101100101101': 18, '1010100110101100': 3, '1010110101000101': 11, '1100111111111000': 1, '0110000001100100': 1, '1101111100011001': 6, '1000011001000110': 4, '1000111001110110': 3, '0011010010011110': 3, '1101001010100010': 4, '0100111100001001': 1, '0011110010111010': 4, '1010110101010101': 7, '0010010110100011': 4, '1100001001001110': 1, '1010100010000101': 1, '1000001000000100': 1, '1101111101110001': 2, '1010010101001101': 4, '0010100011000011': 6, '1010000011111001': 2, '0110110110000010': 1, '0000001111111100': 11, '0101101010010010': 9, '0101111011101011': 4, '1001101100010101': 3, '1101101001011110': 1, '1000001011000010': 4, '1110000001110000': 1, '0111000000100101': 4, '0001011000100001': 2, '1101001001111001': 1, '0101011010011000': 6, '1000001100101001': 2, '0000111011110111': 26, '0001101100111101': 4, '0101111000010101': 23, '1010000111000100': 6, '0101001001011001': 2, '0000100100110101': 1, '0010110111010101': 1, '1111100101111100': 9, '1011011001011101': 1, '0101001110010000': 6, '1010010110010110': 2, '0101101110000111': 26, '1010001011110111': 1, '1111100011010110': 2, '1010100001010011': 1, '1111110011011111': 6, '1001011001110101': 2, '1010010001001010': 9, '0001101110000011': 3, '0100111111101010': 1, '0110000111111110': 1, '1100101111001111': 1, '0111010100010111': 1, '1000111010011011': 1, '1001101110001010': 1, '1110000110100111': 1, '1001111111101000': 1, '1001101101111101': 1, '1101101000110100': 7, '1110100110000010': 1, '1110000011010111': 1, '0010010011111001':

6, '1100001110100001': 1, '1000011111111110': 6, '1101111001111101': 10, '0111000101101011': 1, '0000001101010101': 20, '1000001100100000': 4, '1111010000110110': 5, '0100101111100111': 4, '1011010001010100': 1, '0101111110111101': 3, '0111010001011100': 7, '1101101101101110': 3, '0010000111110100': 5, '1010010100111101': 1, '1010101111000111': 1, '0111100110010000': 8, '1000001111110010': 19, '0000111110100100': 2, '0011010100011101': 2, '1000111010111101': 1, '1111000010001010': 5, '0111010011010110': 7, '0101001001010000': 2, '0101001110000111': 16, '0010000110010010': 2, '0011000100010101': 4, '0100111111100011': 1, '1111100110011111': 26, '1010000010101110': 2, '0000111000011111': 2, '1010100010101011': 3, '1001011000101001': 2, '0010000011000001': 3, '1101101110101100': 7, '1010000101101111': 4, '1111000010010000': 1, '0101101011111001': 1, '0010100110000010': 10, '1100101110010010': 2, '0010100001111001': 4, '1000101100010011': 2, '1100001000001000': 1, '1111000010100110': 8, '1101011010100010': 19, '0101111011011001': 2, '0111101100110011': 1, '0010010000110110': 1, '1000011111110100': 1, '0010000001111000': 4, '1000001001001010': 4, '0000001000101110': 1, '0010100100110101': 6, '0001011010111001': 1, '1010110011010110': 21, '0101001010101010': 8, '0010000110001000': 1, '1000011101111101': 6, '0000001011100001': 5, '1100001100001000': 1, '0010010101000000': 6, '0100101010111111': 1, '1101011101010001': 2, '0000111001000110': 7, '1110010011001010': 3, '1101001100101010': 4, '1000001011100111': 18, '1000011101001101': 8, '0011100111111010': 2, '0000001111001001': 7, '1000011111100110': 7, '0000011100100100': 1, '1111000100000110': 4, '0010000011000101': 2, '0101001011111010': 2, '1010100100000010': 2, '1010110000110101': 6, '1100101111110011': 2, '0110010011010010': 1, '1101001100111011': 9, '0010000010101110': 3, '0000001101011110': 8, '1000101000001101': 1, '1110100101111111': 1, '1111010011111010': 2, '1111010100010101': 4, '0100111100010000': 1, '1101001010111001': 2, '0010000111100001': 4, '1111100011110010': 1, '0100111011111010': 3, '0111000000000111': 3, '1111110010011101': 8, '1111000100010100': 21, '1010000100111100': 4, '0000101101101011': 4, '0101101000001011': 1, '0001001101000101': 1, '0011100110001110': 2, '1010100001010101': 6, '0000111100000001': 3, '1100011010001111': 1, '0111010011001110': 7, '1010110101111011': 1, '1101001110111001': 5, '0011000111101100': 1, '1111110100000010': 1, '1110010001011000': 2, '1011110010011011': 2, '1101101111101001': 3, '0100100101001110': 1, '1010100100001000': 5, '1101001101100111': 1, '0000011011100001': 8, '0101001100101011': 9, '0010010111111010': 3, '1010110001011111': 10, '1010100101101110': 6, '0010010000111111': 2, '1000011111111101': 3, '1010000011011010': 6, '1101111100111000': 8, '1011110010010110': 3, '0101100010000010': 2, '0000001110010011': 4, '0010000011010011': 5, '1000101011011011': 3, '0000101010100111': 1, '0010100101011100': 24, '1000101010101111': 3, '0000101011110001': 1, '1111100111010100': 2, '1101111110100011': 4, '1100101011001111': 1, '0010110010101010': 8, '1000101101000110': 4, '1001001110010011': 2, '1101001101000010': 1, '0000011011000000': 4, '1100011000101100': 1, '0111100010111010': 8, '1101001110010001': 6, '0001101110010011': 1, '0000011011110111': 27, '0101110100011101': 1, '0110100101110110': 1, '1010000110101010': 7, '1101100100001100': 1, '1101000100100101': 1, '0111000010101100': 1, '1010000011001011': 5, '1111000011010011': 3, '0000101011010110': 8, '1000001011100000': 2, '1100111100011000': 1, '0000111011011100': 5, '1000001011011100': 2, '0111000000000100': 3, '0001011000001000': 1, '1101111011100111': 2, '0011000110000001': 1, '1111000101000110': 1, '1111100100101101': 20, '0000001000110001': 1, '1111000111010111': 6, '1100011011111100': 1, '0000001001111001': 5, '0100001111000110': 3, '1101001001110011': 1, '1101111001110000': 11, '0111111100110001': 1, '1111000101110101': 8, '0101001010111101': 3, '1111010010011011': 21, '1010010010101110': 10, '1000111011000100': 8, '0011010100000100': 1, '1111000110011000': 8, '1011010110000101': 1, '0011100110011110': 2, '0011000111110000': 1, '1101010010001110': 1, '0101011001101010': 1, '0001001110000010': 3, '0000001010010011': 1, '0010100110001100': 1, '0000011010111111': 2, '1101010011100111': 1, '1101001010001011': 6, '0101001000000001': 7, '0111011000010000': 1, '0111100111011110': 6, '1010010101010100': 3, '1000101111001100': 7, '1101011110011110': 6, '1111100111000011': 4, '1000101111110101': 4, '0111010011100111': 5, '1111110001111100': 2, '0010110010111110': 4, '0000011111110000': 1, '0001101000111001': 1, '0101111011010100': 2, '0001101111100011': 1, '001010

0111100000': 10, '0110110011101011': 3, '1000101001000001': 8, '1001101000010111':
1, '0110000100001110': 1, '1101011011110110': 7, '1111000111101111': 5, '00101001001
10100': 3, '1111100100001100': 17, '0000101001110010': 3, '1101101111101010': 5, '00
10110101001111': 3, '1010011011010111': 1, '1011000001100010': 1, '1001011000010000
0': 2, '0010000011001000': 2, '1101001100011110': 4, '0000110010010111': 2, '0010110
101011101': 6, '0000111000010001': 5, '1101101000010011': 4, '1111100010110101': 2,
'0101111110110110': 4, '0010010000010000': 4, '0011110110001010': 1, '000000010000001
00': 1, '1000001001100000': 6, '0000111100101100': 2, '1010000111001100': 5, '000000
0110001011': 1, '1010100110001110': 9, '1011110100111000': 3, '1101101100101010': 6,
'0000011101111000': 10, '1000011101101001': 5, '1001101101011001': 1, '1010110111110
110': 3, '1010100101011011': 3, '0001011011000101': 1, '0001101110100011': 4, '00100
00010110000': 1, '1001011000111000': 9, '0111000111011101': 2, '0101111000111100': 2
4, '1101101101000000': 2, '1111010010001000': 5, '0100001101101110': 1, '01011001000
11001': 1, '1000001001011001': 3, '1111100100101010': 2, '0110100001010101': 1, '101
0000100001011': 2, '1010110011111101': 7, '0101101110111001': 9, '0000101011110010':
4, '1111110010111000': 5, '1111000000010101': 7, '0111100111001010': 8, '11001110101
00010': 1, '0000101101100110': 4, '1000001001010100': 4, '0000101001000010': 3, '010
1100100010100': 1, '1101001110100101': 3, '1010000001001111': 4, '1111010101111001':
2, '0101011001001011': 2, '0010000110111111': 2, '0011010000101110': 2, '00000110011
01000': 25, '1101001101100100': 2, '0000011011100010': 22, '1010110100100110': 1, '1
011000111001101': 1, '0111110011100111': 5, '1111010000100110': 3, '100000110011010
0': 4, '1101011011110111': 6, '0110000100001101': 2, '0111010100110001': 6, '1110100
100010001': 3, '1010010101000011': 3, '1111100000100110': 2, '0101001111011010': 6,
'1000011010110101': 1, '0111001110111010': 1, '0101111110111111': 10, '0101001110101
001': 6, '0010010100111000': 1, '0000010011010000': 1, '1010010100001101': 1, '11110
00010011100': 1, '1111010101000100': 1, '0011100101011000': 2, '1111100101110001':
4, '0101111000011010': 7, '1101110000010011': 1, '0011100100101001': 3, '01010110111
01110': 4, '1101101001110101': 2, '0000001011011110': 7, '0010110111010110': 11, '11
01001110110101': 9, '0110100111000010': 4, '1101011011001100': 3, '110110101001110
1': 1, '0111000110011101': 6, '0101101001111101': 4, '0000101100011101': 2, '0011000
000100100': 2, '1101111001001100': 4, '0000101111111000': 3, '1000111100001010': 1,
'1101011001011111': 2, '1010010010010111': 8, '0111100000000011': 4, '010110100011010
1': 4, '0000101101010101': 25, '0101100000101100': 1, '1000001101101100': 28, '1111
010010101001': 4, '0010000100101101': 7, '0101111010100100': 8, '1000111011001100':
5, '1010101111010110': 1, '1101001100110111': 11, '1111100010101101': 5, '0010000011
001010': 4, '1010000000111001': 4, '0101101100110110': 7, '0001101100000010': 3, '01
10000101001000': 1, '0000001010000111': 5, '1111100101011110': 3, '010101100011100
1': 18, '1101011001110101': 6, '1011000110110111': 3, '0001011111011011': 1, '101010
0011110001': 1, '1010000011010010': 3, '1100101001010110': 1, '1111100111101011': 3,
'0100101101001000': 2, '1000011000110110': 3, '1101111110000011': 9, '11010010100110
00': 2, '0101011001011100': 7, '1100111001000101': 2, '1001111000101110': 1, '001011
0101001000': 2, '1010110001110011': 7, '0100101101011000': 3, '1000111010111111': 4,
'1111000010001100': 2, '1011010010011101': 1, '1000111010000000': 1, '00000010111010
00': 3, '1100101111100011': 7, '0000101000101011': 1, '1100101110010011': 1, '001010
0001111000': 2, '1101111101101100': 3, '1100111001101010': 2, '0101111111011111': 2,
'1100101111110110': 2, '1010000011010011': 7, '1010000001111101': 4, '01010111000110
10': 3, '1000001111101110': 13, '0010110101110110': 1, '0111100111000000': 2, '11110
00000011101': 6, '1010010001101010': 8, '1111100010110110': 14, '1101101000010000':
8, '1110100011111011': 1, '1011010011110111': 2, '1110000101110100': 1, '11010011110
10110': 4, '0111100001100100': 1, '0100001001000101': 1, '1010000011110110': 7, '001
0110001010101': 20, '1101111011010010': 7, '1000101100111101': 3, '010100110011000
1': 17, '1100001011011100': 1, '1010000101101011': 5, '0000001101001101': 21, '11000
011000100110': 1, '0111100010110100': 4, '1101011010100110': 17, '1111000010100010':
3, '1000111000101111': 2, '0101011011001001': 4, '0011010110101111': 2, '00101001100
01011': 10, '1101011110011010': 5, '1111100111000111': 4, '0110110111101000': 1, '10
10100001111010': 2, '1000111110000010': 4, '1110010101101000': 3, '1011100010100110

0': 1, '1111110100000000': 8, '1111000000101100': 3, '0101011000010100': 21, '101011
0111100110': 5, '0000101110000110': 5, '0101011011001010': 5, '0101111110110000': 2,
'0000011111101001': 1, '0010010000010110': 2, '0101101010111100': 1, '00001011110111
00': 8, '0000111101001111': 2, '0101011110011110': 6, '1110000111101011': 1, '101000
0111100110': 20, '0011110000101100': 2, '0010000100101001': 9, '1101101000011111':
1, '1001001001010111': 1, '1000101101101001': 30, '0010000100010101': 3, '1100001101
011111': 1, '1010100110010110': 4, '0011000101000011': 1, '1101011000001101': 25, '1
000101000110100': 1, '0111010100100110': 4, '0111000010100011': 10, '000001111111111
1': 9, '1101101010001101': 3, '0010000110100010': 8, '1110100101011000': 1, '1001011
110011011': 3, '1000001101111110': 8, '0101101100101010': 5, '1000111010101010': 7,
'1111100100101011': 6, '0111111100000100': 1, '1111000101000000': 2, '10100001000010
10': 1, '0000000101100101': 2, '1010110011010000': 8, '1000111111011001': 4, '110000
1100000101': 2, '0000111010001101': 2, '1000110010011011': 2, '0011010000001001': 4,
'0000011110001110': 1, '1111000101010111': 5, '0110010001110000': 3, '10000110100010
10': 6, '0011000110011000': 1, '1010000111010001': 5, '0110100101001101': 2, '100100
1000011011': 2, '1010010011110001': 7, '0101001111011110': 4, '0101001101011000': 8,
'1101101000100100': 6, '0111010100100000': 7, '1110100100000000': 1, '00001110000101
01': 3, '1101111101011000': 1, '1010100101111011': 5, '0111000010001110': 5, '001010
0110111111': 2, '0101001001101101': 1, '0111110100010000': 6, '0000101101000110': 5,
'1101100000000100': 1, '0000111011101000': 4, '0011100101111101': 1, '01011111100100
00': 4, '1000011100100111': 1, '0000111000111000': 3, '1111101100000010': 1, '000010
1111001010': 19, '0101011110110110': 2, '0101101011101010': 1, '0110110000100010':
1, '0010000111101011': 22, '00001010000001110': 1, '1101011000101100': 17, '100011110
1011111': 1, '0011110010001010': 2, '1111110001010111': 4, '1101011100110001': 7, '0
111100000100110': 2, '0111010010010011': 27, '0101111110101111': 9, '111111101100000 1
0': 6, '1010100100110001': 10, '1010110001100100': 14, '1111110111110110': 3, '11011
01000101010': 2, '0011000101110111': 1, '1010100110001000': 1, '0111010010010010': 2
3, '1101011111011110': 3, '1101001110000101': 8, '1101001010000110': 6, '01111101010
10101': 3, '0110110011010111': 2, '0111110111110011': 3, '1111010001010001': 5, '111
1110010110001': 7, '1101110001111100': 1, '1010110010100010': 5, '1011010000100001':
1, '1111110101111011': 1, '1101101000001111': 3, '0101111010111100': 5, '00000010110
00110': 1, '1111100100010110': 5, '1101101111010000': 1, '0000110111001110': 1, '101
0110010101011': 10, '0000101011110111': 4, '1000001000111111': 1, '110100111111000
0': 2, '1000111000100000': 3, '1110010100010110': 1, '0011010110100000': 1, '0000111
001000011': 8, '1010110101101110': 2, '1101111001000000': 4, '1000001111100110': 23,
'1111010110010110': 5, '0010011101010010': 1, '1000011111111001': 2, '00010011010111
00': 2, '1101011100010011': 1, '1100001101000111': 1, '0101111011011100': 3, '011000
0101010101': 1, '0101111100110001': 6, '0111010011010011': 8, '1101011011001010': 6,
'1101100110011000': 1, '0111000010110111': 4, '0001011010110011': 2, '11110101110010
11': 2, '1000101101001010': 7, '1001001110011101': 1, '1101011010011100': 7, '000101
1000011101': 1, '1000101101100010': 8, '0000000101111101': 1, '1111010110010010': 7,
'0101011100010101': 10, '1010100001000100': 8, '0101101111000011': 2, '1000011110100
010': 2, '1111110001010000': 6, '1110010111100111': 1, '1000101100011101': 6, '01010
00100110010': 1, '0111010100001001': 5, '0111010001001101': 7, '1110110010001010':
3, '1111101010111111': 1, '0111100000011001': 9, '1100111101111001': 1, '11111100101
00101': 7, '0111010000000111': 5, '0010000110101011': 5, '0101001010101111': 5, '000
0011000101011': 3, '0000011000001011': 2, '0011010011111011': 1, '0011100100111000':
3, '1101001111001100': 2, '0101101001011000': 3, '0000101100111000': 2, '00000011101
01100': 1, '0101101101010011': 2, '1000111001000110': 7, '1000110010101111': 7, '000
0011001111010': 6, '0001011101111101': 1, '1101100110010011': 1, '1010010101011000':
4, '0000010111101111': 1, '0111110100101001': 3, '0010010000110101': 4, '10000111111
10111': 6, '1111100010100100': 1, '0111100101111010': 4, '1001001100011100': 2, '001
0000000010101': 2, '1010000111101001': 7, '0101001010010010': 3, '1100101101000011':
1, '0000101001011101': 9, '1101001010110010': 7, '1111110001011100': 7, '00101001010
00110': 5, '0111110001110000': 11, '1000101001100100': 7, '1111010011010001': 3, '10
00001101001001': 23, '0111110100100010': 2, '0000011000101001': 5, '010101100110010

0': 1, '1011010010110110': 1, '1101001111101110': 2, '0111110110000000': 2, '1000111 000001000': 4, '0111000011101101': 1, '1000101110110110': 3, '0111010010100100': 5, '0000101100111111': 3, '1000011011111001': 4, '1000101001000100': 4, '00101001111001 01': 7, '0100001011000000': 1, '1100011001110001': 1, '0010100111000101': 4, '110111 1001011110': 1, '1111000111011101': 1, '1111100111010010': 11, '0101111101110000': 2, '1010100001011101': 1, '1111110011010001': 1, '1111000100000100': 20, '1000011111 001011': 3, '0010010011000000': 11, '1111000000011000': 2, '0100101001100100': 1, '1 101011100100000': 3, '1100001011000011': 1, '1010110111001001': 1, '010110101000100 1': 2, '0111100110001000': 6, '1010000011000010': 5, '0000101110101010': 10, '010101 1010101001': 9, '1011100100110101': 5, '1010110011010001': 4, '1101110010111010': 1, '0101101100001110': 10, '0010010101011010': 4, '0110100101010001': 3, '0011000100101 111': 1, '0111100110000100': 2, '1111010001100100': 2, '1010010011011100': 9, '01011 11011011101': 2, '1100001101000000': 5, '1110100110000100': 1, '1101101000110010': 5, '0001001111101110': 1, '0000111100111100': 1, '0100111101111110': 1, '00101000011 01100': 4, '1111110101001001': 2, '0101011000010011': 6, '0111110010000000': 7, '110 1101010011000': 3, '1001001101010101': 1, '1111010011100011': 2, '1110110100000001': 1, '1110010011100000': 1, '1111110011110011': 10, '0100011001001001': 4, '1010010100 101101': 2, '0010000001001101': 12, '1100111001110101': 1, '0101001101001101': 5, '0 010010001111001': 19, '1101101001111100': 3, '0000001011010011': 6, '011000001100100 0': 1, '0010010011100011': 23, '0000001111011100': 3, '1111010101110001': 3, '011101 0011001011': 4, '0010000001010000': 7, '0111000011001100': 1, '1100001011110010': 1, '0001101110101010': 3, '1110010001001000': 1, '1010010010001001': 1, '10110001100101 10': 2, '1111110010111101': 9, '1111010101110100': 3, '0111000011000111': 3, '110000 1011111111': 1, '0101010100110000': 1, '1000101000100001': 3, '0000111010101011': 1 1, '0110010011011011': 1, '1101001100110010': 7, '0111010001000111': 2, '00011111001 00101': 1, '1110110010000010': 1, '1101111111101011': 3, '0111000011110111': 3, '101 0001101101010': 1, '1001001111111010': 1, '1010000110011011': 2, '1111100110011100': 9, '1111100010000110': 7, '1001101100011101': 1, '0101111011100011': 3, '01011010100 11100': 1, '1101101001010100': 3, '0111010010101010': 17, '1000100101011001': 1, '00 10111001111010': 1, '1010100101001010': 4, '1010001101001100': 1, '001000001101111 1': 2, '0000001110011111': 3, '1010110111000000': 4, '0101101010000000': 2, '1101011 100101100': 4, '0010100010010011': 1, '1110000111111101': 1, '0111000100100110': 8, '1010010010010101': 1, '0101011110100010': 8, '1111100000111010': 3, '01101100000101 11': 1, '1000111101011000': 4, '1111010001010000': 7, '0000101000011000': 2, '100101 1010010010': 4, '0010001100001001': 1, '0000001011110110': 4, '1010010011101000': 1 2, '1000100011010110': 1, '1010100101110101': 12, '0000101011000110': 5, '0010100101 111011': 6, '0101011011110010': 3, '0101001010101011': 6, '0001100111111110': 1, '11 01101000111101': 9, '0110100111111011': 1, '1111100000001001': 5, '001111000000100 1': 2, '0101001101110000': 7, '0010100011011111': 4, '0001101010001011': 2, '0010100 011110101': 2, '1101011110101011': 5, '0111110101000111': 1, '0011110110101000': 1, '0110000111011101': 1, '0111010011011110': 5, '1101001001010111': 1, '11011110010100 00': 8, '0000001110111110': 4, '0101011100011101': 7, '1111010110110110': 7, '011101 0001010111': 2, '1101101101100001': 1, '1111000010110011': 7, '1110000111111111': 3, '1101101110001000': 6, '1111110011111110': 8, '1110010011101111': 4, '10000010000110 10': 1, '1001011010001010': 4, '0001111110101100': 1, '0111010011001010': 5, '110001 1010001011': 1, '0000111100000101': 3, '0010000001001000': 7, '1101011111110111': 2, '1010010001100011': 5, '0011100000110111': 1, '1111010110010111': 5, '11000010111000 11': 2, '1000111001110101': 16, '0011010010111010': 1, '1000101111000110': 21, '0010 110101101111': 4, '0111100110111101': 10, '0101011011001011': 7, '1001011110000010': 2, '0011010000011101': 4, '0001111010011001': 1, '1101110010010100': 1, '01010011001 11101': 18, '0010010111101110': 5, '0000111000111101': 3, '1000011001101011': 7, '10 10100011111100': 2, '1001001110101100': 1, '1010000110001011': 8, '111100010111001 1': 4, '0110010001011000': 2, '1000011010110010': 4, '1010100001110000': 3, '0011010 110010001': 1, '0100011101111101': 1, '1111000000000100': 4, '0110110001100110': 1, '1101111111111110': 2, '1000101100101001': 6, '0110000110101010': 2, '00011110100010 10': 3, '0101001000111101': 13, '1101111011011001': 1, '1000011111011111': 6, '01100

00101111100': 5, '0001100100010001': 1, '0111010000110100': 24, '1111100000100100':
5, '0100101011101100': 1, '1010111001000111': 1, '0111011100110111': 1, '11011011011
01000': 6, '1101001010101010': 6, '1010100100011001': 6, '1010110000000100': 5, '101
0001101011111': 2, '1001011001001000': 1, '1000111101100001': 3, '0101011000010010':
7, '1100111111101010': 1, '0101001111110111': 12, '1101101101111000': 8, '0111010001
000010': 1, '1101101110101011': 21, '1100101101001000': 3, '1000101011110110': 3, '1
110100111100000': 1, '1111100101011101': 7, '1000010101111000': 1, '010101100011100
0': 23, '0101011000000000': 25, '1010100011001110': 20, '1011100100001101': 1, '1010
011001110011': 1, '1010110101110101': 6, '0001101100101000': 2, '1000100101100001':
1, '1110010001111101': 2, '1001101010111011': 1, '1010000111111100': 2, '10101100110
10111': 15, '1110010011100111': 1, '1111110011110100': 4, '1000111011010111': 19, '1
101001101000111': 1, '0000011011000101': 11, '0110010000101001': 3, '011101011101000
1': 1, '1110100111110001': 1, '1011101100001001': 1, '1000100101010001': 1, '0000001
101101000': 27, '1110000111110011': 3, '0101111100101011': 3, '1000001001111111': 1,
'0010110100011000': 1, '0000100111111000': 1, '0101101100101110': 3, '11010011110011
01': 1, '1011100100011011': 1, '0010110100101000': 2, '0000101011001111': 5, '001010
0101110010': 5, '1000011001000011': 12, '1010010010000010': 5, '1010000110101101':
1, '1111100110101110': 17, '1100001111001111': 2, '0101111001011000': 5, '0000111111
101011': 3, '0101111100110101': 5, '0110000101010001': 6, '1111000000000111': 2, '00
11010110010010': 1, '1001001101011000': 1, '1000100101010101': 1, '011110001011001
1': 2, '0001101100110100': 2, '1101011111001011': 2, '0111110100011101': 8, '0101101
000101011': 1, '0000101101001011': 8, '1101001111000000': 1, '0101111000101100': 20,
'1101111101001001': 1, '0101101010010011': 5, '1111111010100010': 1, '10011011000101
00': 2, '1110010011000000': 1, '1000111111110010': 4, '0010110010100111': 4, '011110
0010110110': 6, '1111000010100000': 1, '1101011010100100': 2, '1001111010010101': 1,
'1001101011101110': 1, '1110010001001100': 1, '0111000011001000': 1, '010101101110 00
01': 1, '1111100101101111': 2, '1100001111000100': 1, '0101011000010000': 22, '00000
11111100101': 1, '0111110110000101': 2, '0101011000011111': 7, '0000001101011101': 1
9, '1100011001100111': 2, '1010110111111100': 2, '1010100101010111': 7, '10101100010
00010': 2, '1100001111100110': 3, '1110010101000101': 1, '1000111001110111': 8, '111
1110110001001': 3, '0111010011010010': 9, '0001111110110000': 1, '1001001011010110':
1, '0011110010000010': 3, '1001001010010010': 1, '1000101100100100': 4, '00001110111
10001': 5, '1111110010001000': 6, '0111000111011110': 4, '1111110011011100': 1, '101
0100001010110': 2, '1111000001000111': 1, '0110100001011000': 1, '0110100011111110':
2, '0000001010101111': 1, '0001001110001110': 3, '0101011001100110': 1, '10111100100
10111': 4, '1101001010111100': 3, '0111010110000001': 2, '1000101101101110': 10, '10
11110011101010': 1, '0100010111001010': 3, '0010010001001111': 10, '000001100010110
1': 4, '1011000000001001': 1, '1011000100000000': 2, '1011010000100111': 1, '1111110
101111101': 4, '0111111010111110': 2, '0111100010000100': 1, '0000111111011110': 7,
'1101001111110010': 7, '0110000101110000': 2, '0101111100010100': 7, '11001011011001
11': 1, '0010100111010100': 7, '1101111000101101': 13, '0111100000001010': 2, '11110
00011111000': 2, '1101001110100100': 5, '1101011011010111': 4, '0111110000111011':
5, '0110110011000001': 1, '0000111011100101': 5, '0110010011001111': 3, '01110000011
01000': 1, '0101011100101010': 2, '0100101111100110': 2, '1100001011011010': 1, '011
1110111110101': 1, '1110010111010110': 1, '1101111001001110': 2, '0100111011000101':
1, '0010000110010101': 1, '1101001011110101': 1, '1110100001000111': 1, '01100001111
10001': 2, '1100101111000010': 5, '0000101100001111': 2, '0010110101110101': 6, '001
0010111000110': 7, '0101001100010111': 5, '0011100100010000': 2, '1010000000000100':
2, '0111100011010010': 1, '0100001011011011': 1, '0001010000011001': 1, '00000011101
00011': 7, '0101001000100110': 1, '1111110001001101': 3, '0010000001011100': 9, '101
1110001011000': 1, '1011000110000001': 2, '1100001101110001': 1, '0110110010000000':
1, '0010100100101100': 8, '1101011100011111': 4, '1010100101000010': 6, '01010110001
00011': 7, '1110110001000000': 2, '0010000101111111': 9, '0111100101101110': 1, '110
101011011010101': 1, '0110110011000011': 4, '1010010001010011': 6, '0111000101111100':
8, '0010111001001001': 1, '0111010010111001': 5, '0111110101010001': 3, '01001110001
10001': 1, '1111100000011101': 4, '1000101000001100': 1, '1111010011111111': 2, '001

1010010111110': 3, '1111000010110000': 3, '0011010010101011': 3, '0100001101101011': 1, '0000101001001000': 6, '1001101100101011': 1, '0011000000010111': 1, '1000111000111110': 2, '1111010111001110': 1, '0111000010110000': 1, '0001011010110100': 1, '1101111101011101': 2, '1111110000000000': 28, '1000011000001100': 5, '1100101111001100': 1, '1101011010011101': 6, '1010010111000001': 5, '1000111011111001': 8, '0011110000111101': 5, '0000111111011100': 1, '0111100010000010': 5, '0100011010001111': 2, '1010100100111100': 8, '1010110001101111': 8, '0010110001000111': 7, '0001001110000111': 3, '0101011001101101': 1, '1011110010000110': 2, '1000111111110111': 4, '1110010011000101': 1, '0010100010110111': 1, '1111101000011100': 1, '0010100111011000': 4, '0000101001000000': 7, '0011000100011001': 4, '0001111111000110': 1, '1011100101111000': 1, '1010000001001010': 2, '1101001110100010': 22, '0111110100111101': 10, '0000001011001001': 2, '0101111100010010': 1, '0101101000001110': 1, '0000101101101110': 4, '1110110011100011': 2, '0000111010100111': 7, '1010101101100000': 1, '1001001101010100': 1, '1110100101100011': 1, '1111010011100010': 3, '1101101010011001': 3, '0111110010000001': 4, '1111100110111101': 6, '1111100101111001': 10, '1000011111011000': 1, '1010111001101100': 1, '0111000111001001': 1, '1010110010000010': 5, '0100001111001101': 1, '0010000010101011': 2, '0000101010001101': 1, '1101101110011100': 12, '1101001011011000': 1, '0010000111000000': 5, '1101010000110010': 1, '1010010010010011': 5, '0000001011111001': 2, '1101101010100010': 2, '0111000101100000': 2, '1101111001110110': 2, '0111000000101001': 4, '1101001001110101': 1, '0000001111110001': 8, '1111110001110011': 1, '0111000001101101': 2, '0101101101010010': 2, '1110110111100110': 1, '0000001110110010': 2, '1101110100111011ó': 1, '0000001011011111': 8, '1111000010110001': 4, '0100101100101000': 1, '1101101101101101': 3, '0010000111110101': 6, '0100101101101110': 2, '1111110101111110': 1, '1011010000100110': 1, '0101101101111101': 7, '0101001101100100': 2, '0111100000010000': 9, '1010000011100010': 4, '1000011010111011': 4, '0111110110011010': 4, '1000011011011001': 8, '1010110010010000': 2, '0101011001111011': 2, '0110110111010100': 1, '1111100111010001': 4, '0000101100111011': 1, '1101001111001001': 2, '1100101101100010': 1, '1000101011011010': 5, '1000101011100001': 3, '1000001010011111': 1, '0010100101100010': 5, '0000100111010100': 1, '0100011011100010': 2, '0010010011011001': 2, '0000011011010001': 3, '0100011011010111': 3, '1101001101110011': 3, '1011110010110110': 3, '0010110100101001': 1, '0010100101110011': 4, '1100011001110000': 4, '0101111001111001': 3, '1110000101001101': 2, '1111110000111000': 8, '1101011101011100': 2, '1010111011010010': 1, '1110000011001101': 1, '1101011100001001': 7, '0001110101010111': 5, '1101001100001110': 6, '0001101100110000': 3, '1101011111001111': 3, '1101011101111100': 1, '1111010100110111': 3, '0010010011111000': 6, '0110100110111010': 2, '1001111000100001': 2, '1010010111110010': 6, '0100011001011000': 5, '1111011100011100': 1, '1001011001000100': 2, '0101100110010100': 1, '1000101110010111': 2, '0111100100000010': 6, '1001001100100000': 2, '1101011111000011': 1, '0001101100111110': 2, '1101111110110000': 2, '1100111001101101': 2, '0111000100111010': 9, '0001111010111000': 3, '0111000000011101': 9, '1000101101100110': 4, '0110000111111101': 2, '1010000001100100': 6, '0111100011110110': 3, '0110000111000100': 2, '1010100110010010': 1, '1010000000101100': 6, '1010100100010111': 1, '0111000111010100': 2, '1101011110100000': 2, '0010010000110001': 5, '1000011111110011': 3, '1011000101011101': 2, '0101111010111000': 3, '0101011001100000': 1, '0001001110001100': 1, '0010010010000010': 7, '1000001110010011': 1, '0100111001110100': 1, '0010110011011001': 6, '1000111111000111': 5, '1111000111110000': 2, '1010110000110010': 1, '1010100100000101': 2, '1010100101111010': 4, '1010111000110001': 1, '0001011111010110': 1, '1010010111011000': 1, '0111010111101010': 2, '1000111111011001': 10, '0010100000111001': 1, '0101001111010010': 8, '0111000001111101': 2, '1111010001110110': 2, '0100111001001101': 2, '0101001100111010': 5, '0101001100011111': 4, '0010010000010001': 3, '0101111110110111': 9, '1011100001111011': 1, '0011000110111100': 1, '0000101111001000': 3, '1110100101100000': 2, '0111110010000010': 21, '1111110110110010': 6, '0101111100011101': 2, '1010000111010100': 7, '0111010110100010': 3, '0111110100111110': 2, '0111100000000010': 3, '0010110001110011': 6, '0010010101001010': 4, '0001111010100101': 1, '1000101000101000': 2, '0101001010100110': 6, '0101111101110101': 4, '0010010110100010': 3, '1010000010111100': 1, '10101001110100

00': 5, '0101111010000000': 5, '0101111010111001': 9, '0111010110101111': 4, '111010
0111001111': 1, '0100101111111010': 1, '0000011111110100': 1, '1001001110101010': 1,
'1111010101111101': 3, '0000011101010100': 8, '0000111010010110': 4, '11011111100101
10': 5, '0111000110100001': 5, '0110000001101100': 1, '1000011001001010': 12, '10000
10111011011': 1, '1011100100101111': 1, '1111100100010111': 9, '1101101111010001':
3, '0000001111010100': 6, '0010010011101101': 8, '1101011100000010': 1, '10000111110
10110': 8, '0010100000011000': 4, '1001011010001110': 5, '0110000111110110': 5, '100
0001111100100': 3, '0000001100101101': 3, '0100111000010001': 1, '1111011010111110':
1, '1101100010111010': 1, '0101011101011000': 2, '0001011010100110': 1, '01110000101
00010': 8, '0001001100111100': 1, '1011000111011010': 1, '1111100000100101': 5, '000
0101100101001': 3, '0101101001001001': 1, '1011010111001110': 1, '0111010001000001':
2, '1000111111101110': 9, '0000111011100100': 6, '0101001001011100': 2, '10000100000
00001': 1, '0100111101110010': 1, '0000111100110100': 1, '1010110000110100': 2, '000
1001100110000': 2, '1011000111010010': 1, '1110110111011011': 1, '0101001011101010':
2, '1011100100110000': 2, '0000110001001100': 1, '1000011011010100': 4, '10001110000
11101': 4, '1111110100001101': 4, '0000100001111010': 1, '1010010110010111': 1, '110
0101101011101': 4, '0100111000100000': 1, '0000011100110100': 4, '0000101011111100':
3, '0010010001010010': 7, '0000101011000101': 1, '0010100101111010': 9, '11011111111
00110': 3, '0010010010001001': 4, '0111000001111000': 1, '0111010110110010': 6, '100
0101011000000': 2, '1101011100000101': 4, '0000101001100111': 2, '1000001101010010':
3, '0001111001001101': 2, '0100001110001010': 1, '0001001110010111': 6, '11011111000
10000': 6, '1010010111000110': 7, '1111010010010100': 5, '0101001010110010': 6, '011
1010001000011': 1, '1101101101111001': 6, '0101011001001110': 2, '1000000011100110':
1, '1101111110011101': 1, '1000111011111000': 8, '0100111001011100': 3, '01010111001
00111': 1, '0000001100001000': 3, '0101111110110010': 3, '0010010000010100': 2, '000
1011011101111': 2, '0110000111111011': 2, '1100101111001010': 3, '1100011001001000':
2, '0111000100101110': 6, '0101001100111111': 6, '1010110100101100': 3, '10011011101
01101': 1, '0010100100010110': 2, '0100101000110000': 1, '0101011111111111': 1, '010
0101100011001': 2, '1111000000110010': 2, '1001101111110110': 1, '0011000110001110':
2, '0101111011110000': 4, '1010110011101100': 3, '0010000100011000': 6, '01111001001
10001': 16, '0111110000000110': 4, '0101011011000111': 5, '0101011000010001': 24, '0
100001011100100': 1, '1101101111111001': 2, '1010000001010101': 6, '011110001010011
1': 6, '1010100111101000': 6, '1111010100101101': 3, '1001001110111100': 2, '1000111
000001011': 1, '1001101100111100': 3, '0001011010100101': 3, '0111000010100001': 2,
'0010010111000011': 5, '0101001100010010': 4, '0100001111101110': 2, '00000100110110
01': 1, '1110010001101011': 2, '0000101111100101': 6, '1010110110000101': 1, '100000
0100011000': 1, '1010010111110110': 5, '1110010000000101': 1, '0110110100101100': 2,
'1000001111000001': 6, '0010000100001001': 9, '1111100001101101': 1, '10110001110100
11': 2, '0001001100110001': 3, '0111100111100110': 1, '1110100111010011': 3, '101010
0001011000': 7, '1101001101001000': 5, '0111100001111100': 2, '1111100100100010': 5,
'1010000100000001': 5, '0010100001011001': 6, '1100111001000110': 2, '00101000111101
11': 11, '0110100101001001': 2, '0101011111011111': 2, '0111000110110100': 4, '10100
10111101000': 2, '0011010001010000': 1, '0111100000011101': 4, '1010000011101111':
5, '1010101111100010': 1, '0111110100101100': 7, '0101001010011011': 11, '1000001110
101110': 9, '1100011111111001': 1, '0111010000010111': 4, '0001111010110011': 1, '11
01101101110100': 12, '1101011100110111': 1, '1100001011010110': 1, '011001001000011
1': 1, '0000001100111001': 5, '1000101001011001': 5, '1111011010100010': 1, '0110100
110010100': 2, '1111100111001111': 3, '1110100111111000': 1, '1000101010100110': 3,
'0000101011111010': 4, '0101111000100110': 5, '1001011001010101': 1, '11101001111011
11': 1, '0000011010111011': 4, '1011100111001111': 1, '1010110000001101': 7, '111110
0000100000': 5, '1001011000010110': 1, '1111000110101000': 3, '1011110100110110': 1,
'1111100001011101': 2, '0000100101001000': 1, '0111110001001001': 2, '10011110010111
00': 2, '1011110010000010': 1, '1010100010010011': 2, '1101111101100000': 1, '000100
1101101110': 1, '0111000110101000': 2, '1111110100100110': 2, '1101111010011000': 6,
'1111110010110101': 11, '1001011010001011': 2, '1101101001101000': 2, '1110000101110
111': 2, '1110100011111010': 1, '0000011111001001': 3, '1111010001100000': 2, '11011

11101110100': 2, '1010010101001010': 4, '1101010001111001': 1, '0101111110001010': 4, '1000111111010011': 6, '0000001011100110': 7, '1000011101111100': 6, '0010000011100101': 2, '0000001110000101': 2, '0010000011100000': 3, '0000001110000000': 3, '0110100000111100': 1, '1100101100100101': 1, '1111001100010000': 1, '0111000110101010': 20, '0000001000110000': 1, '1111000111010110': 9, '1111100000010101': 8, '0101111110000110': 5, '0101001101011100': 7, '0010100001100011': 1, '1101111100011000': 3, '1000011001000111': 6, '1101111010000101': 7, '1101111110011001': 1, '1010010101111001': 4, '1111000010000100': 3, '1000111010110001': 1, '1000101100110000': 8, '1001001110000011': 3, '0010110001011010': 7, '1101111011011111': 5, '1000111101101010': 2, '1000001111001011': 20, '1111011000111101': 1, '0011010010100111': 1, '0100011101100101': 1, '1100001111101000': 1, '1011000100001001': 4, '1101100010011110': 1, '1011000000000000': 1, '0111110011111111': 6, '1111010000111010': 7, '0101001101100000': 4, '0111010101111100': 1, '1000101001101110': 2, '0111110001111010': 1, '1110100101011100': 2, '0000011111110111': 4, '0010000111110001': 6, '1101001010101001': 4, '0111010001011111': 1, '1101011000100110': 7, '1000111101010011': 1, '1111000101111000': 7, '0110010001010011': 1, '0101111111010000': 1, '0010110000001010': 1, '1101111011001101': 3, '1000101110000010': 5, '0010000000110110': 1, '0101011011010111': 7, '0000111101001101': 6, '0010000011000100': 2, '1101011101101110': 2, '1011000110001011': 2, '0101101100110111': 7, '0110000101011101': 3, '1101011010101001': 5, '1001111101001110': 1, '0101101110100110': 20, '1000111000110000': 6, '0010100001001111': 2, '1111110100100000': 6, '1101101010111111': 6, '0000011000000100': 2, '0001111110000100': 1, '1110000111001011': 1, '0000111101111110': 3, '1100011001010100': 2, '0100101111001111': 4, '0000001101001110': 5, '1101011110100110': 5, '0000001100101111': 2, '1101011001010101': 7, '1010110010111111': 2, '0010100001000010': 1, '1111110100101101': 5, '0101111000001111': 3, '0110010111011000': 1, '1010110001111010': 3, '0100011011000010': 3, '1010100001001011': 6, '0000001100010001': 6, '0101011001100101': 2, '0000011000101000': 7, '0001001110001111': 1, '1010010010100010': 8, '0001011000101000': 2, '1101001001110000': 1, '0111000101100101': 3, '1101111001110011': 1, '0100001111000101': 1, '1001111011111100': 1, '1010110010001100': 2, '1000011111101111': 4, '1111100111100110': 5, '0111000110100000': 4, '0000011011111000': 6, '0100001101011001': 1, '0000011010110111': 5, '1010110000000001': 5, '1010100010001111': 2, '1000001100100001': 8, '0010000111000011': 16, '1001111110010011': 3, '0110100011111011': 1, '0000001010101010': 2, '0001001101101101': 1, '0111000110101001': 5, '1000111010001011': 3, '1011010010010110': 3, '1011000011101111': 1, '1010110010111001': 1, '0111000011010110': 2, '1111110110101111': 7, '1001011010101111': 2, '1001001011100110': 1, '1000101111111000': 5, '0000110001101101': 2, '0111110010111000': 6, '1110010111010011': 1, '0100011010000111': 1, '0000011000001001': 7, '0000011100000000': 1, '0111010000001011': 5, '0010111011111011': 1, '0010000110100111': 10, '1100001101110011': 1, '1011000110000011': 1, '0011010011101011': 1, '0010100000101000': 2, '1101001000010101': 3, '0111010100101100': 3, '1010001011111111': 1, '1101010000111101': 2, '0001011111101111': 1, '0110111001011001': 1, '0100101110110010': 1, '0001011110101010': 1, '1100101011011111': 1, '0010110011011100': 6, '1010100011010010': 6, '1111110001111010': 1, '1010011011001111': 1, '0010000100010110': 3, '0010001011111011': 1, '1101011000001111': 7, '0101111111011110': 3, '1111010110101011': 4, '1101011111100110': 1, '1010000110110001': 2, '0001001111011010': 2, '0000110110101010': 1, '1101001111111110': 4, '1101010010000011': 3, '1000101101101010': 10, '0111000000010011': 1, '0000101001010001': 1, '1000001101000010': 3, '0100111001010000': 2, '1010110111011010': 9, '1000001010000010': 4, '0111000111010110': 5, '1011100000111001': 1, '0000111001011110': 4, '1000011101001111': 3, '1101101100010011': 7, '1110000101001111': 2, '0011110010101010': 4, '0010100000111010': 1, '0110100110000101': 1, '1101011110000001': 1, '0101111010011101': 5, '0011110011000110': 2, '0001001110111110': 3, '1111010111101111': 2, '1101101111001111': 7, '0011010010100110': 2, '0000001010001000': 2, '0101110010010010': 1, '0111110001101001': 2, '1010110010000000': 2, '1001111011110000': 1, '0100001111001111': 3, '1001111110111100': 1, '0010000110001100': 4, '1101111111001111': 8, '1000011000111100': 4, '0111000001001010': 3, '0000011101101101': 5, '0000111001101111': 8, '0010000011010000': 1, '0000001110010000': 1, '10010110010

11000': 2, '1010010111011111': 5, '1000000101111101': 1, '0100001110100010': 1, '100
0011011101100': 6, '1010000011101001': 6, '0100001001011000': 1, '1111100111100101':
2, '1111100101101001': 2, '1011110011001000': 2, '0011000111001110': 2, '01001110110
00011': 6, '1001001001110000': 1, '0101100110010010': 2, '0111111000011101': 1, '110
0101111010000': 1, '1010000001010111': 1, '0111100010100101': 1, '1010000100111000':
3, '0010010010100010': 7, '1010010011000000': 5, '0000000101000100': 2, '01010011001
01100': 17, '1110100111100001': 1, '1000101011110111': 3, '1000001111000011': 22, '0
010000011000000': 2, '1001011000101000': 2, '1000101010100111': 2, '111010011111100
1': 1, '1100001101011010': 2, '1101101010010111': 10, '0101001101011010': 1, '001010
0101110100': 16, '1011010101110011': 1, '0111000111100110': 6, '0000001111111111': 2
2, '0101111100110110': 1, '1110000101101110': 1, '1111110110110101': 2, '00101000111
01100': 2, '1010110010100110': 3, '1110000111111010': 2, '1100001110101111': 1, '100
0011111110010': 5, '0010010000110000': 4, '1001011110111110': 2, '0111111010010111':
1, '0010110000111101': 5, '0010000001010111': 2, '0101001101101000': 8, '10001111111
11111': 9, '1101001001111101': 2, '1100101111010110': 3, '1101101100101111': 8, '010
1010010110011': 1, '0011010000111101': 2, '1010010011101100': 6, '0111110100001001':
10, '0001111000010101': 3, '1010110101111010': 1, '1010100100011101': 3, '1111100101
010101': 3, '0101001111011111': 5, '0101111010011000': 7, '0100011101010001': 1, '01
01111110000100': 4, '0101111001000100': 6, '0010000001111100': 7, '011101000100010
0': 3, '1011000000010101': 1, '1010011010100010': 1, '1111110110100101': 3, '1100011
011111001': 1, '0000101111101001': 6, '0101101111000110': 3, '0000000001100000': 1,
'0011000110111000': 1, '1011100001111001': 1, '0101111100101101': 6, '00100001111011
01': 4, '0111000111000000': 2, '1010100110110101': 1, '1111100111010011': 11, '00110
10110101110': 1, '1111001010011010': 1, '1011010000000000': 4, '0111100011101101':
1, '1010110001110010': 3, '0000011000111100': 2, '0100011001111110': 1, '00101001010
11010': 6, '0010010000010111': 4, '0111001110110110': 1, '0101111110110001': 1, '000
0011111101000': 2, '1101111111011110': 1, '1111010000111000': 22, '011111000101111
1': 3, '0111100101001100': 2, '0111000100101011': 4, '1001101001100100': 1, '0000001
000001100': 3, '1111010110101001': 1, '0101101111110110': 7, '1010010001011010': 5,
'0101011101111100': 1, '1100101011011011': 1, '0111100010111100': 2, '000010100010010
01': 1, '1000001100011000': 5, '1111000010111010': 4, '0010000011000110': 6, '010100
1011111011': 1, '0100011111000001': 1, '1100010001011001': 1, '1101111010010101': 9,
'1011010010100010': 2, '0111100001010111': 2, '0101001101010101': 6, '01110100000011
10': 4, '1100111001111001': 1, '0000111111101110': 1, '0101111100010101': 4, '011000
0101110001': 7, '0011100000111111': 1, '1111010110011111': 4, '0111010011011001': 2,
'0010100110001010': 3, '0111010011000010': 3, '0101101110101000': 5, '11010100100010
11': 1, '1111100101101010': 2, '0101011011100110': 6, '1010000011011111': 6, '001100
0110001111': 3, '1101101001011001': 1, '0111010110000011': 5, '1000111100110000': 1,
'1101011010000101': 7, '1011000110100111': 1, '1000111101100110': 1, '010110110111110
10': 3, '0010000001010001': 5, '0001111010010101': 1, '0110110001100001': 2, '100010
0111101101': 1, '1001001011001010': 1, '1101111100011110': 3, '1010000001110011': 3,
'0110110001001101': 2, '1111100011101000': 1, '0111110010001100': 6, '10101100101100
11': 5, '1010010111101101': 4, '0011000100011000': 2, '0000110011101110': 1, '001111
0110101100': 1, '1000111101110111': 1, '1010010111010110': 8, '0000110011000010': 1,
'0101001000011101': 7, '1010110010100100': 4, '1101111000001000': 13, '1110000111011
110': 1, '1010000011111110': 9, '1010100011100010': 6, '1101011110011000': 2, '01111
10110001110': 6, '1101001111100000': 1, '0100001111001011': 1, '0000111011111001':
3, '1001111011110100': 1, '1010110010000100': 1, '0101111100010001': 5, '01010010101
00011': 8, '0000101100011111': 3, '0001011011010010': 3, '1110000011100011': 1, '010
1111001000101': 3, '1000001100001111': 3, '0110010010110111': 1, '1010010000010011':
1, '0101001111001111': 5, '1000111000101101': 9, '0111010000111111': 4, '10101000011
00111': 1, '1011010100101101': 3, '1111000011101011': 3, '0001011001010011': 1, '111
0000001100000': 1, '0111000101110100': 11, '0111110110111000': 1, '101000011000110
1': 1, '0100010001100000': 1, '1001111000111001': 2, '1001001110101110': 1, '0011100
001101001': 1, '1101110000000001': 1, '1101011001001100': 3, '1101111110101000': 2,
'0001011000111010': 2, '0111000000111110': 1, '0101001010010101': 2, '10100000110111

10': 5, '1101010101010000': 1, '1111010100100110': 1, '0011100010000110': 1, '001011
0100001100': 1, '1100001010001011': 1, '1110010011111101': 1, '0101110001110000': 1,
'0000011000110110': 1, '0100011001110000': 2, '0101010001111001': 1, '01111011111011
11': 1, '1110010011101000': 1, '0000010001011010': 1, '1010110011000011': 18, '00010
11000011001': 5, '0001101101110011': 1, '1101011101110100': 3, '1010000000100100':
1, '1100011101011000': 1, '0110010001101110': 2, '1111110001011001': 2, '00101000111
00110': 2, '1111101100001100': 1, '1000001110011011': 3, '1000011010100101': 1, '100
0111001001110': 7, '0110010011100011': 4, '0010100000101011': 2, '1111110100100111':
2, '1000001110110101': 1, '0101111001011010': 5, '1010100100100101': 3, '10101100000
10110': 2, '1011100110110000': 1, '1111010110110011': 5, '0101011010010100': 5, '111
1110110101010': 9, '1101001111000110': 9, '1000101001111001': 3, '0010000000111011':
1, '1000011000101110': 3, '1111110000100010': 3, '1010100110011010': 2, '11000011010
10001': 2, '1111100000001100': 2, '0000111101001100': 4, '1100111000100000': 1, '010
0101111001110': 2, '0010110010001101': 2, '1111100010111111': 14, '010110111011010
0': 6, '0101001110011011': 22, '1111110011000101': 1, '0000111001101100': 33, '00000
11101101010': 1, '1111001010100111': 1, '0010110001001110': 6, '1101000110101011':
1, '0010100010001111': 4, '0110110011010101': 1, '1111000111111010': 5, '00101000010
11000': 6, '1000001100111100': 3, '1010110101010110': 3, '1110000101011100': 1, '110
0001100011001': 1, '1101001101001110': 2, '0011000000110001': 1, '0010000001010110':
1, '0011010000000111': 2, '1111000001110101': 1, '0011010110000110': 1, '11001010010
10101': 1, '0010110111011101': 1, '1100011001000101': 3, '1000001101000111': 9, '110
0101101001100': 3, '0000101001010100': 3, '0010100110110011': 1, '0101001001100001':
1, '1111110011001000': 2, '1000011101001100': 8, '0000110011011111': 1, '11011010110
10010': 2, '0101111000110010': 8, '0111111010110011': 1, '0011010000001110': 1, '100
0111010010111': 2, '1001101110000100': 2, '0111010100011011': 2, '1101101010101110':
5, '1010100011110111': 6, '1001011000100111': 1, '0101100010011000': 1, '00001111001
10000': 2, '1011110100000001': 1, '0010010000111001': 1, '1100001101100001': 3, '000
0011100101011': 1, '1000011110011110': 2, '0111010111100001': 1, '0110110010000100':
1, '1101001010110101': 3, '0110000110011010': 1, '1010010000011001': 4, '00000011110
10000': 4, '1100001110101010': 1, '1000011111110101': 4, '0010010000110111': 1, '111
1100110001010': 16, '0010000101101010': 5, '1000101111011101': 3, '100000111001111
0': 1, '0101111101110100': 4, '0010111101010100': 1, '0101111111000011': 3, '0010010
000001001': 3, '0111000101000101': 2, '1101001000010000': 5, '0001001100001000': 2,
'0111100000001100': 6, '0010010011100111': 17, '1111000001101101': 1, '0101001110000
000': 2, '0100111011011111': 4, '1001111110011001': 1, '1101001011010001': 1, '00100
00111001001': 3, '0101011010110100': 6, '1101011011100101': 1, '0001001101100101':
1, '0101101100001010': 5, '0101111010000100': 3, '1010010000001101': 5, '00000110011
10011': 4, '0011100111101101': 1, '0101101100001011': 4, '1101101000101001': 6, '011
1000110110001': 5, '1101101101001000': 4, '1111010010000000': 6, '0101011011000001':
2, '1011100100100000': 1, '1111100100011010': 5, '1111000000110100': 11, '1010111001
111001': 1, '1111110100001000': 3, '0010010011010000': 2, '0000101011110101': 1, '00
00111110000010': 2, '0101011101010001': 1, '1101101111011111': 1, '101110010010000
1': 3, '1110010011100011': 1, '1010010101000101': 4, '0101001111110110': 7, '0011100
101111001': 1, '1111100010100011': 6, '0111100110010101': 10, '0011010000011100': 3,
'0111110110000011': 2, '1101001111101111': 8, '0111010110101001': 2, '01111000000110
00': 4, '1110110001010100': 2, '1011010100011100': 1, '1011100110011110': 1, '111101
0101010001': 6, '0101001101011101': 4, '1111110001010100': 3, '0001011100001101': 1,
'1101101000010010': 2, '0101001111111010': 2, '1010110100100001': 1, '10011011101001
10': 2, '1101111010110001': 5, '0010110000110010': 1, '1101101000100000': 4, '111110
0111111101': 2, '1011110000111110': 2, '1001011110010010': 1, '0011010010100100': 3,
'1101111010111100': 5, '1100011001111010': 1, '0010110011101100': 7, '01011011110100
00': 2, '1010000011001010': 7, '0101011011001000': 1, '0011010010011000': 1, '111001
0111110010': 2, '1111101110010001': 1, '0011110100101010': 2, '1000011000110001': 7,
'1100101111011010': 3, '0001111000100110': 3, '0100111001011011': 1, '11010100100100
11': 1, '0001011010011001': 2, '0101011011010011': 6, '0111010110010001': 1, '111110
0101111101': 3, '1111010101001010': 1, '1100001101111100': 2, '1010110011110110': 1

5, '1001111010000110': 2, '0101011100001000': 8, '1100001111110100': 2, '00101001100
10010': 3, '1010010110010101': 1, '1101001010101110': 5, '0001111100110100': 1, '111
1010110111010': 4, '0000001100110000': 9, '1000111111110110': 5, '0010010101001101':
5, '0110010001010110': 1, '1100111001010110': 1, '1010010001000010': 7, '00010110010
11110': 1, '0111010010111000': 3, '0111000101111011': 3, '0010110111010001': 1, '101
0100001110100': 5, '0101001111011011': 6, '0101111111101011': 1, '1110110010101000':
1, '1000011100011100': 2, '0111001110011011': 1, '0100011001000001': 1, '00000110010
00111': 6, '0111110111011111': 3, '1111100001100000': 1, '0001001100111110': 1, '101
1000110001010': 1, '0010100110000110': 7, '0100011001101001': 2, '1011100000011000':
2, '1100001100010010': 1, '1000111111100110': 12, '0100101111001011': 1, '1001011000
100001': 3, '1011100010110010': 1, '0000111101000000': 5, '0101011110010011': 8, '10
01111100000101': 1, '0100001101001101': 1, '1111010001011011': 4, '011101001111110
1': 1, '0001011010110000': 2, '1111100010100010': 5, '0000011010011010': 4, '1101111
100111110': 4, '1001001001110001': 1, '0111110111110010': 3, '1001101100111101': 2,
'1000111000001110': 1, '1101001111101000': 2, '0000001100111100': 1, '11110101101100
10': 7, '1111100110010001': 2, '1010100001001001': 6, '0011110000100010': 1, '111000
0111100011': 3, '0101011111101010': 1, '0010000100110111': 1, '0101001100000111': 8,
'0010010111010000': 1, '1010010101101100': 14, '1111000111110001': 1, '1000101011110
100': 2, '1110100111100010': 2, '0110000011011110': 5, '0000001111001010': 22, '0001
101000010000': 3, '0001111000101001': 4, '1000111111001011': 8, '0110010001100001':
2, '0001111001111010': 1, '0111111000101101': 1, '0111110000111010': 8, '01111001011
01101': 1, '1101011011010100': 2, '1111010110001010': 5, '1100101100001001': 2, '000
0101011011010': 3, '0111010110111000': 3, '1110000111001100': 1, '0001111000000010':
1, '0010110010011011': 4, '1100001111110001': 1, '0000011000001110': 3, '11110100100
01100': 4, '1110010101010000': 1, '1100111000101010': 1, '0100101111000100': 2, '111
1110000011101': 25, '1111110100111101': 10, '1010010111001111': 7, '101010001110010
1': 3, '0111000001110001': 3, '1010010100000001': 2, '1000111011101001': 3, '1111000
010010110': 3, '0001001100110101': 2, '1100101101010101': 2, '1010000111001111': 17,
'1111000100000010': 3, '0111111011000010': 1, '0001001110110011': 1, '00111001010100
01': 1, '1111100101111000': 12, '0001001110011010': 1, '1101001111100011': 1, '01111
10110001111': 2, '0010000011110101': 1, '1100011111000111': 1, '0011010010111100':
1, '0000101011001000': 2, '1101101111001110': 4, '0010010010000100': 2, '10011111110
11010': 1, '1110000110111101': 1, '0111111100011101': 1, '1000011010000110': 7, '000
0001110000100': 2, '0110100101101111': 1, '0010001111101010': 1, '0110010001011011':
1, '0100011010010110': 2, '0111100010101110': 6, '1101000101110101': 1, '01001110010
10011': 2, '0101011111011110': 2, '0010010111111101': 3, '1010100001011111': 1, '111
1110011010011': 7, '1111110100110001': 9, '0001101100100101': 1, '1000011010111111':
2, '1010100001111101': 1, '1111110100010000': 9, '0101000100111101': 1, '01001110111
11000': 2, '1110100100010110': 1, '0111010100110110': 2, '1100011001111110': 2, '101
0100101001110': 14, '0111000110010010': 22, '0000011000010001': 5, '111100010111110
1': 6, '1111100110111001': 7, '1111000000110111': 2, '1000011010001101': 3, '1111000
101010010': 2, '0110010001110101': 2, '1001001111100001': 1, '1111100101100011': 2,
'0011100100101000': 3, '0010110001010011': 5, '0011000110010110': 2, '10001011001110
11': 1, '1001001110001010': 3, '0000001000001001': 1, '0000101010011100': 1, '100011
1000111100': 2, '0101101010010100': 2, '0101111011101101': 2, '1001101100010011': 1,
'0001111011111111': 1, '1000111111010110': 6, '0000011101001110': 1, '100001110111111
11': 4, '0000001011100011': 3, '1011010010001011': 2, '1010000010010100': 2, '011010
0110100110': 2, '1101011100101110': 2, '1100001011001111': 1, '0101111111110011': 3,
'0110000111100110': 3, '1110110011111010': 3, '1111001110111000': 1, '11011110000111
10': 10, '0101101110010001': 5, '0101111011101000': 1, '1111101110101111': 1, '11000
11010100001': 1, '1000100001011001': 2, '0100011111011110': 1, '0101011110011001':
4, '1000011000001101': 9, '1101111101011100': 1, '1111110000000111': 6, '10100100000
10110': 2, '0100011011111111': 3, '0101001010000111': 1, '1101101010110001': 2, '000
1001000001100': 2, '1000101001101010': 1, '0111110001111110': 1, '1111010011011101':
1, '0000010101001010': 1, '0001111000111011': 2, '1001011000110101': 1, '01010110110
00110': 6, '1001011110001111': 1, '0010010010001101': 1, '0111000000110010': 2, '000

1101100010000': 2, '1010000110011010': 2, '0101011000000010': 4, '0111110110101010': 4, '1111110010110000': 5, '0000011111011000': 3, '0111100011001110': 3, '1100001110101000': 3, '0010000000011101': 1, '0111100101110000': 4, '0010000011110000': 2, '1110010111111010': 3, '1111010110111000': 4, '0110010001000100': 1, '0000000001100001': 1, '0111100000111011': 3, '1101111100000010': 1, '1111000100101010': 5, '0000111111100011': 6, '0111110111110100': 2, '0001111000111100': 3, '0001011001110000': 3, '0101001111100010': 8, '0010010101110011': 2, '1100111011011110': 5, '0100111101001000': 1, '0100011111011010': 1, '1000001100100100': 3, '0110110001100000': 5, '1000111100001000': 1, '1110010000010110': 1, '0110010101110000': 1, '0000101011000100': 1, '0100011000010101': 1, '1010100001001111': 1, '1000001100110000': 4, '1111110011000011': 3, '0101001110011101': 3, '1110000111000000': 1, '0000111110101000': 1, '0001111000001010': 2, '1010100100110011': 1, '1010110001100110': 2, '0001001010001110': 1, '1000011000100000': 4, '0101111111010111': 3, '0111101101110100': 1, '1111110111100000': 1, '0000001100010010': 1, '1010100110001010': 3, '1101101000101000': 6, '0100101111011101': 1, '1000111011110001': 2, '0101101010100111': 5, '0000111101011101': 7, '0010000001000001': 4, '1010010011111001': 8, '1111010100011010': 1, '1001111000011000': 3, '0010010110101111': 2, '1111000000000010': 1, '1010110101101001': 5, '1001101111100110': 1, '1000101101001011': 10, '0110010101000011': 1, '0111000010011000': 2, '0111100011001011': 1, '0000111000001010': 1, '1101001111110101': 3, '1010100110000010': 6, '0000111110010010': 2, '1000001000110110': 2, '1011010010110001': 1, '0101011110111000': 4, '0000111000101100': 4, '1101101010011010': 7, '1100001111110011': 2, '1000011110111110': 1, '1010110111100100': 1, '0000101110000100': 2, '1100111011110011': 2, '0110110101001100': 2, '1000001111010011': 19, '1001111010000000': 2, '1010110011110000': 4, '1001111000010010': 1, '1000101110101000': 2, '1000001011001111': 9, '0000001110110001': 1, '0111000101111101': 9, '0010011010110011': 1, '0101011000100010': 3, '0110100001100010': 1, '1101101010111010': 5, '0000111111010110': 4, '0011110000110001': 2, '1001111000111100': 2, '1010000010000111': 3, '1101001011101111': 1, '1110100011000010': 2, '0111100111011000': 2, '0000011110111110': 1, '0010010000111000': 3, '1111010100111001': 2, '1100011101011101': 1, '1111100101001111': 1, '1111000101100000': 1, '0110010001101001': 2, '0100001001010101': 1, '1010000011100100': 1, '0101000000110000': 1, '0000111011101111': 28, '1000111000100010': 2, '0111000011010010': 2, '1001111000000000': 1, '0000111111000110': 8, '1011000101010110': 2, '1000001111000000': 8, '0111100011101011': 3, '1111000111010101': 3, '1100101101010001': 1, '1010010101011101': 3, '1000000111111011': 1, '0111100111010101': 1, '1111111110110011': 1, '1011000110010010': 1, '1111101110111110': 1, '1001011100011101': 1, '1101101010000100': 1, '1000101000001000': 3, '0111000000010100': 7, '1000101101101111': 2, '0001011000010000': 2, '0001001110101101': 3, '0111000111100000': 2, '0100011111111010': 1, '0000101010101000': 1, '1000011111000100': 1, '0001001101111100': 1, '1001111000000100': 1, '1000011111001101': 1, '1111110001100001': 1, '1000101110101100': 3, '1101011011100010': 1, '1010100011011000': 5, '1111110101110001': 3, '1010000001111000': 3, '1011010000101011': 1, '1101001111010010': 5, '1111000001011101': 4, '1101011101100000': 1, '0011100100111001': 3, '0010010101001110': 3, '1111110110101101': 3, '0101110010000001': 1, '0111100101001001': 4, '1111110011111111': 2, '1110010011101110': 2, '1011000100100100': 3, '1111010000110011': 4, '1001001100011001': 2, '0101111001100001': 1, '1111110101101101': 2, '1001010010001111': 1, '0001111111010011': 1, '1000011011101000': 5, '0000001111000000': 1, '0101111100001001': 3, '0000101110101100': 3, '0010010111010001': 1, '0101001100000110': 11, '1111110001100101': 2, '0010111010001110': 1, '1111111100100101': 1, '1010000110110010': 1, '0000001011111101': 1, '1111110010101110': 19, '0010110010100110': 5, '0101101001011001': 1, '1101001111001011': 5, '0000101100111001': 3, '0110010001001010': 2, '0101101110001100': 8, '0001011010101100': 2, '0101100111101010': 1, '0111010011000100': 2, '0001111110100110': 1, '1100011010000111': 2, '0111110110010001': 1, '1000111000011001': 4, '1010110110100111': 1, '0000001010001110': 4, '1111011000111000': 2, '1010000110000010': 3, '1001001110100011': 1, '0111000000000011': 1, '1000001011011101': 1, '0000101000010001': 3, '1100001100010110': 1, '1000111111100010': 4, '0111000000010010': 1, '0001011000010110': 1, '0001101110110101': 1, '0001011011010011': 1, '001110010011100

01': 4, '1011110010110111': 2, '1101111110111000': 2, '0101010000000111': 1, '010001
1001101000': 3, '1000000101111100': 1, '1010010111011010': 7, '0000111000100001': 6,
'0110110111010101': 1, '0101011001111100': 6, '1000101011010111': 4, '001010001010101
10': 6, '0000101010101011': 1, '0011010010110011': 3, '0101100100010111': 1, '000010
1001000001': 8, '1000001001010111': 2, '1111000010000010': 9, '1000111010110111': 1,
'0111010111101100': 1, '0001101101011000': 1, '1001100110001110': 1, '01010011101000
00': 3, '0000101010000010': 2, '1101111110011000': 2, '1101111010000100': 3, '100000
1011001101': 1, '1011010100101000': 1, '1011010001100001': 1, '1000011101011101': 6,
'1111000110110101': 7, '0001101100100000': 2, '0001011001000110': 1, '11010011001010
11': 2, '1100111001010100': 1, '1000101100101011': 3, '1000001000110101': 2, '000000
1111101101': 2, '1000011000101010': 2, '1111110000100110': 6, '1101011001000100': 3,
'0110010011010101': 1, '1011100110101100': 1, '1101001100111110': 3, '010001010111001
11': 3, '0110000111001100': 1, '1101111110011111': 5, '0101111110110101': 1, '001111
0101010010': 1, '0101111100110000': 6, '0111011010100111': 2, '0111100001111110': 1,
'0110000110000010': 1, '0111110110010111': 8, '1010110010011111': 2, '11011111010101
10': 1, '1000011000000001': 4, '1111110000001011': 6, '1100111001110011': 2, '110100
1011111100': 1, '0110000111111111': 1, '1100101111001110': 3, '1000111010011010': 2,
'1001101110001011': 1, '0111010100010100': 6, '0101111001011111': 4, '10000011101100
10': 3, '1101101011101010': 2, '0010101101100001': 1, '0100001111001100': 1, '101011
0010000101': 1, '0000111011111000': 5, '0111000101000100': 3, '1101001000010001': 8,
'1110010001011100': 4, '1010010110101111': 2, '1100011011111010': 7, '10001011000101
00': 9, '1010000110110111': 5, '0000001011111010': 4, '0010001111101111': 3, '000010
1011111110': 7, '1010000000011101': 3, '0111100011101111': 1, '0011010000000101': 2,
'0010001110010010': 1, '0000010001000110': 1, '0100101110000010': 3, '11010011110100
01': 1, '1100101101111000': 1, '1111000111001110': 4, '1111010010001001': 7, '000010
1110110010': 9, '1001101110110111': 5, '0101101011010010': 1, '0000011001000000': 2
4, '0010000011111110': 6, '0001011010100001': 3, '0111000010100101': 2, '11111000101
01110': 7, '0001001111110010': 1, '1001011011011111': 1, '0101101100101111': 6, '000
0011101101001': 3, '1101111100000100': 7, '0001001000111011': 1, '1011100000011100':
2, '0110000111000000': 2, '1001111100111000': 1, '1011110001110000': 2, '11011100100
11101': 1, '1111000010111101': 1, '0100110101001110': 1, '1111100111110100': 1, '111
1100101010110': 1, '1100101001111100': 1, '0000001111110101': 5, '0000001111101001':
4, '1010010000100010': 1, '1101010101011100': 1, '1111000001110010': 2, '11001111111
11011': 2, '1000111101000011': 1, '0111100111010001': 2, '0101111011011110': 5, '001
0110000011101': 4, '1101000100100001': 1, '0100001100011110': 1, '1001011000111001':
2, '0000011110000100': 1, '1011000100111100': 1, '0100011000000011': 1, '10101101000
00000': 1, '1101101101011100': 5, '0110000111010010': 5, '1010110111101110': 10, '00
00101110001110': 3, '1111010001111001': 6, '0111001100001101': 1, '0000001100100000
0': 4, '1100101110000001': 1, '1101001111100110': 4, '1010000111110101': 2, '0101111
011011000': 2, '0001101000110101': 1, '1111011000100100': 1, '1010000110110110': 3,
'1101001011110111': 4, '0001011010001110': 2, '1111110111011011': 3, '10100100010101
11': 4, '0110010001110010': 1, '1111000101010101': 4, '1000011010001100': 1, '011101
0110011111': 3, '1110010101100100': 2, '1101001000111101': 3, '1001001010100011': 1,
'1101011101111110': 1, '1111010100110001': 5, '0111010011010100': 3, '11010011010010
01': 3, '0110100100000110': 1, '1010000001011110': 3, '0010100011000111': 9, '110011
1011101111': 2, '1010100001011010': 2, '0101111110101101': 2, '0010010001101011': 3,
'1111000001110100': 3, '1101001110111111': 18, '1100101001010100': 1, '0010110111011
110': 3, '1101111110111010': 8, '1101001011011110': 3, '1011000101101101': 2, '01000
11001010100': 2, '0010010100001010': 1, '1111000011010111': 3, '1010100011111101':
3, '1000101101011011': 5, '1010100111001000': 6, '1010000001000100': 11, '0111100110
111001': 8, '0010010010110111': 5, '0110110011110010': 1, '0000001100001110': 2, '01
00111001001010': 1, '1111010001110011': 1, '0100101100001100': 2, '001010001010111
1': 2, '1010010011000101': 10, '1100111011000011': 3, '1011000110111011': 4, '011011
0001001111': 1, '1101100110110011': 1, '0001101110111010': 1, '1011100110101010': 2,
'0110010011010111': 2, '1011000101000100': 1, '0100011001111101': 3, '00100000110011
10': 6, '0101001011110001': 1, '1011100000101101': 1, '1100101011101111': 2, '100001

0010001010': 1, '1010000001001011': 1, '1101001110100001': 6, '1110100111011110': 2, '0111010111111110': 1, '00001110110011000': 11, '1011000110000111': 6, '0000001011011000': 1, '0111111101111001': 1, '1010000110011111': 4, '0010110010110110': 4, '0011010000100100': 1, '1000001000111110': 1, '0001111110001110': 3, '0000111100111001': 1, '1000011011100001': 7, '0111010000001010': 6, '0110110101011110': 3, '0010111011111010': 1, '0100001111011010': 1, '0011001110000010': 1, '0111100101110101': 11, '1010000001110000': 2, '1111110101111001': 1, '0011100100001101': 2, '0110100101011000 0': 5, '0010110110001111': 2, '0000011011100100': 5, '1101001101100010': 1, '1101001110011001': 8, '1000110001111100': 1, '1101101010010110': 5, '1000101000010010': 1, '1101101100101110': 6, '1101010010011110': 1, '0000001100011000': 1, '0100111001010100': 2, '1001111000011100': 1, '1100011111110001': 1, '0110110101000011': 1, '1000001111101001': 4, '0011100111001101': 1, '1110100110110010': 1, '0010010101011111': 1, '0010000011100111': 5, '0000001110000111': 3, '0111000100100010': 5, '0010010000010010': 1, '0101111110110100': 1, '0000001101011001': 21, '0111010011010101': 2, '0011010010010110': 3, '1101011011111011': 2, '1001101000011100': 1, '0110000101100001': 3, '1001011110001110': 1, '1010110101100001': 5, '1100001111000011': 1, '0111010111100111': 1, '0010110101011001': 4, '1111101100011101': 1, '1110110000101100': 1, '1111000110100001': 5, '1100101111101110': 3, '1111011010011111': 1, '0000001001100011': 1, '0000001110100100': 2, '0010010101000001': 9, '0001101011101011': 1, '1010010101010110': 2, '1100111001101001': 4, '0011000110110111': 5, '0100101111101110': 1, '0101011100100010': 1, '1010010110001101': 1, '1100011001000011': 2, '0100001011001001': 2, '1100011001111000': 3, '1111110101110110': 1, '1100111001000001': 3, '1001111000101010': 2, '1000011111000110': 1, '0000011011111001': 8, '1001111001101001': 1, '1101011100001011': 2, '1010110101000010': 2, '1111100000100010': 2, '0000111101010000': 10, '1000010010101101': 1, '0100101101001001': 2, '1110000001001000': 2, '1101011110101100': 1, '0000111111001000': 5, '1001001000000001': 1, '1001001100001000': 4, '1010110101100110': 3, '0000010001001000': 1, '1111000000111110': 1, '1001101111110100': 1, '1000101111001001': 5, '1000101010100101': 1, '0000101011111011': 9, '0101101101011110': 2, '1110110001001001': 2, '0111010010000100': 4, '1010010010000011': 4, '0111110100100000': 4, '0000001001110000': 5, '1000101011101100': 3, '0010100001100110': 4, '0011010000010101': 1, '1011110001111100': 1, '0101011001010110': 3, '1001111000100000': 2, '1111000000110011': 1, '0101001000101000': 4, '1000101101000101': 19, '0110010101001101': 3, '0111000101101111': 1, '1110000111010011': 3, '0000001111111101': 4, '1000001101101001': 17, '1101110000011111': 1, '0101001111000001': 1, '0010010101010000': 3, '0101010110101110': 1, '0000111000001000': 6, '0000011111100100': 3, '0110100111011010': 2, '1100011001110101': 1, '0100001011000100': 1, '0000111101111111': 1, '1010010110100111': 1, '1110010001010010': 1, '0001101000010001': 1, '0010010010110000': 1, '0010110111101010': 6, '0010100011110001': 2, '1011010000001101': 4, '0101001100100000': 17, '0010010111110011': 7, '0010110100001111': 3, '1011100010100101': 1, '1111100110000100': 3, '1101011100001000': 2, '0010010000111011': 1, '1111000010011111': 7, '0010100001110000': 7, '0101001111011000': 2, '0010010110000111': 3, '0101101001010100': 1, '0000101100110100': 3, '1100101101101101': 1, '0111110101101001': 1, '0010110010000010': 3, '1100111101000001': 1, '0100001110100110': 1, '1110110011111000': 1, '1101101111110101': 4, '1010000001011001': 7, '1111000100011010': 9, '0011000100101011': 1, '1011000010000110': 1, '1110000111011111': 3, '0010100111011100': 2, '1101111000100011': 6, '1111101000011000': 1, '0101011001010101': 9, '1100111001001100': 2, '0111001100000001': 1, '0110010001010100': 2, '0110100101100000': 2, '0001001001001000': 1, '0001011110111011': 1, '1110000011101110': 1, '0010010101010100': 1, '0110100101011101': 5, '0011100100001000': 1, '0110000111111010': 7, '1101011000010010': 2, '0000001001011000': 5, '1000011111100111': 6, '0000001011011001': 3, '0000001110101101': 2, '0001011010010100': 1, '1011110010001011': 3, '1110110001011001': 3, '0110100101111001': 2, '0110010001000101': 2, '1011110000001001': 2, '1000111110000111': 3, '1111000111000011': 5, '1111010101011101': 2, '1011100110010000': 1, '1111010100100101': 6, '1011100100001110': 1, '1010110101110100': 5, '0100101001111100': 1, '0010100010101011': 2, '1011110100100011': 1, '1010010011000001': 6, '1011100111011011': 1, '1101001110000001': 4, '1101011111011010': 1, '01110101100

11101': 2, '0011000101010000': 2, '1101000100011100': 1, '0001011010011111': 5, '110
1001101111011': 2, '0100011011011111': 1, '0010000110000010': 2, '0011000110111101':
1, '1111110101001000': 2, '1000100101100101': 2, '1000111100101011': 1, '01101100001
11100': 1, '1100011011110000': 1, '0110010100001001': 1, '1010110100111101': 3, '011
1010001001100': 3, '1110110010001111': 1, '1000111001111001': 21, '0000010110110001
1': 3, '1000101100010000': 4, '0010000010111110': 2, '0111000100101010': 3, '1011010
000101101': 3, '0111111010110110': 2, '1010011000000101': 1, '1100001101111101': 1,
'1111000010111110': 5, '0111100011001111': 2, '1101111100111001': 4, '11110101100010
11': 10, '1011010000010101': 5, '1101111011100110': 1, '0101011111000010': 1, '10100
10110001100': 1, '1011110000011101': 1, '1110110111011010': 2, '0101111100100101':
5, '0010000010000001': 1, '0000001111100001': 5, '0001011110010011': 1, '11011010100
01010': 4, '0010110011100000': 4, '0101101111011100': 1, '0101001111001010': 5, '011
0100101010000': 1, '1100101101101111': 1, '0000101100110110': 2, '0101101001010110':
1, '1111100010100110': 3, '0111110100001011': 1, '0101111110001111': 5, '10100100100
10000': 1, '1100011000001101': 1, '1111110000110111': 7, '1111000011100100': 1, '000
1111010000010': 2, '1010010110011111': 1, '0101001101111110': 3, '0110110001110011':
2, '1111100010011111': 5, '0111010110001110': 9, '1111101110100110': 2, '01011010100
11000': 2, '0101011101100001': 1, '1000100001101001': 1, '0101011100001100': 8, '000
1011110111110': 1, '0101101110110000': 6, '0000101011111101': 1, '1000101010100011':
1, '0111110101101111': 1, '0111011001101101': 1, '0000001100011111': 1, '11000010010
01100': 3, '1111110111011110': 2, '1011010001011100': 2, '1110010001101101': 2, '000
0001100110010': 2, '0101111101111000': 3, '1011010010111101': 1, '0010100011111000':
3, '1101001100010011': 3, '1100011001000111': 2, '0111000001111100': 2, '11010110010
00000': 2, '0000011110001011': 2, '1010110101011110': 1, '0110110011111001': 1, '111
0100101101111': 1, '0111110010001101': 7, '1110100100010111': 1, '1010010011100101':
5, '0010010101000100': 7, '0111000000011001': 8, '0111010110001011': 3, '00010011000
11110': 2, '0111000100101111': 5, '0101001000101111': 1, '1111110001000100': 2, '111
1000101101001': 3, '0110010001100000': 5, '1111100111110110': 5, '1000001001101001':
3, '0101011100010000': 8, '1101001010000100': 3, '0011100110101110': 2, '10000010000
01100': 4, '1010000111000101': 4, '0101110010111011': 2, '1110000101111010': 1, '111
0100011110111': 1, '0111100111011101': 1, '1000000111110011': 1, '1010010101010101':
2, '1101001001101001': 1, '0111000000110101': 4, '0001011000110001': 5, '11110001001
10111': 4, '1100101101111100': 2, '0010110000000011': 2, '1101111011000110': 3, '110
1011110011011': 5, '1100111111011110': 1, '1111100111000100': 2, '1100011000001010':
1, '1111110000110010': 5, '1010011001010100': 1, '0010010100101100': 1, '11100100000
11011': 1, '0111000011010111': 1, '0101001011011011': 1, '0101011011011111': 3, '110
1101000100010': 2, '0110100011110010': 1, '1011110010000011': 3, '0010000110000001':
1, '1111100110011101': 4, '1010000110011110': 2, '0101111001000001': 1, '01011100100
01010': 2, '0111100101111001': 10, '1101111001001010': 1, '1111111010001010': 1, '00
10010100100011': 1, '0010010010110011': 2, '0000001111001100': 3, '010100110111001
0': 5, '1110010010000110': 1, '0000001111001000': 1, '1011010100110000': 2, '0111001
101011101': 1, '1000011101011110': 3, '1011110000000000': 2, '1111010111010110': 1,
'1100101100111000': 1, '1000111001111011': 2, '0010000100000101': 2, '00001010010011
01': 4, '1110001111010011': 1, '0101111000011111': 8, '0111110111000011': 2, '001000
0100110001': 4, '0111100000001111': 2, '0101101101010110': 3, '1111010100111011': 1,
'1100001111111000': 1, '1001001010100101': 3, '0000001101011111': 11, '0010100110010
111': 3, '1110110011000110': 4, '1101011110001101': 1, '0010010110000000': 1, '00110
10110101011': 1, '1000111000101011': 4, '0111110101010000': 1, '1000001110110011':
2, '0101101101110100': 6, '0101111111101111': 2, '1101001010011110': 2, '11000110011
00101': 1, '1001111000101000': 3, '0010110001000011': 5, '0001111000001101': 1, '001
0110010010100': 1, '0000101001110100': 2, '1111100100001110': 2, '1001111010011110':
4, '0011110010010101': 1, '0001101100000101': 2, '1010000000100001': 3, '00010010011
11101': 1, '0010001111011010': 1, '1111110110100111': 3, '0001001100010101': 1, '011
1000001101100': 1, '1111110001110100': 6, '1010011001000000': 1, '1000011101011010':
5, '1100111011000110': 1, '0001011011011111': 2, '1110110011111110': 1, '10101100001
01111': 3, '1010010110010100': 1, '0100111001100100': 6, '1000011110000010': 2, '000

0011001011110': 4, '0100011011100110': 3, '0111100001011110': 1, '1111000000110000': 5, '0101001010101110': 6, '0110000111100111': 3, '0101011100000011': 2, '00000001000 01000': 1, '1110010011010100': 1, '0010100110001111': 8, '0000100011010111': 1, '111 1000001010001': 3, '0000110001111000': 1, '1110010001101000': 2, '0000010011011100': 1, '0000111010101001': 1, '0011000000110101': 2, '1011000100010110': 1, '00110100001 00001': 3, '1110010011110110': 1, '0111010011011011': 4, '0001101111110000': 1, '000 1011010011011': 1, '1111110100100001': 7, '0101101100101011': 5, '1100001111111010': 3, '0010010000000001': 7, '1101011100100111': 7, '0011001010011111': 1, '01011111111 11010': 3, '0110010010010111': 1, '0010110000010111': 1, '0110010011000101': 2, '101 0010000000001': 4, '0101000100001001': 1, '1010000011000101': 5, '0111011010100010': 1, '1000111000001100': 9, '0100011011111101': 1, '1010010000010100': 8, '10001011101 00101': 4, '0011110101101100': 1, '1000110111111011': 1, '1101111110100100': 2, '111 1000101011000': 6, '0010011011001010': 1, '1101111010111001': 7, '1011000100111101': 2, '0111110100101101': 3, '1111000000010010': 1, '0111100111001111': 3, '10010110001 10011': 2, '0001111000111101': 2, '1101001110000000': 5, '1010110010001000': 6, '000 0111011110101': 8, '0101110100101111': 1, '0010000100001000': 9, '0010010011111100': 5, '0111100010011001': 1, '0100101111100001': 2, '0101011100101111': 1, '00101011010 11001': 1, '1111100000111101': 4, '0101001000011011': 1, '1000000011010011': 2, '000 0011001010010': 2, '0101011001111001': 8, '1001001001011100': 1, '0001101101110001': 1, '1111000101010001': 6, '0100101001001001': 3, '1000011010011010': 3, '11010111011 01100': 1, '1011110000010100': 2, '0100111000101100': 1, '1010110100111100': 2, '001 0100010101001': 3, '0000111101010010': 2, '0010000011101000': 3, '0100101001001100': 1, '0010000001010100': 6, '0100011101110000': 1, '0011010110011110': 3, '00101001101 10000': 2, '0111010111010010': 2, '1110100111110010': 1, '0000111000010110': 1, '101 0100010100010': 3, '0001011010110001': 1, '0111000010110101': 1, '0111010011111110': 6, '1111110110101110': 10, '0101001000010110': 1, '1000101110101001': 4, '1001101010 001011': 1, '0101011101000100': 2, '1100101011100011': 1, '1111110110111011': 6, '00 00011110101011': 5, '0010010001011110': 4, '0110000011100100': 1, '010000110100101 1': 2, '1010000101011110': 4, '1000101000100011': 1, '1110110001100101': 2, '0000011 001100110': 5, '1101101010100100': 4, '1001001110111101': 1, '0111000111111000': 1, '1111010100101100': 2, '0110100011001111': 1, '0110100101001000': 3, '10110000110000 00': 1, '0001101010101111': 1, '0000011110011011': 5, '1001101110010101': 1, '111100 0010010011': 7, '1010010100000100': 1, '0111010111100011': 2, '0010100011101111': 4, '1111101100000011': 1, '0100111011110111': 3, '1101111011100100': 1, '00110001100000 10': 3, '1010010100111001': 1, '1001101101001100': 1, '1010110111101111': 8, '000010 1110001111': 3, '0111000001110100': 1, '1010100111010001': 2, '1111000011110101': 1, '1111010001010110': 1, '0010000001111101': 7, '1101011110100010': 8, '00100100010000 11': 6, '1101011110101010': 7, '0111100000111010': 1, '1001101101100100': 1, '010100 1101000000': 3, '1101011100110010': 3, '0110010010000010': 1, '1010111001001000': 3, '1101001001000101': 1, '0111000100110010': 3, '0110110010101010': 1, '10001110001111 01': 1, '0111100111010100': 1, '1010010101011110': 2, '1110110111101110': 2, '111101 0000000011': 6, '0111110011000010': 3, '1000001001100111': 2, '0100001101110001': 3, '1101111010001001': 3, '1100111011110001': 1, '0100011001101100': 4, '11111000100011 11': 6, '1101011010110000': 2, '0000001100100100': 2, '0111000100111111': 2, '111001 0100010011': 1, '1000111000100101': 7, '1000001000010100': 1, '1001011010000100': 2, '1001101010001101': 1, '0110110110111011': 1, '0000011001110111': 4, '010101101111 1001': 1, '1101001111110111': 5, '1000001100011010': 1, '0111010101011001': 1, '110110 1010000111': 5, '1110100101111001': 2, '0101111000100010': 4, '1101111110101111': 9, '1011110100000101': 1, '0111010000000110': 8, '1101101001100110': 1, '1001001000110 0000': 3, '0101011111101100': 1, '0000011010010011': 1, '0111000010010010': 2, '000101 1011110010': 2, '1110000011000011': 1, '1010000001100111': 4, '0000111000001101': 4, '1101000100001101': 1, '0000101111010101': 5, '0101101010110101': 1, '11001011011110 01': 1, '1101001111010000': 2, '1000001101111010': 2, '0000101000001101': 3, '000011 1100011100': 1, '0100111010001110': 1, '0110110111111110': 2, '0111101010110011': 1, '1010001111110111': 1, '1000111001111110': 5, '1111000000101110': 1, '01001101110111 10': 2, '1101001011110011': 1, '0000101110100101': 2, '0101001111010101': 2, '010110

1101000110': 1, '0001101000001110': 2, '0010010010101111': 7, '1111110111111001': 2, '1111100101010000': 10, '0010110101101010': 1, '0111100110111100': 8, '0011110000010101': 3, '1110000111010110': 3, '1011000010001111': 1, '1101111011111011': 5, '0010110001111010': 5, '1011100110111100': 1, '1010110000011110': 1, '1010100100101111': 1, '0011000100111000': 2, '1001111010100000': 1, '0000101100101100': 5, '0101101001001100': 1, '1011110010010001': 1, '1000011110101010': 4, '0111110011011101': 2, '0000101001011100': 4, '1100101101000100': 3, '0110010101101111': 1, '1000101100100111': 2, '0101101111011001': 1, '0101011100110000': 5, '0100111001110000': 1, '0101011101111001': 1, '0010000101110010': 6, '1110110001001101': 2, '1000111110011110': 1, '1100101111100100': 1, '0000001001101011': 1, '1111000100110011': 3, '0000101000101000': 2, '1000001100010101': 3, '1011000110011100': 2, '1000011110010111': 2, '1100000111101100': 7, '0111000111000010': 4, '0000011110110010': 1, '1010011010001011': 1, '1010110101001101': 7, '1111100101010001': 9, '1100001111001010': 4, '1111000000100100': 5, '1110110011100001': 1, '1111100000110011': 2, '1010110100001001': 2, '1101011011000110': 6, '0001001110110001': 1, '1000111101110001': 3, '0000001111111000': 3, '1010000011111011': 3, '0010010111111001': 4, '0000101100010100': 4, '0011000000101101': 3, '0101101001110100': 3, '0010000001011010': 2, '1111100001011001': 2, '0110110011011110': 1, '0010100010000110': 2, '0010110001110111': 4, '0100101110011010': 2, '0000001110101001': 2, '0010011101101100': 1, '1111010101010000': 3, '1100111101001101': 1, '1110100001100001': 1, '0111010010000001': 7, '1110100111001011': 1, '0111010110101011': 3, '0100101111111110': 1, '0010000100011111': 1, '1010011011000110': 1, '0000001110101110': 8, '0000000110100010': 1, '0111000110110000': 2, '0010101111110011': 1, '1100111111110100': 1, '1110010011011111': 4, '1010000000001011': 1, '1111010101100000': 1, '1011010110101110': 1, '0010100001000001': 5, '1010010011001100': 3, '1001111101100001': 1, '0101011100110011': 2, '0010100100111100': 3, '1000001001000111': 4, '0101111000000011': 9, '0111000110001101': 5, '1010010110101010': 2, '0111010001100100': 2, '1101101100010010': 8, '0000010010111101': 2, '1000111101001010': 1, '0100101011011011': 1, '0010100000001010': 2, '1001101000011101': 1, '0110000100000110': 1, '1101011011111110': 8, '1101011110010110': 3, '1100111111010001': 2, '1101011110011100': 1, '1111100111000101': 2, '1010100100011100': 3, '0100101110011011': 1, '1111100110101010': 7, '0110100101110111': 1, '1101001001110111': 1, '1101111001110100': 7, '0011110010101101': 1, '1101011001011011': 2, '1010110010110001': 1, '1010010111101111': 6, '1101100000111010': 1, '0100001100100101': 1, '1000111111000100': 1, '0000111010100011': 4, '0111000011110110': 1, '0111010100010110': 1, '0001101110100110': 3, '0001001101110100': 1, '1010010000001110': 2, '0110010011001010': 2, '1000010111101101': 1, '0101011010101101': 9, '0010100011000100': 1, '1010100101101011': 6, '1010110001011010': 7, '1011010000011000': 5, '0001011010100000': 1, '0011100100001100': 3, '0010110110001010': 1, '1000101100010111': 1, '1101111101101111': 1, '0110000000111110': 1, '1101011010011001': 5, '1000100111101111': 1, '0111110110001010': 5, '0101111110000000': 1, '0100011101010101': 1, '0001011111110111': 1, '1000101000001001': 1, '1101101010000101': 2, '0111110100110110': 4, '0111110101110010': 1, '1011100110010110': 2, '1100111110100011': 1, '0011010000010100': 4, '1111001111011011': 1, '0011000100011100': 4, '1111100010010101': 1, '1111010001000010': 2, '1000110010001110': 1, '1011000110101011': 4, '0010100001111110': 1, '1001101010011010': 3, '0000001110111100': 2, '1100100111110111': 1, '1101011011101101': 2, '1010100011110011': 8, '1111000000101111': 2, '1111110100111110': 2, '0011100100100000': 2, '0100111011011011': 5, '0101001010011010': 9, '1010110010100101': 1, '0101100100100101': 2, '1000111101100101': 7, '1101101011000010': 2, '1000011111001010': 2, '0101011011100000': 1, '1101101000110111': 2, '1011010010001010': 3, '1010000010010111': 2, '1101011010010001': 8, '1000111000001010': 5, '1001111100011000': 1, '0000111101110111': 1, '1000100111111111': 1, '1010010010101001': 1, '0100011111111011': 1, '0001110010110010': 1, '1111000000001010': 1, '1010100110101101': 3, '1011000100101000': 1, '0100111101001010': 1, '0101011110011101': 1, '1000010001011101': 1, '1111110110100000': 3, '0111110101000100': 1, '1001011110010011': 1, '0111010100001111': 2, '1111100011111011': 1, '0101101010000001': 2, '1111010001011001': 4, '1111100110100100': 4, '1110100110001110': 1, '1101101000111100': 5, '0110010001101010': 1, '1000101011111111': 6, '11011011010

10010': 4, '1011110000110001': 1, '1111100111110000': 6, '1100001101100100': 4, '000
1001010110011': 2, '1101111110110010': 3, '1001111001001010': 2, '0110000101111001':
4, '0111100111101000': 3, '0000001100011101': 4, '1010111011010000': 1, '00011011101
01110': 2, '0001011011001100': 1, '1000001000100111': 1, '0000101001110001': 6, '110
1101111101011': 2, '0110111001011000': 1, '1000011010011110': 2, '0000111010001100':
2, '1101011001110100': 3, '1111000111101001': 2, '1101101101011101': 3, '11001111011
00100': 1, '0101111001011101': 5, '0111110111001100': 1, '0101111000010110': 6, '000
1101000101100': 2, '1000011111000011': 3, '0010000001001100': 6, '0111001110100011':
1, '0010010000000000': 3, '1001001100000101': 2, '1110100100100000': 1, '01110101000
00000': 4, '0101101111101111': 5, '0101001101100110': 1, '1101111100011100': 8, '100
0011111010101': 4, '1101111100011111': 3, '0101001111010000': 2, '0011110011111110':
2, '1101101111111111': 4, '0110100100001001': 2, '1010000100111110': 1, '11110001000
10010': 6, '0101011001100111': 1, '1000011011001000': 2, '0111000100000010': 4, '101
0010100011100': 3, '1100001111101111': 2, '0011100110111111': 3, '1111110000010010':
5, '0111110100101000': 4, '1010000110111000': 1, '1010010010011101': 2, '11000011111
10110': 2, '1100101111110000': 1, '1010100001011001': 6, '0000111010000101': 1, '110
0001100001101': 1, '1000011101111000': 5, '0111001100011000': 1, '1010010010001011':
5, '0010100011010110': 3, '0001101010000010': 1, '1100001001011100': 1, '11111011001
11001': 1, '1010110100010001': 1, '0000101011011011': 5, '1000001011101101': 2, '011
0110010101111': 4, '1011000100111001': 3, '0011010000000010': 1, '1010100101000111':
8, '0001011100110000': 1, '1000111100101100': 2, '1000100101100100': 2, '10001010100
01101': 2, '1000001011110001': 3, '0010100110101110': 5, '0111100001101100': 1, '101
0000011111010': 5, '0101111111001011': 2, '0111010011010001': 2, '0001111110110011':
1, '1101011000010011': 5, '0000001001011001': 4, '0101011010001101': 3, '01011111001
00110': 3, '0001101100001000': 1, '1100011011011110': 4, '1011010011010110': 2, '111
0000101010001': 2, '1010110101011101': 7, '0111010100011001': 6, '0100000001101101':
1, '0111110111111010': 2, '0001000000101010': 1, '1100001101110100': 5, '00100011001
01000': 1, '1100111111101000': 1, '1111000000110110': 2, '0001101010010010': 1, '100
1001010001011': 1, '1111100000111111': 4, '1101001011101110': 1, '1101111011101011':
2, '1011100100111101': 4, '0000011010110000': 1, '0000011101001001': 7, '00001110100
00111': 1, '1100011010000110': 1, '0010111001010101': 1, '1000011000010111': 2, '000
0111000000001': 3, '0110100100000001': 1, '1010000001011011': 2, '0101011100110110':
1, '0101011100010010': 2, '1100101011110011': 1, '1111101010111100': 1, '10100011010
01011': 1, '1010010111111101': 3, '0011100000010011': 1, '1110110010110110': 1, '100
0011001001011': 8, '0111110100100101': 1, '1110110111110010': 1, '1010010111001101':
3, '0011100000101000': 2, '0010010110001011': 2, '1101011110000110': 5, '01100100001
10110': 1, '1110000011111011': 2, '1111101110101010': 1, '0111010110000010': 4, '110
1101001011000': 1, '1100111111000011': 1, '1111110110011101': 2, '0000001010101011':
1, '0110100011111010': 1, '1111100010101001': 2, '1011000011111101': 1, '00000110000
10000': 5, '1111000101111110': 4, '1000111101110000': 6, '1010010111010001': 1, '110
0001001101001': 1, '1110010011010011': 5, '1101000000111100': 1, '1011000010010110':
1, '0100111011001010': 1, '0110110001100111': 1, '0001011100100100': 1, '10101001001
11001': 5, '1100001101001001': 3, '1111110001111111': 2, '1001001100001101': 2, '001
0100101011011': 5, '0000101010100110': 1, '1000101011011100': 2, '0000011001010011':
8, '0101011001111000': 6, '0010100011000010': 3, '1110010101100000': 1, '10000111000
00001': 2, '1010100010100110': 1, '1000011000001000': 2, '1101101001001000': 4, '001
0000101011110': 5, '0001101101110100': 2, '1111010001101000': 4, '1101011011101110':
6, '1010010100001100': 1, '1111000010011101': 5, '0000011111110110': 11, '1010100010
011000': 1, '0110000111100000': 2, '1101101010111101': 2, '0101001010001011': 5, '01
01011111111011': 3, '0010110111010010': 4, '1100101001011100': 1, '000111110011011
0': 1, '0111010001011000': 3, '0011000110001010': 4, '0010000001101001': 8, '1000101
100100001': 3, '1101011011000000': 1, '0011000000111010': 1, '1100101011111111': 1,
'0000011101011000': 4, '0100101101000001': 3, '1101011011110000': 2, '10011010000100
01': 2, '1000011000011010': 1, '1010100010010110': 1, '0011100000000101': 1, '011001
0011110011': 1, '1001101010010111': 1, '1000111010011000': 1, '0110100001100110': 1,
'1101101010111110': 4, '0100001111011110': 1, '1000001100110001': 3, '001101000111010

11': 4, '0110100110100011': 1, '0011000010101010': 1, '0000101010111111': 2, '010010
1110100111': 2, '0101101100110011': 2, '1100011011000011': 1, '0010110110001110': 2,
'1111110000110011': 6, '0111000000101100': 5, '1111110001000000': 4, '00001111001001
10': 1, '1001111000111110': 1, '1001001110101001': 2, '1010000110001000': 1, '111111
0110111111': 2, '0000111110011010': 1, '1011100100000110': 1, '0100001101100110': 2,
'0101011110010001': 1, '1001111100000111': 1, '0000111101000010': 1, '010011110001
00': 1, '1000111110000011': 3, '1110010101101001': 1, '0010010010001011': 6, '100010
1100010110': 2, '0011010000100000': 2, '0000100100100101': 1, '0100101101101000': 1,
'0101001001000001': 1, '0111010000111011': 11, '1010100001100011': 2, '1110110000110
011': 1, '0011100010111001': 1, '1110100110100011': 2, '0111010111000011': 2, '11001
01101011011': 1, '0010010010010101': 1, '1000101100000100': 4, '1101011100010100':
2, '1110101111110011': 1, '0111000101111110': 1, '0101101001001111': 1, '10011011001
01100': 2, '0011000000010110': 1, '0101101110001001': 2, '0001101111101011': 1, '001
1000100100011': 1, '0011110000010100': 1, '1011010010111010': 2, '1000011111100100':
1, '1101111011111101': 1, '1111100101011100': 4, '1101001010111010': 1, '11011010011
10001': 2, '0000001011011010': 4, '1011010010110111': 1, '0111001000011100': 1, '010
0101101001010': 1, '1010100100100001': 5, '1010110000010010': 1, '0001100110001111':
1, '0110000011111010': 1, '1010110100101000': 1, '1100101100001111': 1, '10011110000
01001': 2, '1101001100100011': 6, '1000011000000100': 6, '1001011010011111': 4, '111
0110000110101': 2, '1010010101000110': 3, '0101011111110010': 1, '0010100100101011':
1, '1001011110110011': 1, '0100101001001101': 1, '0111010001110001': 6, '01010011010
01100': 4, '1101111100100010': 3, '1000011001010111': 7, '0000011010000110': 2, '110
1011100101101': 4, '0100111011000111': 2, '1001011000100011': 1, '0000001100100001':
7, '1111000100111111': 5, '1010010110010001': 1, '0011010001000101': 1, '11011011110
00111': 4, '0111100111110110': 4, '1100011001000100': 4, '1101110011101000': 1, '110
0001101001101': 1, '0101111011010000': 3, '1010010011100001': 8, '1010000101101010':
4, '1001011100110101': 1, '0110110011010011': 3, '0011100100111100': 1, '01111100110
10001': 1, '1111010000010010': 2, '1100011101000001': 1, '0011100100110110': 1, '101
1110010110000': 2, '0010000001110111': 2, '0011011000110001': 1, '1000101000101001':
1, '0010100010000101': 1, '0110110011011111': 3, '1101001011011010': 3, '01010110101
11101': 7, '1000101111000001': 5, '0010100110011010': 6, '1001011100001000': 2, '000
1011010001010': 3, '1011000100010000': 1, '0001111001111111': 1, '0101001001100100':
1, '0010100110110110': 4, '1000101010010101': 1, '1100111010010111': 1, '01011010110
00011': 1, '0000101111100011': 20, '1010110110000011': 3, '1001001110111111': 5, '11
11010100101010': 6, '0001110001111100': 1, '1111010000000010': 4, '011111001100001
1': 2, '1111010111011110': 1, '1111010011101101': 1, '0010010010000000': 1, '1011110
010110011': 2, '1111000111001010': 6, '1010110000101101': 10, '0101111100010000': 5,
'0011100010110100': 2, '1000101111010001': 3, '1001111011110111': 3, '10101100100001
11': 4, '0100001111001010': 1, '0100001001101101': 1, '0111100000001110': 3, '000100
1010101100': 1, '0000110011100001': 1, '1100001100100111': 1, '0101011100010001': 5,
'0000111011010100': 11, '0110010000000000': 1, '0100011001001101': 1, '0000011001001
011': 5, '0011100111111110': 1, '0000111111100100': 3, '0111100000011111': 2, '01111
01100001100': 1, '1111110101010101': 2, '0110000111011100': 1, '0010110101001001':
5, '1101011110100111': 3, '1011110110010110': 1, '1100001111110101': 1, '00010010100
10101': 1, '0111010100101110': 2, '0101011011101010': 5, '1100001111011011': 4, '000
0001101100111': 5, '1101101000110101': 2, '0100011001100101': 3, '0000111010010111':
2, '0000011101010101': 9, '0101001010100001': 2, '1111110111110111': 4, '01110011100
01010': 1, '0101111110011110': 2, '1111110011100101': 3, '0000110011000110': 1, '100
0001011000001': 1, '0110011011110110': 1, '1101111111101111': 1, '0000001101110011':
5, '0000001100111101': 3, '1111010110110101': 2, '1010100001011110': 1, '11111100110
10000': 3, '0101111101111010': 2, '1110110010001101': 1, '0111010001001010': 2, '000
1111100101100': 1, '1111001100010101': 1, '0111000110101101': 7, '0100111001001000':
2, '1111001100101000': 1, '1010111001000001': 1, '0000011011000100': 3, '11111000100
10011': 6, '1111010001000100': 1, '1110010101111100': 1, '1101110001111000': 1, '001
1100000010000': 1, '1011010000000100': 1, '0100000111010000': 1, '0101111000001010':
2, '1010110101001011': 3, '1110010011011110': 2, '1111110101010001': 3, '11000011111

10010': 1, '0111110101001000': 1, '0101001000000010': 3, '1101001010001010': 3, '100
0101100001000': 6, '0010110101011111': 3, '0110110011011011': 3, '0010100010000001':
1, '0011100111001011': 2, '0010010000011000': 1, '0000011111100111': 6, '01101001110
11011': 1, '1000101100100011': 1, '1111100000011011': 2, '0011010010011100': 1, '100
1011111011110': 1, '0000000101001100': 1, '0010010101000110': 2, '0001111011000110':
1, '1011000100000100': 2, '1111111010110110': 1, '0101101010000101': 2, '10111001100
01010': 2, '1010010001011011': 9, '0000101001000110': 3, '1000001001010000': 4, '111
1010111111000': 1, '0111100111010011': 4, '1010010101011011': 3, '1001011000001001':
4, '0010100000010100': 1, '0111000011111111': 1, '0010100011110011': 3, '11110100001
00011': 11, '0111110011100010': 6, '1011000111001010': 1, '0111100101111100': 3, '10
010011100011010': 2, '1010010010100000': 2, '0000101000111001': 1, '010001100101000
0': 2, '0010110111101100': 2, '1111010001101011': 2, '1010010011010101': 2, '1111000
111111011': 5, '1101011000001110': 6, '0110110000100011': 1, '0111110100111011': 2,
'1001001100001001': 1, '1110110001000001': 5, '0010100001101010': 1, '00110001100000
11': 1, '1101111011100101': 1, '0000101000110001': 1, '1000001100100110': 1, '110100
1111100001': 1, '0111110110001101': 1, '1111100001110011': 1, '0101011110001010': 3,
'1110010011010111': 3, '0010010011110101': 5, '1111100001001000': 5, '10101010001110
01': 1, '0000001100101110': 3, '0010111101101000': 2, '0000001101011010': 7, '001110
0010101011': 1, '1000101110101110': 8, '0101001011011010': 1, '1010110101110011': 2,
'0110010011101010': 1, '1000011010100000': 2, '1110010100111011': 1, '00001110111111
00': 4, '1001001000111100': 2, '0010010000000011': 1, '0000011110110110': 1, '110101
1010101100': 4, '0101001011011101': 1, '1101001010011111': 6, '0011110100101000': 1,
'0101011110000111': 3, '0100111100110100': 1, '1101111010001100': 5, '10001011000111
11': 3, '0101111100100111': 2, '0110000101000011': 1, '1000001000010101': 2, '010111
1000000010': 8, '0111100010011000': 1, '1001011111000011': 1, '0000101001101000': 8,
'1101111110101010': 3, '0011110100111000': 1, '1110010001010001': 2, '00001011101001
10': 8, '1111100101100000': 3, '0011010000111010': 2, '0101001101110101': 5, '010011
1010110110': 2, '0111110110101000': 2, '0010110001101011': 4, '1110110001101011': 2,
'0111100000111101': 7, '1101001111000001': 2, '0101111011110111': 6, '00111100000011
10': 1, '1001111000000101': 5, '0101101010000100': 3, '0011100101110000': 1, '111101
0100011110': 1, '0000110101011000': 1, '0110110011110110': 6, '0101011010100000': 6,
'1010010000100000': 4, '1111111110100110': 1, '0111010111010101': 1, '11001011111110
11': 2, '1100001101101010': 1, '1011000110011010': 5, '1000001100101000': 3, '100001
1110001011': 2, '0000011101011100': 3, '1010100101110010': 5, '0110010111000111': 2,
'1000010001001011': 1, '0101011110001011': 2, '0110100011001110': 2, '11010110011110
01': 4, '1110010001110000': 2, '0101011111101011': 2, '1101011100000110': 1, '110000
1110101110': 1, '0010010000110011': 1, '1000011111110001': 2, '0010000010000000': 1,
'0000001111100000': 7, '0111111010001011': 1, '0010010100011000': 2, '10000011011011
10': 3, '0101101100110010': 5, '0001011101011010': 1, '1111100000011000': 9, '110101
1001001000': 1, '0000011001100010': 7, '1111011000011001': 1, '0000111011010001': 9,
'0001111011110110': 1, '1111110111100111': 2, '1010100101001111': 6, '11000011011100
00': 1, '1001001010000111': 2, '0011000110101011': 3, '1110100101011001': 3, '011101
0101111001': 3, '0101011011000100': 4, '0000011000000111': 2, '0100011010001001': 1,
'0000001010100111': 1, '0100011001001000': 1, '1000001110010001': 1, '01011111101110
10': 4, '0001001101010100': 3, '1000101100111001': 1, '1011000100101111': 1, '010001
1001010011': 1, '0101111111100010': 1, '0111000111011100': 1, '0111100010110001': 3,
'0010111101100001': 1, '0010100010010110': 1, '1101011100101111': 1, '000000010011010
00': 4, '0101001011010100': 1, '0010101111001110': 1, '1100111000001110': 1, '110100
1000011111': 3, '0111000101001100': 4, '1010010111001000': 2, '1111010110001101': 2,
'1100001100100001': 1, '1001111011001011': 1, '1000101011110101': 1, '00001100111001
10': 1, '1011100111011010': 1, '1101001010100111': 2, '1111010100100011': 3, '100001
1000010010': 1, '0000111000000100': 2, '0100111101100000': 2, '1011010000111000': 2,
'1000001101100110': 3, '0101001111011101': 4, '0010010100010101': 2, '00110001011111
10': 1, '1101101000100011': 2, '1000011111011110': 1, '0001001111010111': 2, '100101
1100010100': 1, '0011000110100100': 2, '0000001110010100': 1, '0010000011010100': 2,
'1010010101101101': 3, '0101111101000000': 1, '1011100100111110': 1, '11111001111011

01': 3, '00000100001010000': 2, '1010110010101111': 6, '1111000110001100': 2, '000001
0000010101': 1, '0100101101010001': 1, '0101111001110001': 7, '1000111000100100': 3,
'1000111111001110': 4, '0011100110101011': 1, '1101001010000011': 4, '00000001100010
10': 1, '1001111000001101': 2, '0110110010010011': 1, '0000011000100011': 1, '001010
0000110001': 1, '1101011110001010': 3, '1000001101000011': 3, '1000011111101101': 3,
'1101011101010011': 1, '1111000011011000': 2, '1000001010110101': 1, '11111100011110
01': 5, '1110100001011000': 1, '1101011100000000': 3, '1010100110000001': 3, '100111
1011100110': 2, '1110100110011011': 1, '0010110101111110': 4, '0111100111001100': 2,
'0110000111010110': 6, '1000111010000100': 1, '1010100010010001': 1, '01100001111010
01': 2, '1010010101000010': 4, '0110100101100001': 3, '0110010001010101': 1, '111111
0001110000': 7, '1010100011011100': 2, '0101001010101101': 1, '1010111001100000': 1,
'1111000100011111': 7, '1101101111110010': 4, '1111100110111000': 4, '10001111101000
00': 1, '0010010010010001': 1, '1010110001111110': 1, '0011110011101010': 1, '111000
0110001011': 1, '0010000001111111': 1, '1000101111101000': 2, '1010110100111111': 1,
'1000010011100011': 1, '0101101101010111': 3, '1101111111100010': 3, '01100101011101
01': 1, '0010100101111110': 1, '0000101011000001': 2, '0101101101001000': 1, '011110
0000000000': 4, '0110110101111101': 2, '0101111001001000': 3, '0111110101001011': 1,
'1010001110000011': 1, '0110101101000100': 1, '1100101100011000': 2, '00001110101010
00': 2, '1000011111010011': 5, '1101101000111110': 1, '1001011110000011': 1, '010101
1011001100': 1, '1111000100001010': 5, '1100111110101011': 1, '1100001100101001': 1,
'0011000100011011': 1, '0010000110011110': 1, '0101001111111011': 7, '00101100011100
10': 7, '1101111011110001': 1, '1111110111011100': 1, '1010111011001011': 1, '101100
0000110110': 1, '0010000100011110': 1, '0111110010100101': 8, '0110100100010110': 1,
'0000011101101110': 2, '0110100001111001': 2, '0000111010110010': 3, '10100100001111
10': 1, '1100011011000111': 6, '1011010000001001': 2, '0011110110011010': 1, '110110
1000011110': 1, '1111100010111100': 2, '0010000101101011': 6, '1110000110101110': 1,
'0000111100100010': 1, '0010000011111000': 2, '0110110010001111': 1, '00000001010011
01': 1, '1111100001011000': 1, '0010100010000111': 2, '0001101100011100': 1, '011100
0000111010': 2, '0111010110010100': 2, '1101011101001011': 1, '1011110000111001': 2,
'1111100111111000': 1, '1010011001111100': 1, '1010110101111110': 2, '10110010000001
00': 3, '0111010010101101': 2, '1000101110111111': 2, '0010100110011111': 1, '111100
1010000000': 1, '1101101001111101': 2, '0000101111000000': 5, '0101101011100000': 2,
'0011100110001011': 2, '1000111010000101': 3, '1011010000011101': 3, '10001100111010
11': 1, '0010011010011010': 1, '1010100100010001': 4, '1000011111101000': 1, '010110
1101111011': 3, '1001111011010010': 2, '0101001101010010': 4, '0001111010001110': 1,
'0000011000010111': 1, '1111000101111011': 2, '1010010011111000': 5, '11111101000110
10': 2, '0010010000100001': 2, '0000101000010101': 1, '1000001100000110': 1, '111100
0111111110': 6, '1100011011111111': 3, '1111100101011011': 3, '1101111111001100': 1,
'1111110001101000': 4, '1111010110110001': 2, '0100101101001101': 3, '11111101100100
10': 2, '0100101100000100': 2, '0111100111100101': 2, '1010100010000110': 3, '011111
0101010011': 1, '1111100101110010': 3, '1111010101000111': 1, '1001001111010100': 1,
'0000001010100011': 1, '1000111101110100': 3, '1010000001110001': 3, '11111101011110
00': 2, '0010100000101100': 2, '1001111100110101': 1, '0100111101010100': 1, '111101
0100111111': 2, '1101011101110010': 3, '0011100010011111': 1, '1010010000111100': 1,
'0101101111100011': 4, '0000111111100111': 5, '1101101101001110': 2, '11100001110011
11': 3, '0111100010111101': 4, '1100011000101111': 1, '1011100000110000': 1, '001110
0110011101': 1, '0001101110111111': 1, '1110000011101010': 1, '0010110010100010': 4,
'1010100100010010': 3, '1010110000000010': 2, '0000011010110100': 1, '11100000010011
00': 1, '0100111001101110': 2, '1100011011010000': 5, '1110100011111111': 3, '100010
1100000101': 3, '1110000101110011': 1, '1101001111000100': 1, '1100001001101100': 1,
'1111110101111100': 3, '0111111010111011': 1, '1011010000100000': 2, '11100001000010
01': 1, '0111000011000010': 2, '1110000111110010': 1, '1000010001101010': 1, '111110
0001111001': 3, '1010100110111011': 4, '0101010010000011': 1, '1000011101010000': 3,
'0000001110111011': 1, '0010100011011000': 2, '1111100000000111': 3, '01011111000110
11': 4, '1111000101001000': 4, '1000001100001101': 8, '1100111011001111': 3, '111000
0111001010': 1, '0001111000000000': 2, '1101111000111011': 8, '0000111000011011': 2,

'1010100010101111': 2, '0000001010111111': 2, '0101010000010100': 1, '00101011110000
01': 1, '0111000100011010': 4, '0100001100101101': 2, '0010010010111010': 2, '000000
1111000001': 2, '0010110111100000': 2, '0000001001000001': 5, '0110110011001000': 1,
'0010100000001100': 2, '0000111010111110': 4, '0010010100000110': 1, '11001011010110
01': 4, '0101011010001000': 5, '0100111110100110': 1, '0011110000000101': 2, '001000
0101010111': 5, '1100111011000010': 2, '1111001100100100': 1, '0000111110010100': 1,
'1110010001100111': 1, '1111010100001101': 7, '0110000100011100': 1, '000001110110110
10': 2, '1111010001011111': 2, '0101001101101111': 1, '0010000110010100': 1, '010001
1111010011': 1, '1011110000000001': 4, '1111010111010111': 3, '0101111011000101': 1,
'1001001000100001': 2, '0101111011000001': 1, '0001111001010100': 2, '01100001110011
01': 1, '1100101111111010': 1, '0010110001101110': 5, '0010000001100011': 2, '000111
1010010111': 2, '0010000011010010': 4, '0000001110010010': 1, '1100101101011100': 5,
'0000001010110100': 1, '0110010011110010': 2, '0101011010110001': 5, '01001000011111
00': 1, '0011000110100000': 1, '1011010001110100': 3, '1011110000101101': 1, '100101
1000010001': 2, '1000110011010011': 1, '1010110110101011': 3, '0111110110011101': 1,
'1101011101110111': 1, '1111010100111100': 6, '1010100111101100': 2, '10010011101110
00': 1, '0001011001001111': 1, '0000001101101110': 5, '1011000100010100': 2, '010001
1000101101': 2, '1111010011110000': 1, '1101101010001001': 5, '0111110010010001': 6,
'0111010101010111': 2, '1001001110110110': 1, '1111010100100001': 4, '10110001000011
10': 1, '0100111000111001': 1, '0110010111100011': 1, '0000101100110111': 1, '111110
0000110101': 3, '0010000100100100': 2, '0101111010101101': 8, '1110010001001001': 2,
'0001011011001111': 2, '1100011011111101': 1, '0010110111100011': 6, '11010011110101
00': 3, '0000001111110100': 7, '1111110011100110': 3, '0101111110011111': 2, '111110
1100001101': 2, '0010100011100001': 6, '0101111001011001': 3, '0000111111101100': 3,
'1100011000010000': 2, '0111000110011100': 5, '0110110111000111': 1, '10001110001001
11': 1, '1100011011110111': 1, '1000110001100000': 1, '1010111011011000': 1, '111100
0010001110': 2, '1110110000110100': 1, '0101001111001000': 1, '0010010101011001': 4,
'0010110110000111': 2, '0011100100000101': 1, '0001001010011011': 1, '10111001011000
01': 1, '0000001000111110': 1, '0000011111011101': 3, '0101111100100010': 1, '110000
1101010000': 1, '0011000101001110': 1, '0001101100110111': 1, '1101011111001010': 2,
'1000001111010100': 4, '0011100100101110': 1, '1011010100110101': 1, '010101101110100
01': 1, '1000101011001110': 3, '1000001011101000': 1, '0001001110011011': 3, '011100
0111010010': 4, '1000001100101110': 2, '0000101000111011': 1, '0011000100101101': 1,
'0111110110111001': 2, '1001001000001100': 1, '0111010011011100': 2, '01001110011011
00': 3, '0010101100001100': 1, '0101001010010001': 1, '1010000001111011': 1, '101101
0000101000': 2, '0001001101111101': 1, '0111000111011010': 4, '0111100001111001': 1,
'0110100011100110': 1, '0111110101101100': 2, '0000001011010111': 4, '01101000101000
10': 1, '1100001101111000': 2, '0000001010111010': 2, '0010000101110111': 3, '111011
0001001010': 1, '0010000011001011': 6, '1011010001011101': 1, '1001111101111000': 1,
'0101111000011110': 4, '0011000101101001': 3, '1000100001101100': 1, '010110111110101
00': 2, '1110110011100110': 3, '0101111001101000': 4, '1111010111101010': 1, '001010
0010110010': 1, '1110110000101101': 1, '0111000111001110': 2, '0010100000001110': 1,
'0000101111100000': 6, '1010110000101011': 1, '0010110101010101': 6, '01111000010111
00': 2, '1000110001001111': 1, '1010000010101010': 3, '1110000011010010': 1, '111000
0101000100': 2, '0011110010100111': 1, '0000001110100010': 5, '1110100011011000': 1,
'1010000100101011': 2, '0110000011100111': 1, '0110010011100101': 2, '00011011100000
10': 1, '1011110110101011': 1, '1100111001110001': 3, '1100001111001011': 2, '101111
0010000000': 1, '1000001100001100': 2, '0100111000100111': 1, '1100101001100101': 1,
'1000011110101110': 1, '1101101000100110': 3, '0001011110000111': 1, '101001011001111
10': 1, '0100011000010011': 1, '0100111001101111': 2, '1000011011100100': 3, '111100
0110011101': 6, '0100011001011001': 3, '0111100000011110': 1, '1101110010011011': 1,
'1111010101101011': 1, '1110110010101001': 1, '0101101100000010': 7, '10100000100100
00': 1, '1001111000100101': 3, '0101011001010011': 1, '1100111001001110': 1, '110011
1100011101': 1, '0101011110011000': 3, '0110110011010000': 3, '0010100010001100': 1,
'0010110000011000': 1, '01000110010111101': 1, '0110010011111001': 1, '10010111101000
11': 1, '0110010011101111': 1, '1000001000011001': 1, '1000001101110010': 6, '001001

0101000111': 2, '0000010011100010': 1, '1100101100010000': 1, '0111110100011111': 1,
'1100011010101101': 1, '1001011010101011': 4, '1000110001000001': 3, '0111100001010100': 1, '1010000010100110': 3, '1111000010111011': 7, '1111000111010010': 3, '0011010011000111': 1, '1000001011001010': 3, '0110000010100110': 1, '1101010010101111': 1,
'0111100001000101': 2, '1100111001100110': 1, '1100111000001001': 1, '0101001010110011': 10, '1111010010010101': 4, '1011010000010001': 1, '1000001111010101': 3, '0101011100010100': 9, '1111110001011101': 11, '0101001101110011': 2, '1010010000101100': 1, '1110110101010110': 1, '1111110011110110': 10, '0110000001101101': 1, '1000011001001111': 5, '1000101011101000': 2, '1010000000011001': 1, '1111110101010000': 4, '0000110001100001': 1, '0001101110100001': 3, '0101011001101011': 2, '1111100111101001': 2, '1001111010100111': 1, '0101101001001101': 1, '0000101100101101': 6, '0011000000010100': 2, '1111100111111100': 4, '1101011101001001': 1, '1010010111001100': 3,
'1010010110100101': 1, '1110010001010000': 2, '1101111111101101': 2, '0101001110010001': 4, '1111110011001111': 3, '0000001100111110': 1, '1011010000010011': 1, '1110000101001100': 2, '0000111100001101': 3, '1000001100110010': 2, '0101111110001110': 2,
'1010110010101001': 3, '0100111011010111': 1, '1010010111000100': 1, '0111110101010111': 1, '0000111110011110': 1, '1001111100101101': 2, '1100111111101111': 1, '0101001111110000': 1, '0111100001110101': 1, '0110000110001011': 1, '1101110010100001': 1,
'1110000111111011': 1, '0011000100001111': 1, '1100101100001100': 1, '0100111100100100': 1, '1101001011000011': 1, '1000010001111001': 1, '0101011000000011': 6, '1010010100110000': 1, '0111100000001011': 1, '0101011011000011': 5, '0010100000100101': 2,
'0001101100000111': 1, '0101111100101001': 6, '0000001010000011': 1, '1101100000111011': 1, '1010000110110100': 1, '0000001011111011': 4, '0111100011011011': 1, '1011100010110111': 1, '1101111110001110': 3, '0101011111111000': 1, '1101000100010100': 1,
'1110110011001111': 3, '0110000110001010': 1, '1111011010001010': 3, '0010010010010110': 4, '0101111001001001': 4, '0101010010010111': 1, '1101011000101011': 6, '1010010000001001': 2, '0101011101010110': 1, '0000111110000101': 1, '1010100111000101': 5,
'0101001110101101': 9, '0010000001111110': 2, '0101011001101110': 1, '0001001110000110': 2, '1011110010000101': 3, '1001011000111010': 2, '0011110110011110': 2, '1011010100000100': 1, '1111110111011001': 1, '1010111011010110': 2, '1110110011001000': 1,
'1010101010010111': 1, '1000111101101011': 2, '1101110010010010': 1, '1101011101010010': 1, '1101011001001101': 2, '1111110110010111': 6, '1011111010101010': 1, '1111100000110010': 2, '1110100110000000': 1, '1101101000110110': 3, '1000101100001001': 5,
'0110010111001100': 1, '1101010000000111': 1, '0010000010100011': 1, '0111000101110001': 6, '1010010111001010': 6, '1111110100010111': 3, '1010111001011101': 1, '0100011111000010': 1, '1011010000010010': 1, '1111000011101010': 2, '1000101100101110': 1,
'0110010101100100': 1, '0110000111001010': 2, '1011000101010100': 1, '0101010000000100': 1, '1000011110000111': 3, '0000011101010110': 1, '0000111010010100': 1, '1011000101010101': 1, '0000011100010100': 1, '1110100110001010': 3, '0000101010101001': 1,
'1010100100111110': 2, '1101011011000011': 4, '1101101001000100': 1, '0111010110010010': 4, '0101111011111001': 3, '1001001111000010': 1, '1010111011100011': 1, '0101001100000010': 6, '1101111110101110': 3, '0001001010110010': 1, '0000011100101111': 1,
'1000011110011010': 1, '0011010100111000': 2, '1011100010011001': 1, '1111010001011110': 1, '1010010010011010': 1, '0010110111101011': 4, '0010110010000100': 3, '1101001001001001': 1, '1111100011100111': 1, '0111100111111111': 4, '0010110111101101': 1,
'0000010001011000': 1, '1110100011101010': 3, '1111110011111011': 5, '0110000110101001': 1, '0111010100011000': 1, '0110000101011100': 1, '1100001000000100': 1, '0101101111101000': 1, '0010100000010001': 3, '0001001011010110': 1, '1010111010000011': 1,
'1111001001010110': 1, '0101111110001101': 1, '0000101000011100': 1, '0001011100011001': 1, '1110000101010101': 1, '0000001100001001': 8, '0100011001101011': 2, '0101011011001101': 4, '1111010111110011': 2, '1000001010000011': 1, '1000111100010000': 1,
'1001001100111000': 1, '0001111100011110': 1, '1010110101010100': 2, '0001111010000000': 2, '1010010000111111': 1, '1011110001111000': 1, '0101111000100011': 2, '1011100010101111': 1, '1001001000001101': 2, '1000001001001111': 2, '0000001000101011': 1,
'1111000010011010': 5, '1000000111001101': 1, '0111000100100011': 4, '0101111111001111': 3, '1001001101110001': 1, '1000101001111000': 6, '1001001110010111': 2, '100010

1101000010': 3, '0101011100010110': 3, '0001101000101001': 1, '0101111011000010': 3, '0110000011110011': 1, '1010110010100001': 1, '1111010101010100': 1, '10100100101100 10': 3, '1000111111110001': 1, '1110010011000011': 1, '0010100011001010': 9, '001000 0100000011': 1, '1111100110111010': 14, '1111110001001000': 1, '1001001110011011': 2, '0100111011100000': 2, '0100011101100001': 1, '1101001011111111': 3, '11111101100 01101': 1, '0010010001100110': 2, '1100011001001100': 1, '1111000110011100': 8, '000 1011010000001': 1, '1000101000100100': 3, '1101111111000011': 1, '1111100011100000': 1, '1000101000100010': 1, '1101001010010101': 2, '0111000001001001': 1, '01110100010 01110': 1, '1101110100101101': 1, '0010000110001101': 1, '0001001000000001': 1, '011 0100100101001': 1, '0101001010001110': 1, '1101101010111100': 1, '1110010001110100': 3, '0101111001001101': 2, '1000001000110100': 1, '1001101100011001': 1, '10110001010 10001': 2, '0000001011001000': 1, '1011000111011011': 2, '1000011010110011': 3, '101 0100001110001': 1, '1100111011111001': 1, '1101111110110011': 4, '1100011011010101': 1, '1110010011111100': 2, '1000101100000000': 4, '1000110011111010': 1, '00000011000 10110': 1, '0101111110000011': 8, '1111010110100000': 2, '0111110111110000': 1, '011 1111000101110': 1, '1011000101101001': 1, '0101001011110011': 1, '1110000001000001': 2, '1101101011111000': 1, '0100011101100110': 1, '1001101110000110': 2, '10100100010 00111': 7, '0001101110001110': 1, '1010010111101001': 2, '1101010010111111': 1, '001 1000000111101': 1, '0010110000111000': 6, '1101101011010011': 3, '1110000110101000': 1, '0000111111000000': 2, '0110110001011000': 1, '0001111010110010': 5, '10010110000 11101': 2, '1000001010001101': 1, '0110011001001001': 1, '1101011010010000': 4, '001 0000011110110': 8, '0000011111101101': 1, '0010000110111000': 1, '1011110010101010': 3, '1110010001000000': 3, '1001111010011111': 3, '0111000010101001': 1, '11011111100 10111': 8, '0100001101110000': 1, '0101101100100011': 7, '0011100000000000': 1, '001 1010010011010': 3, '1010100110111101': 1, '0111000111001010': 2, '0101111010001111': 11, '1000111111001001': 4, '1011010000011001': 3, '0111100010100001': 1, '0011100000 100100': 1, '1111010110000100': 2, '0100101011110010': 2, '1011010010000111': 2, '10 10000010011010': 1, '1001111000010101': 1, '1101101001110000': 2, '010100100011010 0': 5, '0111110100110000': 3, '0000011111101010': 5, '0110100111010100': 1, '1111100 000110111': 3, '0011010000001011': 2, '1101011100001100': 3, '0011010011111111': 1, '0011010000001101': 1, '1011000100000101': 2, '1100101101011000': 2, '01011101101111 11': 1, '0001001100110110': 1, '0101011110111001': 1, '0110110001000000': 1, '000011 1001011011': 4, '0111000111100001': 1, '0001001110101110': 2, '0111010110000111': 5, '0101111011010010': 5, '0010110110000010': 2, '0010100110010100': 2, '10001111111010 11': 4, '0111101110111010': 1, '0111110101100111': 2, '0001001110010011': 3, '001001 0000001111': 1, '1111000010111111': 3, '0000011111110101': 2, '0110000101011011': 1, '0101111100111111': 2, '0101111100110011': 1, '0000010001111001': 1, '01111000101110 11': 4, '0111110101011100': 3, '0101101100100110': 6, '0111110001110010': 2, '111101 0011010011': 2, '1110100101010000': 2, '1111100101111011': 2, '1011100110000101': 1, '1011100011111111': 1, '1010100011100111': 3, '1111110101011000': 3, '10100000000100 01': 1, '1011000100110011': 2, '0100011000001100': 1, '0011010000001000': 4, '101100 0100100101': 6, '0011110010001110': 2, '1111010111010100': 1, '1011000100100110': 1, '1100100101010000': 1, '1001001010010000': 1, '0101011001100001': 2, '01000111111100 11': 1, '0001011101100100': 1, '0001111010111111': 2, '0110010111111110': 1, '000011 1110001101': 1, '0111010100010101': 5, '0111111000010000': 1, '1001101110111000': 2, '1001011101111111': 1, '1000101101011010': 3, '0000111110010101': 1, '10101100001001 00': 3, '0100011011011000': 1, '0010000100010111': 3, '1011000000111101': 4, '111000 0110100010': 1, '1100001100110001': 1, '0100111010100010': 1, '0000111111001101': 1, '1011010000001000': 2, '0011010000110010': 3, '0001001010100110': 1, '11101100110101 01': 1, '1010010100110101': 1, '1111101110000110': 1, '1000111111100111': 3, '110000 1100010011': 1, '1111100010101100': 1, '0001011010111010': 2, '0111000010111110': 7, '1111100111111010': 2, '1100111001000111': 1, '0110110011011010': 1, '00101000100000 10': 1, '1100111111000111': 2, '1111101110011011': 1, '0100001101000001': 2, '011111 0100011000': 5, '1100001111000010': 1, '1001000000011001': 1, '1011010010000001': 2, '0010100000001101': 1, '0000111101110010': 2, '1100011001011100': 2, '11111000010101 01': 3, '0000011011011101': 2, '0100011011011011': 3, '1101001101111111': 1, '001100

0100111010': 2, '1000111101101000': 1, '0111110111110111': 1, '0010110101010100': 3, '0010000011010001': 3, '1101101000101011': 1, '0011000101110100': 1, '01011110011010 10': 1, '1111000011001011': 1, '1111000000101001': 6, '0100111101011000': 2, '001110 0000000100': 1, '1101110000011001': 1, '0101011111101001': 1, '1010011001011000': 1, '1001011000001000': 3, '1000001110011111': 6, '0011110010110110': 2, '11001110101101 11': 1, '0101001101001000': 2, '0000011010111101': 1, '1011110000011100': 2, '101000 0010001011': 2, '0101101111000000': 2, '0010111111111011': 1, '0001101100111001': 1, '0100011001011110': 1, '1101110000111001': 1, '0010110010001100': 1, '01101101111010 01': 1, '1111100111000110': 2, '1011100110000111': 3, '1101001000111100': 5, '110000 1011100111': 1, '1101101010001110': 5, '0100011110011010': 1, '0111110100100011': 3, '0110110011011100': 2, '0101111000000111': 4, '1100011001010001': 3, '100000010011011 11': 1, '0010110000011011': 1, '1110010001101100': 1, '0101011110010100': 2, '000011 1101000111': 1, '1111110011011011': 3, '1010100001010111': 2, '1111000111110011': 8, '1010100011011001': 2, '1000001010111111': 1, '1010010100111011': 1, '11111011100010 10': 1, '0111000011110010': 1, '1111001110100010': 1, '1110010110001011': 1, '011100 0011011111': 3, '1000001001100010': 3, '0000111000100101': 4, '0001101010001110': 2, '0010100011011010': 7, '1110010111110011': 1, '0101100100101100': 1, '01101100110110 01': 1, '1011100100110010': 1, '0000010011101110': 1, '1101010010000000': 1, '100000 1111010001': 4, '1100101111010111': 1, '1010101110001110': 1, '1000111101111010': 2, '1111010100011101': 12, '0010000000101101': 1, '0000101100001000': 1, '1110010000011 010': 1, '0010011111001100': 1, '0000011101011110': 2, '1000011110001101': 1, '01001 01001101000': 1, '0000111010100100': 2, '1010100000010000': 2, '0001101100001010': 2, '1101001001000100': 2, '0111000100110011': 3, '0000011111101100': 2, '01101001110 10110': 3, '0101011111110111': 2, '1000111110110000': 1, '0100111001101011': 2, '111 1110101010111': 1, '0011000011001111': 1, '0000011000100010': 2, '1100011011000010': 3, '1110000101000011': 1, '1011110101011100': 1, '0110000101010110': 1, '00010011000 01100': 2, '0111000100000110': 3, '0101111101010111': 1, '0011010011100111': 1, '011 1110111111011': 1, '1111010111110100': 1, '1111010110100111': 3, '1010100011010011': 4, '0010010100010011': 1, '1010100001100001': 1, '0001111110000010': 1, '10110100001 11010': 1, '1101011011000010': 4, '0101001101010000': 5, '0110110011001001': 1, '100 1111111111010': 1, '1101101101110011': 1, '0111010001001001': 3, '0110100111100011': 1, '0010000001010011': 2, '1010000111001001': 4, '1010100001000101': 3, '11111101110 01010': 1, '0101001101111100': 5, '0010010110000011': 2, '0010110010010101': 1, '000 1111000001110': 1, '0001101100100010': 1, '1110000001010101': 1, '1101111100010011': 1, '0000011001011010': 6, '0010100000100001': 2, '0101111011111100': 2, '00111100000 00001': 1, '0100111001101000': 1, '0110100011100010': 1, '1010100110110000': 1, '100 0001011101111': 5, '0010000101110011': 5, '1000011111101001': 3, '1111110001000010': 1, '0111100111100001': 1, '0011010011010110': 2, '0100111001011111': 2, '10110001111 10011': 2, '1010010111000101': 2, '0110010001001100': 3, '1001101110110000': 2, '000 0101110110101': 2, '0111110101101000': 1, '1110100110110111': 1, '0011010010010100': 1, '1111000101100001': 4, '0001101000011001': 1, '0010001101111101': 1, '00100100101 11000': 1, '1000010111001100': 1, '1000111111000101': 4, '0111010011011101': 1, '000 1101111110110': 1, '1100001111000101': 1, '0100001101010011': 1, '1111100111001011': 5, '1101011110010100': 1, '0110100110010000': 1, '0010101111011000': 1, '10101101000 00001': 1, '1101010010111110': 1, '0010100011110010': 2, '1101011001001010': 2, '111 1010011001000': 1, '0111010101101001': 1, '1110100101001001': 1, '1111101100110000': 1, '0010100001100001': 3, '1011010100101100': 2, '1001101100110110': 1, '10001110000 00111': 1, '0010100100100111': 1, '1111110011000000': 1, '1010010010010110': 2, '100 0111010111001': 1, '1010010101110001': 7, '1111000110000101': 4, '0010010101111110': 2, '0101001111101101': 1, '1100111011010011': 1, '1110000011010101': 1, '10010010000 00101': 1, '1001111010100010': 2, '0011000000010001': 1, '1001101100101101': 1, '000 0101100101010': 1, '0110010000110100': 1, '0000111100111110': 1, '0100111101111100': 1, '0101111011010011': 3, '0001011010010001': 1, '0010110110011010': 1, '11000111011 01101': 1, '1111100100111111': 5, '0111011000101001': 1, '0111010010000000': 4, '011 1110001101000': 2, '1010010111111111': 4, '1010110000001111': 2, '0000101111010000': 4, '0101101010110000': 1, '1010110110010000': 1, '1010101100000111': 1, '10000111011

11110': 4, '1011110010111111': 1, '1011110000011011': 1, '1101011101100101': 1, '101
0100100101101': 4, '1011110010010010': 5, '1111110010111100': 2, '0100101100110000':
1, '0111000110010000': 2, '0001111000110000': 3, '0101111000110011': 3, '10110000100
11110': 1, '1111000101101111': 2, '1111100101000000': 2, '0100000100010101': 1, '101
1010110100111': 1, '1000100101010110': 1, '1111000101100100': 3, '1100101010100101':
1, '0000011001111110': 6, '1111010110010101': 4, '1100001001010100': 1, '01011111000
10111': 3, '1010100001000110': 2, '0101011011001110': 3, '1010110100000100': 2, '110
1110010011111': 1, '1010010100100011': 2, '0010100011010111': 2, '0101101100100111':
4, '1111000010101100': 2, '0101101111000001': 3, '1111011000111001': 1, '10011000100
00011': 1, '0000011111011100': 1, '0010010000101111': 2, '1111101110110011': 1, '001
1010010100001': 1, '0010010011100000': 3, '1110100111110110': 4, '0011000111011000':
1, '1000101010111001': 1, '1011000110101110': 1, '1001101101111000': 1, '11100000110
01010': 2, '0010000100100111': 3, '0101011011000000': 1, '1011010000110011': 1, '001
0000000100000': 1, '1001011011001000': 1, '0101111011010110': 4, '0000011010110110':
2, '1011100111000010': 1, '0111000101001110': 1, '0101011101010000': 2, '00001111100
00011': 2, '0001101110110111': 2, '1001011000110000': 4, '0001011001110100': 1, '011
0010011110110': 2, '0000001010110000': 1, '0111000000101111': 3, '1001011010011010':
2, '0001011111110110': 1, '1111100111110001': 2, '1011110000110000': 2, '10011110101
01110': 2, '0101011101011101': 1, '0110110000110111': 1, '0000001011011100': 2, '001
0110111100010': 4, '0111010011101001': 1, '0110000111010101': 1, '0000111110001010':
1, '1111100010110001': 2, '0101111010101000': 3, '1111100000010100': 2, '10111000111
10001': 1, '0011110010100100': 1, '0100000100111100': 1, '1111101100000101': 1, '101
0100110000100': 4, '1001111011100011': 1, '1011100001101001': 1, '1110110011111011':
4, '0111000011101000': 1, '0010100000011011': 1, '1011010010000011': 1, '01101001000
00101': 1, '1010000001011111': 3, '0010100000000101': 1, '0100101011010110': 1, '000
1101100111111': 1, '0000011000111000': 3, '0000011100010011': 1, '1100001011110111':
2, '0001101110101101': 1, '0001011011001011': 1, '0100101110100011': 1, '10001010001
01100': 1, '1111100011101010': 3, '0110100110110011': 1, '0010010101000010': 1, '101
1000110101001': 1, '1011010000100011': 1, '1101011101011001': 2, '1010110000111010':
2, '1000111100010001': 1, '1111000000100111': 1, '0110000011011010': 1, '10101000000
11101': 1, '1111111000100000': 1, '1000010011101111': 1, '1101101011010001': 1, '001
0000000100011': 1, '0100111001101101': 2, '1101001111111111': 2, '1011100101001110':
1, '0000011001111111': 3, '0001101100001111': 2, '1001011011101010': 2, '10100100011
01011': 4, '0111101110110011': 1, '0001101111001100': 1, '0010000001011001': 3, '010
0011000011101': 1, '0100011101101100': 1, '0111010001111010': 2, '1101111010110101':
7, '0100111011011000': 1, '0100111001010001': 2, '0000111100101110': 1, '10101101111
01101': 3, '0000101110001101': 1, '0011000001101100': 1, '1000111111000011': 3, '111
1110010100000': 2, '0010000001011011': 2, '0000001010100110': 2, '0101101101011001':
5, '0100111011001100': 1, '0110000001001101': 1, '1100101111011011': 1, '00011110001
00101': 1, '0110110001101010': 2, '1101111111110010': 1, '0011110011101111': 2, '001
0110110011000': 1, '1101011110011111': 8, '1111100111000000': 1, '1011110000100101':
1, '1000011000111111': 2, '1100011001101000': 2, '0101001101101100': 4, '01111100111
10101': 2, '1111010000110010': 2, '0011100000001100': 1, '0110110111100011': 1, '101
1000101000001': 1, '0011000110101101': 2, '1100001000101101': 1, '1110110011000000':
1, '0010011001101100': 1, '0001011010011000': 1, '1110000111110110': 4, '11111101000
01011': 1, '0011000111100011': 1, '1111110101111010': 1, '1011010000100010': 2, '111
1100111100000': 1, '1100111000000101': 1, '1011110000100110': 1, '1111101010001111':
1, '0101111100101000': 1, '1000001110010111': 5, '1110100001111100': 1, '01110100100
11100': 4, '0110010011110111': 1, '0000001010110001': 2, '1111000111111001': 1, '110
1111111011111': 1, '0010010010101101': 1, '0101101101000100': 3, '1001011011001010':
2, '1111110110100110': 4, '0110110011101001': 1, '1101111111100100': 1, '10000010011
00110': 2, '0101001011001011': 1, '0101001101101101': 1, '0001001100111000': 3, '101
0001110110101': 1, '0001111010011010': 3, '0001101111000110': 2, '0111100111110100':
2, '1000111111000110': 4, '0001001110010010': 1, '0101010000011010': 1, '00000010101
10011': 2, '1000111110001011': 2, '0000001101000111': 4, '1101101111011001': 1, '001
1000111111010': 1, '1101001111110011': 3, '0100101001010001': 2, '0110000111000010':

2, '1010110111111001': 1, '0110000011100011': 2, '1011100010001010': 1, '00000111101
10011': 2, '0010001101110001': 1, '0101111001000011': 2, '0010110010000001': 4, '010
0111101001001': 3, '0111011010111011': 1, '0000110010110001': 1, '1010010110010010':
1, '1010110111001000': 1, '1101101010101101': 4, '1011110000000100': 3, '01111100110
10101': 3, '1111010000010110': 4, '0001111010010011': 2, '1010010011110101': 4, '011
1101000000001': 1, '0011100110000110': 2, '1111001110010111': 1, '0101001111101111':
6, '1010100010001000': 1, '1100101110100111': 1, '0111000010111101': 2, '01110100111
10100': 1, '0101111011001010': 2, '0011000110011011': 1, '1110110001010101': 1, '101
0100111111001': 2, '0011000100001001': 1, '1101101110001100': 1, '0101011101000010':
1, '0000011000101111': 1, '0010010100001000': 1, '0101001010100000': 1, '10110001110
01001': 1, '1010010111110011': 3, '1101111111011011': 1, '1011010001001001': 1, '010
1011111000011': 1, '0111010111011111': 2, '0111000111101010': 4, '0111010010101000':
8, '0010110111011111': 5, '0110000110111011': 2, '0101101111001100': 3, '01101001110
01110': 2, '0010000110110000': 2, '0100001011111110': 1, '0101111100010011': 1, '001
0010100100000': 1, '0101001011001001': 2, '0010000001011110': 1, '0111010001000101':
1, '1010110010101000': 2, '0000001110111010': 2, '1111111101011001': 1, '00000011101
00000': 2, '0100101110001001': 1, '0100011101000000': 1, '0100101010000010': 1, '111
1011010110101': 1, '0100111000011010': 1, '1010100110000111': 5, '1010100000010101':
2, '0000111010100001': 3, '1000011010001000': 4, '0100001101111100': 1, '00101001101
11011': 2, '0011110010011011': 2, '0100001100001001': 1, '1010100010011111': 1, '010
1001000000011': 3, '1010000111010101': 6, '1110000101110101': 3, '1100111011000101':
1, '0000111011100000': 3, '0001101001011001': 1, '0111010001000000': 2, '00001110101
01101': 1, '1010101101101100': 1, '0001011010010010': 4, '1100001111000001': 1, '001
1100001111000': 1, '1101110000010000': 1, '0110100011000111': 1, '1110000110000111':
2, '0110100111101111': 1, '1010110100101001': 1, '1011010000110100': 2, '01101001101
00111': 3, '1010000001110010': 1, '1110000011000110': 1, '0111000001110000': 2, '011
1110101011110': 1, '0101100110010011': 1, '1001011001000011': 1, '0110100111101000':
2, '1110110011001010': 1, '1011010010110011': 1, '1110000100110000': 3, '11000011111
00100': 1, '1100101111010100': 1, '1100101110101111': 1, '1111100000001111': 1, '110
0011011000100': 2, '1011100110010001': 1, '0000111111001001': 3, '0001111000000110':
1, '1101111111110011': 1, '0010110101010010': 1, '1101110100111011': 1, '11001110011
01100': 2, '0110000110100110': 1, '1001011000100110': 1, '1111100011111001': 1, '001
1110001101101': 1, '1101111101100001': 2, '1111000000000000': 5, '0010000100010000':
4, '0110110010001110': 1, '1111100010000001': 2, '0010100110000101': 1, '00101000111
10000': 1, '1100111101000110': 1, '0111110100110010': 2, '0010000110111110': 1, '100
1111110001110': 1, '1111110100111010': 2, '1000001100000100': 4, '1010001101000111':
1, '0101111000111010': 3, '1100111000100101': 1, '1010010010100011': 4, '01001110110
11100': 2, '0011010001001100': 1, '1010010010111010': 3, '1011000100001010': 1, '101
0111000111101': 1, '1011000100111011': 1, '0101111001111100': 5, '0000001101110010':
5, '1000011110100101': 1, '1011010011111110': 1, '0101001101111010': 1, '00101100110
01000': 5, '1100101011111011': 1, '0101011100011100': 4, '1111010110011000': 1, '101
0100101111110': 2, '1010110111011001': 1, '1110000101000010': 1, '1111110001010110':
4, '1010110010100000': 1, '0110100100110001': 1, '0110100011111111': 2, '00000010101
01110': 2, '1010000110000011': 6, '0000011000100001': 3, '1100001001101101': 1, '011
0000100000000': 1, '0011000100110011': 1, '1100001111100010': 1, '0101100101010001':
1, '1111000101011111': 1, '1001001110111010': 3, '1111010100101111': 4, '11111101010
00101': 2, '0001101100001101': 4, '1010110000101110': 3, '1100011110100110': 1, '111
0100000100100010000': 1, '0110110001101100': 2, '1110010111111101': 1, '1010000011111101':
1, '0001101011010111': 1, '1000011111010010': 3, '0010010010101000': 1, '00000000110
11111': 1, '1000011110100110': 2, '1001011000001100': 2, '0010100101100111': 4, '100
0101011100100': 3, '0110000011010110': 2, '0000111100010001': 1, '0100111010000111':
1, '1110000111111100': 2, '1010100000100100': 1, '1111110010101100': 3, '00000111001
11001': 1, '0011100000001001': 1, '0010110101011000': 5, '1010011000010111': 1, '010
1001011011111': 1, '0110000101001100': 3, '1101000000011101': 1, '0010100110000111':
4, '1011100010100010': 1, '1111010110010011': 2, '0101011110001101': 1, '11000110010
11000': 1, '1110010011000110': 2, '0110000101111000': 2, '0001101010000100': 1, '110

0111101001100': 1, '0000010110001011': 1, '0111000001111110': 1, '1010100011101010': 4, '0010110000011110': 1, '0101111001001110': 1, '0111010110010011': 1, '0101111011111000': 2, '1000001101110110': 3, '1111000011000011': 1, '1000111100101000': 2, '1101011001110011': 2, '1001011101111100': 1, '0101101011111110': 1, '1101101010101111': 8, '1010010000111000': 4, '1000101010011101': 1, '1010000000010100': 3, '0111100011100110': 1, '1101001011001101': 1, '1110100010010111': 1, '0111010001110111': 1, '0101111001101011': 1, '1100111010001101': 1, '1010010110000011': 1, '0111101111010111': 1, '1000100111100111': 2, '1000100111110010': 1, '0101111100011010': 3, '0100111001101010': 1, '1111100101000001': 1, '1100011011000000': 2, '0011100100100001': 2, '0011000111001111': 1, '0011100111100011': 2, '1111010100110011': 3, '0011100010010011': 1, '1001011000010000': 3, '0011110100000000': 1, '0110000101001101': 2, '0111110111010000': 1, '0101001001111001': 1, '1111001100000101': 1, '1110000000010011': 1, '0001011010000010': 3, '1110010101110100': 1, '0000110011001110': 1, '0101001000010011': 1, '1111000001101110': 1, '0101001110000001': 4, '1111100000011111': 1, '0111110011001111': 3, '1010010110001010': 1, '0111110110000010': 6, '0010100011010001': 4, '0101101111100100': 1, '0101111001101110': 1, '1110110011101110': 1, '1100011010101111': 2, '1010001111101111': 1, '1000101010001110': 3, '0111110000011010': 4, '0101111010000101': 4, '0000111011001001': 5, '0001101001110000': 1, '0001111010100110': 2, '1111101011110010': 1, '0001001110000011': 1, '0101011010000100': 4, '0100111011100001': 3, '1011100010110100': 1, '0111100011011010': 2, '1000101011110000': 1, '1110100111100110': 1, '1000001010110110': 1, '1000101011000101': 2, '0111010110110111': 6, '0010110010110010': 4, '0010010100101000': 2, '1001101110000010': 2, '1000111010010001': 1, '0111010100011101': 4, '1010000011010001': 1, '1100111010101110': 1, '1100101111010010': 3, '1101010000000101': 1, '0001111110011111': 1, '0011000110111011': 2, '1110110011001101': 1, '0100101101000110': 1, '1101011100011011': 2, '1111010111001001': 2, '0000001100010011': 2, '0000011000111001': 2, '0110100011101110': 1, '0000101000110100': 3, '0010000011111001': 1, '1010010010110100': 1, '1000111010101100': 1, '0000111111000101': 1, '1000101100001011': 1, '1100001111001100': 1, '1111001101010000': 1, '0111100011000001': 1, '1011111110101110': 1, '1000001000111100': 1, '1111110100001111': 2, '0010000011111100': 1, '0000111000100110': 1, '1000011100010011': 2, '0111001110010010': 1, '1111010100000110': 1, '1111000111110100': 1, '1111100000010011': 2, '0010010111011001': 2, '0100001101100001': 1, '1101101111011000': 1, '0000010011111010': 1, '1101011011100000': 2, '0101001011010111': 1, '0011100100100100': 4, '1100111000110000': 1, '0011000110110101': 1, '1011100001110100': 1, '0010000110011111': 1, '1100101111111110': 1, '0110010011101101': 1, '1111100011010111': 1, '0111010100100011': 1, '0000001010000010': 2, '0001101010011011': 2, '1101101101000100': 1, '0001111100111101': 1, '0010010100001101': 1, '0101011100111111': 2, '1110110111100000': 1, '0000111010100101': 3, '1110000111111110': 2, '0000011110110111': 1, '1010101001101000': 1, '1101011011001110': 2, '0111110100100111': 3, '0100001101100101': 4, '1100101110011010': 1, '0000101000100000': 1, '0001101110111101': 1, '0001001100101101': 2, '1010110011100001': 4, '1101111011101110': 5, '0011000110001100': 2, '1111110101100000': 1, '1011110111001111': 1, '1000001110011000': 3, '0110011010101110': 1, '1000001011001100': 2, '0011100110001101': 1, '0001001101000100': 1, '0101001111001100': 1, '0000101001100010': 2, '0001101110110011': 2, '0001011011010101': 1, '0001111010011101': 1, '1111110110010000': 3, '1010010010110001': 2, '0000001101101111': 3, '1100101100001010': 1, '1110000101000000': 2, '0011110010100011': 2, '0010011011111011': 2, '0010000010100010': 1, '0101101101000111': 1, '1010010000001000': 4, '1010100001011011': 1, '1111110011010111': 2, '1100101011100111': 1, '0101001001000101': 1, '1111000100110110': 2, '1100101101111011': 1, '0111000011010000': 1, '0010100011100100': 1, '0011100010001011': 1, '1111010100101011': 1, '0100111001100101': 1, '0101011001101111': 1, '0001001110000101': 1, '0110100111010101': 1, '0111010011000110': 2, '0100101101101100': 1, '0001001010010010': 1, '0111010111111010': 1, '0111100111101101': 1, '1110100111011010': 3, '0011010001011000': 2, '1111101101010001': 1, '1101101100100010': 3, '0010000000100101': 1, '1111100001101001': 1, '1010010000001111': 1, '0110010011001011': 1, '1001111001010010': 1, '0100011111010111': 1, '1011100110101001': 1, '0010000001001010': 2, '0000111100110001': 1, '1011110100110101': 1, '00000011001

00111': 1, '1001101000010100': 1, '1001011110010100': 1, '1010010011010000': 2, '101
1100111111010': 1, '1011010001000000': 1, '1011100001110101': 1, '0101101111111001':
1, '1111010110100110': 2, '0110110001010001': 2, '0001101110101111': 1, '01110000110
01101': 1, '0100101110101001': 2, '1110010001010011': 1, '0000000011111010': 1, '111
1110100011111': 2, '0011000110101111': 2, '0100001101111010': 1, '0000001110110011':
3, '0110000100101001': 1, '1100111011010111': 2, '1000101111010000': 2, '01110010000
10111': 1, '1011010010111100': 1, '0100101101000101': 4, '1011100100000001': 2, '101
0011001111111': 1, '1110010011111000': 3, '1000001010110011': 1, '1000001101100011':
6, '1110100011110010': 2, '1110000101111101': 2, '1101000111111010': 1, '11110001110
11110': 5, '0000001000111100': 2, '0010000000100010': 1, '0110100100010001': 1, '000
0011101101011': 2, '1011110000100000': 1, '1011000110011101': 1, '0111011110001111':
1, '1001011000100100': 2, '1010100011101100': 2, '0101001101001001': 2, '11100001110
10010': 1, '0011110000010001': 2, '1011000010001011': 1, '0111111110010010': 1, '010
1011000101010': 2, '0111010100101010': 1, '1111100011011110': 1, '0001110011001010':
2, '1010110000100101': 4, '1100111010110011': 1, '1111011000110110': 1, '00110100101
01110': 2, '0011110010110011': 2, '0010010001101111': 7, '1111110110111100': 1, '111
0110011111101': 1, '1011010100011000': 1, '0011000110100011': 2, '0000001110001001':
3, '0010000011101001': 2, '0111110101111101': 1, '0100001011001110': 1, '11000110011
11101': 1, '0010110101111010': 1, '0110000111101010': 2, '0001111010110111': 1, '100
1111000001000': 2, '1001001100000011': 1, '0001101100101101': 1, '1000101011011111':
2, '0101011110000000': 2, '1111010110001100': 2, '0011100000101100': 2, '01010011011
10111': 1, '0101100110101011': 1, '1000001011101011': 4, '1000001011000000': 2, '001
0010111100110': 3, '0101001100110111': 2, '1100101101010011': 1, '1100001101001010':
1, '0000111010010000': 2, '0000011101010010': 1, '1000011110000011': 1, '11010110001
01110': 1, '0001111010100011': 1, '0000001100111010': 1, '0010010110110010': 1, '111
1010110100001': 3, '0000101001001010': 1, '0100111111110010': 1, '0101110010001011':
1, '0000000101001001': 1, '0111011010000100': 1, '1110110011101011': 1, '11001010010
10010': 1, '1110000011010011': 1, '1111100000111100': 2, '1101011101011000': 1, '111
1100000010110': 2, '1100111111111100': 2, '1110000110011111': 1, '1101111100011011':
1, '1111100111110010': 4, '1111010100011011': 1, '1011110010011111': 1, '01000011011
00100': 4, '0010110100000100': 1, '0000101110111000': 1, '0101101011011000': 1, '111
1000000001111': 1, '1011100100011000': 1, '0101001000011110': 2, '1100011011001100':
1, '0010110010010011': 2, '0001111000001100': 1, '1010001110100011': 1, '10110001000
10001': 2, '1011010000010000': 3, '0010110010100100': 4, '0010100100101010': 1, '011
0000101100110': 1, '0010011100001100': 1, '0010010010100101': 1, '1111110110100001':
2, '0010100010111011': 1, '1100101101110100': 1, '0000101000101101': 1, '00101101110
10100': 2, '1100101001011110': 1, '1000010001011111': 1, '1101001010010000': 3, '010
1101111101011': 3, '1100111000111101': 1, '0010101111011010': 1, '1010010010000001':
2, '1100111011100010': 1, '0011100101111100': 1, '0000111010100010': 2, '00110001001
10001': 1, '1010100000010100': 1, '0000111010100000': 3, '0000001000110110': 1, '110
0011011001011': 1, '0100101011101111': 2, '0100101000110101': 1, '0110100011001010':
2, '0001101000000000': 1, '0010010010100011': 7, '1010000000101001': 4, '10100001001
00010': 1, '1110110001101001': 2, '0101101101110111': 2, '0001101110100010': 1, '000
0101110001100': 2, '1010110111001100': 1, '0101101010001100': 1, '1101001001011000':
2, '0010110001001111': 2, '1000111000001111': 1, '0100111011010010': 3, '10101001100
01100': 2, '0001100110110010': 1, '1101011011000111': 5, '0010110011000000': 2, '100
0011111111000': 1, '1101101110010100': 2, '0100101111011001': 2, '1111101000111110':
1, '1001001100011000': 1, '1000011000111110': 1, '1010000000110001': 1, '01111100101
01100': 4, '1101001010000001': 1, '0001101111101111': 1, '0110001101011100': 1, '101
0010010101000': 2, '0110010111001111': 1, '1111110100010011': 1, '0110000101001011':
1, '0010000000110100': 1, '0001111101100101': 1, '1001101100100101': 1, '01011010010
00000': 2, '0000101100100000': 4, '1000110111110011': 1, '0001111000101111': 2, '010
0001101011100': 2, '0101001101111011': 1, '0010010100010000': 3, '1011010000111100':
3, '0110100110100000': 1, '1111100001010000': 3, '0010110010111010': 1, '00001010111
11000': 1, '1111000000000110': 1, '0111110011011001': 2, '0001111101110101': 1, '001
0010100001100': 1, '1100001110111000': 1, '0000101000110101': 1, '0000101010001010':

2, '0100101101100100': 1, '0101001001010010': 1, '0111100000111110': 1, '11101100011
01100': 1, '0110100011100000': 1, '0110110000000100': 1, '0111110111101011': 2, '101
0000011011100': 1, '00001110101111111': 1, '0110100001001001': 1, '0001101010011001':
1, '0010100011100101': 1, '1000001100000101': 4, '0000111000011100': 2, '11110101100
00001': 1, '1101001010111111': 5, '1101101101011110': 1, '1000011000011100': 3, '000
0111000001110': 1, '0110000100001001': 1, '1101110000111101': 1, '0001101100110110':
2, '0011010011110011': 2, '1100011000001001': 1, '1011010011001000': 1, '11110000110
01110': 1, '0101111010001101': 3, '1001101101101101': 3, '0010111111100001': 1, '100
0001110100101': 1, '0101010000101111': 2, '1000001110011101': 1, '0001101100000001':
3, '0110010011101100': 1, '0101000110100011': 1, '0101001000111010': 1, '01010010000
10111': 2, '0001101101001001': 1, '1011000000100100': 1, '0000001110101000': 1, '101
0000001101011': 2, '1111100101110111': 4, '0101010000110111': 1, '0010101110101111':
1, '1111100111001001': 1, '1111110101010010': 1, '1111110100111111': 1, '10101000010
10001': 4, '1111110011011101': 2, '1000101000111000': 1, '0101011100010011': 3, '001
1100101110110': 1, '0011010001001101': 1, '0100011110010011': 1, '1001111000010000':
1, '1010000011110000': 1, '1110110110000110': 1, '1111110001011110': 2, '10011011101
01011': 1, '0001101111010010': 2, '1010100010000111': 2, '1010101110010010': 1, '110
1000000111010': 1, '1111000000100000': 6, '1010100110100100': 1, '0000101010000011':
1, '0010000010100101': 2, '1000001100100101': 2, '1101011100011010': 1, '11101100100
01110': 1, '1000100010010100': 1, '0111111001101010': 1, '1011000000100011': 1, '101
0110001101110': 4, '0010100011001101': 1, '1001111000011101': 1, '1111110111001111':
3, '1010010000000100': 2, '0001011011110011': 1, '0011010011011111': 1, '11110111101
11110': 1, '1111010100010111': 3, '1110110001010110': 1, '0001111110011010': 2, '110
0111001100111': 1, '1100111001111110': 1, '0101101111101101': 1, '1000011010110100':
1, '1011000100001101': 1, '0101001010010100': 1, '1111011100011011': 1, '01101001111
11110': 1, '0011110010011111': 2, '1100101111011100': 1, '0100001100101001': 1, '000
1111000100100': 1, '0011100000110001': 1, '1111010001000001': 2, '1111100010010110':
4, '1111100010101111': 8, '1111100001101000': 1, '1010110101000110': 1, '11100100011
01111': 1, '0001000111101001': 1, '1001111100011110': 1, '1011110101100001': 1, '000
1001010100111': 1, '0101111101011110': 2, '1000101001001111': 3, '0100011000110000':
1, '1001001000101100': 1, '1001001011001111': 1, '1001101100111111': 1, '11110001110
00000': 2, '1011110010011100': 1, '0000111011100001': 1, '1110000001000000': 2, '110
1001010101011': 2, '0101111101001101': 2, '0100111001111100': 2, '1000101011110010':
3, '0100101011110110': 2, '0111110111111111': 2, '0010000001110000': 1, '00110110011
11001': 1, '0110000001000101': 1, '1010000110111111': 3, '1110110011110111': 2, '110
1101101011011': 1, '1001011010000110': 1, '0001101100111011': 1, '1100011011111011':
2, '0000011000000110': 1, '0011100111100110': 1, '1100101000110100': 1, '01010111010
00101': 1, '1100101011100010': 1, '1111010100011111': 2, '1010101111110010': 1, '001
0010110101011': 1, '1110000111000001': 1, '1111100000101011': 3, '1101010001110010':
1, '0111010101001011': 1, '1111010011101100': 1, '0110100101101101': 2, '01000110100
10100': 1, '0101111111100011': 1, '0101011010111100': 4, '0101001101011110': 2, '001
1010010010011': 2, '1101001010101101': 2, '1101111110010000': 1, '0010010110101010':
1, '0100001100101100': 1, '1111110101011100': 2, '0110100111110111': 2, '11111000010
10111': 1, '1000001110000101': 2, '0000111101000101': 4, '0100111101000011': 1, '010
1011110010110': 5, '1101111001010111': 1, '0100011011100001': 1, '1110110000010101':
2, '1010010110000000': 1, '1010111101000100': 1, '0010010110110110': 1, '10101110011
00100': 1, '0011111000001110': 1, '1010001111100010': 2, '1101011011001111': 5, '111
1110011011000': 1, '0011000111111101': 1, '1011000100001011': 1, '0001101000100101':
1, '0001111011010111': 1, '1101101100100011': 1, '0111100111000001': 1, '11110000000
11110': 2, '0011000100011110': 1, '0010000110011011': 2, '1100111010101010': 1, '010
1001001011010': 2, '1101101010100101': 3, '1010100110100001': 2, '1000011110101111':
2, '0111100000011011': 1, '0010000010110011': 1, '1011110011101111': 1, '01111101010
01101': 1, '0000010001111110': 1, '0111000111001000': 2, '0000110011010110': 2, '110
110101101101': 2, '1011010000110101': 1, '0010010100011111': 1, '0100111001100011':
1, '0000111100110010': 1, '0100111101110100': 1, '1100111011110010': 1, '10111100100
00100': 1, '0011100011110010': 1, '0001101100110001': 1, '0000011000100000': 1, '011

1010100000100': 2, '1111100011110000': 1, '0101111001110110': 1, '0110010011100110': 1, '1111110101000001': 1, '1110010011000010': 1, '1000111111110000': 1, '1000011111011100': 1, '0011010000110101': 1, '0111110100101111': 2, '0010100001000000': 3, '0010010100101101': 2, '1101111110010001': 2, '0010000110000100': 1, '1111010100010010': 1, '0010000000000001': 1, '0110010011000011': 1, '1010010000000111': 2, '1010110101001010': 1, '0101110010011111': 1, '1011010100101001': 1, '0011110110001101': 2, '1011010001010010': 2, '1101011101011110': 1, '0010011011110010': 1, '1111010110111001': 2, '1000110001110001': 1, '0000001000001000': 2, '0011010100111001': 1, '0101111011001000': 2, '1110000011010100': 1, '1100001111001110': 1, '1100011001101101': 2, '0101111111100110': 1, '0010110101011100': 3, '1011100100101001': 1, '0100011001010001': 4, '1100111010001100': 1, '0100111001001001': 2, '0000011100001101': 2, '1111100101010111': 2, '0100011010001010': 1, '0111000111011000': 1, '0011000111110110': 1, '0010110101011110': 2, '0010111001101000': 1, '1101001011100110': 3, '1100111111110011': 1, '1000100001001001': 1, '0110000001001110': 1, '1011110001010001': 3, '0010010001110010': 2, '0000011110011111': 1, '1011100000011001': 1, '0111100011010100': 1, '1000010011100111': 1, '1010110100101101': 1, '1001101110101100': 1, '0101000111101010': 1, '0111100000101110': 2, '1100011011000110': 2, '0100011001001010': 1, '1101111111001010': 2, '1111010100100010': 1, '0011100010000010': 1, '0100111111011111': 2, '0001001111101101': 1, '1110010001100001': 1, '0110000111100011': 1, '1010111000100000': 1, '0110110001010111': 1, '1111110111101001': 1, '1010110000011010': 1, '1010100100001110': 3, '0011100110101000': 2, '0110110010010111': 1, '1010000001111100': 3, '1011000000000111': 1, '0011110110000101': 1, '0001001101011101': 1, '0011000111110010': 1, '1111110111000100': 1, '0101111100011000': 2, '1010100110001001': 1, '1010010010101101': 1, '1111000011001010': 3, '0010000110011000': 1, '0000010001000001': 2, '1011100110010011': 1, '0001101110110000': 1, '0010100001110111': 2, '0011000000110111': 1, '0011110110000100': 1, '1001101010111010': 1, '1110110011001001': 1, '0100111011010110': 2, '1000011110110110': 1, '1111110111110010': 1, '0101101011011001': 1, '1111011010100110': 1, '1101010000000110': 1, '0011000100111110': 1, '0101100111010100': 1, '1101100110000011': 1, '0011010000111011': 2, '1011100100001111': 1, '1010011001110001': 1, '1010110101110111': 2, '0001101000100001': 1, '0101111111011100': 1, '1010101101011111': 1, '0110110000011100': 1, '0011110100011000': 1, '0011010011101010': 1, '0010100000110000': 1, '1001101101001000': 1, '0000011111110011': 4, '0000111100011010': 1, '1000001011000011': 1, '0000011110110101': 1, '1000001000001101': 3, '1111100101011010': 4, '1001111000111011': 2, '1010000010000110': 1, '1001111011010111': 1, '0110110111100101': 1, '1100001111101010': 1, '1000000111010010': 1, '1011000100010111': 1, '0101011110101000': 1, '1011100100010100': 1, '1011010010111110': 2, '0111001000010001': 1, '0010010000001110': 3, '1010100010000000': 1, '0011110010000100': 1, '0111000001100001': 2, '1111010100010000': 4, '0110010001000011': 2, '1111111101110100': 1, '0101011100011111': 2, '0011100111101010': 1, '1111101100110100': 1, '0100011000110100': 1, '1011110010001111': 1, '0111010110010101': 1, '0000000010000010': 1, '0001111001110001': 1, '0111100010000101': 1, '0000001001001011': 2, '1010000011010100': 1, '0001111000010010': 1, '0001111010111011': 4, '0000011010111001': 1, '1010010101001011': 1, '1101110010011001': 1, '1111000100001110': 2, '0101001010101001': 5, '1111001110100001': 1, '0101001010110001': 1, '0100111011010011': 2, '0000101100101011': 1, '1100101001001101': 1, '1111111000101101': 2, '0000011100111100': 1, '1010100001111000': 7, '1110110000101000': 2, '1111001100001100': 1, '1010100110111000': 1, '0000011011000001': 1, '0110110111100110': 1, '0011110110010110': 1, '1001101010100100': 1, '1010010111111001': 3, '0110100111100110': 1, '0111010111011100': 1, '0101011111000110': 1, '1010000000000111': 1, '1010100110100000': 1, '1111100111010101': 1, '0011000010111110': 1, '1001001111010110': 1, '1010011001011001': 1, '0000101010011000': 1, '0010000000110010': 1, '0110110111111010': 1, '1000011110110111': 1, '0000111101010110': 1, '1000011111010111': 3, '1010010000101001': 3, '1110110011110110': 3, '1011100000010101': 1, '0010010001110011': 3, '0111100001000010': 1, '0110100111001010': 3, '0000011111001100': 2, '1100101001011001': 1, '1101101111101000': 1, '0101111101100000': 1, '0111000000100011': 1, '1011010010110101': 1, '0010011000111001': 1, '0010000110100000': 1, '0100111010001111': 1, '1011000110111110': 2, '00011100010

00001': 1, '0100111011000110': 1, '0000001000000001': 1, '1101001111011011': 1, '1010000000001101': 2, '0010101110010101': 1, '1011000000001111': 1, '1101100010010011': 1, '0111000000101011': 1, '0110010001001101': 2, '0111100011100011': 1, '1010110111110001': 1, '0111000001001101': 2, '1001101000011010': 1, '0001101100110101': 2, '1001011110011101': 1, '0101011011111100': 1, '0000001001110011': 2, '1000001010010111': 1, '0101011101011001': 2, '0011010110010000': 1, '1000111110110111': 1, '1011010111001011': 1, '0000001001100010': 2, '0110110101000000': 1, '0001111010010000': 2, '1101100110010101': 1, '1000101000100000': 1, '0001011000000011': 1, '0101001101000001': 1, '0000011110000011': 2, '1111000001011100': 2, '0111000011111101': 1, '0010010010000111': 2, '1011010010101011': 1, '1011110010000111': 1, '1010000111111101': 1, '1010100010001100': 1, '0101101101100100': 1, '0100101101100101': 1, '1101011100001111': 1, '0000111000001111': 2, '1110000101101000': 2, '1001111001101111': 1, '1010000000001001': 1, '0101101110000100': 8, '0001001100001001': 2, '0110100110110001': 1, '0100101001010100': 1, '1011110100001101': 1, '1000001011000100': 2, '0011000000011001': 2, '0100101110101011': 1, '0000110000000001': 1, '1011110110110010': 1, '1011010101110100': 1, '0000000110101011': 1, '1000111111100101': 1, '1011110001001001': 1, '0111010110000100': 2, '0011010111111010': 1, '0010110000010110': 1, '0111000011110011': 1, '1001000111111011': 1, '1000110001100010': 1, '1000001001110011': 1, '0001101110100100': 1, '1011100010011010': 1, '0100011000101100': 1, '0100101101001110': 1, '0110010101000001': 1, '1001001110011110': 2, '0000100111011111': 1, '1001101010110010': 2, '1011110110011110': 1, '0010010000001011': 2, '1011010011010111': 1, '1110000101010000': 2, '0011010000110001': 1, '0010011001111100': 1, '1000011111100001': 1, '0000111000011101': 2, '0110010001000010': 1, '1111010001111011': 2, '0110000101110101': 3, '1000100101111000': 1, '0011010110100011': 1, '0000011110000110': 1, '0000001010000100': 2, '0011111000011110': 1, '1110110010100001': 1, '1110110001101000': 2, '1111100101010010': 3, '1001011101111110': 1, '1100111111101101': 1, '0101001111110010': 3, '0010001100011101': 1, '0100101100001101': 1, '1000011010011111': 2, '1100001100000001': 1, '0100011001111001': 1, '1100011001100010': 1, '1101011101010101': 1, '1110100111111010': 1, '0111010111011010': 1, '1011010011000011': 2, '1000101010010110': 1, '1011010100100101': 1, '0001111110000000': 1, '1000100010011011': 1, '1000001100110011': 1, '1011010000110001': 1, '0100111001011101': 1, '1000101110001100': 1, '0111110101100001': 1, '1011000101110011': 1, '0011100011111011': 1, '1100001111100011': 3, '0010110100111000': 1, '1000011010111001': 1, '1000001100100010': 2, '0011110100100001': 1, '0000111110111010': 2, '1110010101100101': 1, '1111000000011010': 3, '0010110101110011': 2, '0101010110011010': 1, '1000010011110101': 1, '1101011101011111': 1, '0111000001011111': 1, '1101001001001101': 1, '1000011000011111': 1, '0000011001001010': 2, '0101001101001011': 1, '1001011100100101': 1, '0001111110011001': 1, '0011110100001000': 1, '1010101100001100': 1, '0011110010001111': 1, '1011010000100101': 2, '0000001101111010': 3, '0000001100011010': 1, '1110110011000111': 3, '1001101111110101': 1, '1101011001001011': 3, '1011110001010110': 1, '0010110010011010': 1, '0110000101000101': 3, '0011100110101001': 1, '0110010001011101': 2, '0001111000111000': 3, '1100001111011001': 1, '0101111101110110': 2, '1000010111011000': 1, '0010000011011101': 1, '1110010001110010': 2, '0010000001110110': 1, '0011000100101010': 2, '0110000101110111': 1, '0101001101010110': 1, '0010010010010010': 2, '1100011001110100': 1, '1010010011010001': 3, '1011110000000011': 1, '0100000101000001': 1, '0001001010101110': 1, '0110100111000011': 3, '0101101111000101': 1, '1001111011001111': 1, '1100001100100101': 1, '0000110011100011': 1, '1111110001101101': 1, '1111110100000111': 2, '0011000111101111': 1, '0010110010111001': 1, '1000000001110101': 1, '0011010111010000': 1, '1010110010010110': 3, '1000001001101100': 2, '0111010111101101': 2, '0100110000000000': 1, '0110110001110101': 3, '1101101110101101': 4, '1101111111001111': 3, '0011100001001001': 1, '0010000010100111': 1, '0010000100100010': 1, '1100011011110011': 1, '0111011010100011': 1, '0101001001011111': 1, '0100011101001100': 2, '1110100001001110': 1, '0010110010111111': 2, '1000000101111011': 1, '1010001011000110': 1, '1010010010111110': 2, '0000101010010110': 1, '0011110010011001': 1, '1111000101000001': 1, '1000111000101010': 3, '1100011011110001': 2, '0001011111001110': 1, '0101110000001100': 2, '1110010010101100': 1, '1001001011001101': 1, '0110110000100001':

1, '1111111000001100': 1, '0101111011000011': 2, '0101001000001011': 1, '01111000111
01001': 1, '0000001100100110': 2, '1111010111101110': 1, '0100001101110011': 1, '100
0000100110101': 1, '0110100011000110': 1, '1011110110011011': 1, '1010010110100010':
2, '0100000101110001': 1, '1101101101000111': 1, '0011010000000110': 1, '01011011010
11111': 1, '0011000111000110': 1, '1001110000010100': 1, '0101011100100110': 1, '010
0101111101010': 2, '0101110000000010': 1, '0001111001111101': 1, '1001011011111111':
1, '0101111101100011': 1, '1000110011010111': 1, '1010101111110110': 1, '00110000000
11000': 2, '1101011101000101': 1, '1000111110111010': 1, '0101010000110100': 1, '011
0111011001001': 1, '0010011000011101': 1, '0100001101010100': 1, '0110100111100111':
3, '0100001001100111': 1, '0101101101011011': 2, '1100011111000011': 2, '01011111011
00110': 1, '1001001100000000': 2, '0000111010110000': 2, '0101011101000001': 3, '111
0110111001001': 1, '0011000110111110': 2, '0000001010001011': 2, '1010000100010110':
2, '1000010011101101': 1, '1101100100101101': 1, '0100011011110010': 1, '10100100000
11011': 2, '1110000011000000': 1, '0100011011011001': 1, '0010000000000101': 3, '000
0011010100000': 3, '0001101101001111': 1, '0010010100011001': 2, '0100001001100100':
1, '0000111000100111': 1, '1110110001111101': 1, '1000011010000000': 1, '01011100111
10110': 1, '1111101100101101': 1, '1010111011111111': 1, '0110000010001011': 2, '001
0001111101001': 1, '1101011111010111': 1, '1110000111010001': 1, '1000001100001010':
1, '0000001100000010': 1, '0100001111011111': 2, '1011000000110100': 1, '11001010110
00011': 1, '1010000100010111': 2, '1010110111011100': 3, '0000101110011100': 1, '000
0011101010011': 1, '1101101000011010': 1, '1111110010000001': 4, '1011110010111010':
2, '0111001110011101': 1, '1001111011001110': 1, '0001101000011000': 1, '01001011111
01000': 1, '0011000100110110': 1, '0100010000001000': 1, '0011010101011100': 1, '100
1011111011111': 1, '0100001011110110': 1, '1010111101111011': 1, '0110000101111101':
2, '1000111010111110': 2, '0100111010101010': 1, '0100011111001110': 1, '10100100001
01111': 2, '1110100001011110': 1, '0110000100010000': 1, '0010100000010101': 2, '101
1110101001000': 1, '0010110110000100': 1, '0011100100000110': 1, '1000111101011011':
2, '0010100110010001': 5, '0001001110111010': 1, '1110100000011010': 1, '01110101111
00110': 2, '0111100001001110': 1, '0100101110000110': 1, '0010100010111000': 1, '011
1100001110000': 2, '0011000110000100': 1, '1101111011100010': 1, '1110010001100000':
2, '0000011110010111': 1, '0000001101110111': 1, '0011010000010011': 1, '10111101101
11001': 1, '0000111000101111': 1, '0010110101010111': 2, '0110010001101011': 2, '000
1101100011000': 1, '0001011010010110': 1, '1101010000110100': 1, '0101111111001110':
3, '0000101011110000': 2, '1010000100011000': 3, '1100001101101101': 1, '00010010101
11100': 1, '0011100100111010': 1, '1100011101001111': 1, '1001011001100000': 2, '110
1001011111101': 1, '0100101100100101': 1, '0001001100010000': 1, '0101110010011100':
1, '0110000111101100': 1, '0101111100100011': 3, '0110010001100101': 1, '01001111101
11010': 1, '0101001011101110': 2, '1100001001000100': 1, '0010100011101000': 1, '100
1111000001100': 1, '0111100000010110': 1, '0100111110000110': 1, '0000111100001000':
1, '0101110011010110': 1, '0010100011000000': 2, '0011010001001010': 1, '10101110011
10111': 1, '0011000011111011': 1, '0000001001101110': 2, '0000101000000010': 1, '111
1101000001101': 1, '0011011000101111': 1, '0011100101110011': 1, '1101100010110011':
1, '1111011010110111': 1, '0011100100100111': 1, '1011000111110010': 1, '11001100000
11111': 1, '0010100011111001': 1, '1111011000100101': 1, '0110000011111001': 1, '010
1110001110011': 1, '1111100111110011': 3, '0101011010000001': 3, '1110010011111110':
1, '1100011011010011': 1, '1000101100001111': 2, '1101001010111000': 2, '10100110100
10001': 1, '1010110101010011': 2, '0000011010101001': 1, '0101011011110011': 3, '001
1010000011010': 1, '0110010101001000': 1, '1000001010100010': 2, '0110110000100101':
1, '1100101100101110': 1, '1111100011111111': 2, '0111111110011011': 1, '10100101101
01101': 1, '1000101100001010': 1, '1001001110110111': 1, '1100111000000100': 1, '010
1010010001010': 1, '1000011101011011': 1, '1011110000101001': 4, '0001011010010011':
1, '0001111001010101': 1, '0110111001010000': 1, '1100111011101110': 1, '01010110010
11111': 1, '1100111001000000': 1, '0101001101111111': 1, '0010100110111000': 1, '101
1010010111001': 2, '0100001001010000': 1, '1010000011100001': 1, '0110110011010110':
1, '0010100010001110': 1, '1110100001000001': 1, '0110010010100011': 1, '11111000000
11110': 1, '0111110101011111': 1, '0000011100101010': 1, '1110010100000101': 2, '101

1010011001011': 1, '0111000111000011': 3, '1010100110110110': 1, '1010100001001010': 1, '0000001011010001': 2, '0100001101111001': 1, '0010100000000001': 1, '00111100011 11010': 1, '0101111101010000': 1, '0000001100010111': 2, '1100111001100100': 2, '100 1011010101110': 1, '1100101011011110': 1, '0000111111101101': 1, '0101001101101010': 1, '1100001111110111': 1, '1111100000001110': 1, '0011000101010100': 1, '10011011101 11111': 1, '0101001000110010': 1, '0111010011111000': 2, '0111110101011001': 1, '010 1001011101011': 1, '1001001100001010': 1, '0101001000001110': 1, '00100101010011111': 1, '1111101110110010': 1, '0111101010010001': 1, '0101111101000111': 1, '11101100001 00000': 1, '0101111111100001': 1, '1110110001011000': 1, '0101111101011111': 1, '011 1110110101100': 1, '1111010100000011': 1, '1101000110010011': 1, '0011110110000001': 1, '0000111100100101': 2, '1011100000010010': 1, '0001011100101110': 1, '01110000111 11011': 3, '0010110000111001': 1, '0100001101101000': 3, '1000101000111101': 2, '011 1010100101111': 2, '0110100111110011': 2, '0011110000011100': 1, '1101100010010110': 1, '0110100001111000': 1, '1110110001100100': 1, '0110011011011100': 1, '00000111000 01111': 1, '0010000100011010': 1, '1001111010100100': 1, '0101010010111011': 1, '111 1000011101110': 1, '1110010001011101': 1, '0000001010100101': 1, '0011110100001100': 2, '0111110111000000': 1, '1101011001000001': 1, '1111000001010101': 1, '11011011010 00101': 1, '1010110010101101': 2, '1011100101101100': 1, '1101011111110101': 1, '111 0000001000100': 1, '1100111001001001': 2, '1111110111101111': 1, '1010001101011101': 1, '0011010010110000': 1, '1101010010001101': 1, '0100101110010110': 1, '10101000011 11011': 1, '0101110000001001': 1, '0011000111001010': 1, '0100101001110001': 2, '100 1001000111000': 1, '1011000100110001': 1, '0011010010010101': 1, '0011000010001101': 1, '0100001100000001': 2, '0100111011001111': 1, '1101010010000010': 1, '01010011010 00100': 1, '0101100101011100': 1, '0001111111010110': 1, '1101001011110010': 2, '011 1100001110011': 2, '1000001000011101': 1, '0000101000001000': 2, '1100101101001001': 2, '0110000100100001': 1, '0011110010011101': 1, '1010100001010010': 1, '11010110111 11101': 1, '1101101001110100': 2, '0000010111011101': 3, '1001011010010111': 2, '100 1101010000011': 1, '1001011010010011': 1, '0100101000111000': 1, '0110100101111000': 2, '0101111011010101': 1, '1010000110000101': 1, '1011100000111101': 1, '01110000011 11011': 1, '1111011100010110': 1, '0000000111100001': 1, '1101010110110011': 1, '111 0000001100001': 1, '0000101010001011': 1, '0101101101111110': 1, '0101011001111111': 2, '0010100000000011': 2, '0000001110110110': 1, '0111110111001001': 1, '00100101001 00001': 1, '1110000110110100': 1, '0001111000011011': 1, '1000101011010110': 5, '100 0011111001000': 1, '0101001101001111': 1, '0100001001101100': 1, '1110110101111001': 1, '0011010010111000': 1, '1000111101000010': 2, '1001101110001001': 1, '10011010100 10101': 1, '1110000110000110': 1, '1111100000010010': 2, '0110100101000001': 3, '010 1111011001001': 2, '1011000010111111': 1, '0111100011010011': 1, '0000111101011111': 1, '1111010001100101': 1, '0010100000001001': 1, '0000011101000011': 1, '00000010010 00010': 2, '1100111011001100': 1, '0101110011001011': 1, '0111110101110000': 1, '011 1100011111011': 1, '1011110100001000': 1, '1011110110001110': 1, '1010100000101000': 1, '1011000111100100': 1, '1001100101000010': 1, '0010111011100010': 1, '01110000010 11000': 1, '0101011111001000': 1, '0011101100110000': 1, '0000101001011000': 1, '101 1110001100000': 1, '0101011100001111': 1, '1100101100001101': 1, '0110010000100101': 1, '1010010000010111': 1, '1111110100000011': 1, '1100011001100110': 2, '10111100001 00011': 1, '1010100010010100': 1, '0010010010100000': 1, '0000001010011111': 1, '000 0110000010000': 1, '0101001101100111': 1, '1010100010011011': 1, '1111001010011111': 1, '0100101100101011': 1, '0111011000100001': 1, '0100111101011011': 1, '10101101001 11110': 1, '1111111000101111': 1, '1001011100000000': 1, '0010100000101101': 1, '100 1011110111011': 1, '0100101001000101': 1, '1000011111100000': 1, '1101001010110011': 2, '1001011010010101': 1, '1011010010100001': 2, '1110000100100100': 1, '10100011010 01001': 1, '0010111010011001': 1, '0101001001000010': 1, '0101111111000111': 1, '101 1110011010110': 1, '0110110000100100': 1, '0000001011010010': 4, '0101111100101111': 1, '0010010000111110': 1, '0011000100110000': 2, '0010100001100010': 2, '11101100111 10010': 3, '1011010111011100': 1, '1100001111011111': 1, '1101001101011111': 1, '000 1001010010011': 1, '1101011101101011': 1, '1011110000010101': 1, '0110100001100011': 1, '1010100100011111': 1, '0100011111011101': 1, '1111000000100110': 2, '11100100111

11001': 1, '0000001101010110': 1, '1011100111101001': 1, '0101101111100010': 1, '010
0111001100010': 1, '1101111111110110': 2, '0000101010110111': 2, '1010000100101010':
2, '0111011010000011': 1, '0001101111010110': 1, '0001001100110010': 1, '00001111100
01110': 1, '0101011101011111': 1, '0100111001101001': 2, '0101111110011100': 1, '001
1010001110000': 1, '1111000011000110': 1, '1100011000100001': 1, '1101001110101101':
4, '1010100011110100': 1, '1000101011001001': 1, '1000101100000111': 1, '01111111000
10101': 1, '0000011010101100': 1, '1010010100111100': 1, '0000111110100011': 1, '100
0000111110101': 1, '0111000011110001': 1, '0001101111010111': 1, '0000011100010000':
1, '0111001110010011': 2, '0111000001011100': 1, '0011110010001101': 1, '00110001111
11111': 1, '0011100110010011': 2, '0111110111100010': 1, '0001111010000111': 2, '110
0101111111111': 3, '1000011111010100': 1, '0001101011001101': 1, '1101000110101000':
1, '1111110011100000': 1, '1000111110100111': 2, '1100101000100001': 1, '01100001110
11111': 1, '1110010101101100': 1, '0101011111111010': 3, '1001101101100101': 1, '101
0111011001010': 1, '1101001010001101': 2, '1110000100011100': 1, '1010101111111110':
1, '0101110010001101': 1, '1000101100001110': 1, '0001011110001100': 1, '11010111100
00100': 1, '1000001010001111': 1, '0000101001010011': 1, '1111000011110010': 1, '000
0000111011010': 2, '0011110110110110': 1, '1100010001000000': 1, '0110000111011010':
2, '1001011100011100': 1, '0110000101111111': 1, '0000011111100001': 2, '00101001000
10011': 1, '1000011101000110': 1, '1111100110101001': 2, '0001101000110000': 1, '101
0010110100110': 1, '0110110111010111': 1, '0001111011101110': 1, '0101111001111011':
1, '1101111001100000': 1, '1011010001010000': 1, '1111000011001000': 1, '10000111100
10011': 1, '1111001110010001': 1, '0001101000100111': 2, '1010100000001011': 1, '100
1101001010010': 1, '1110110001011101': 1, '0000010001000101': 1, '1011110010010011':
1, '0101001101010011': 1, '1100011111111111': 1, '1111010111011010': 1, '10001110101
00101': 1, '1111110111110101': 1, '0000010000000110': 1, '0000010101111000': 1, '010
1001001010101': 3, '0111001100100001': 1, '0001101011100011': 1, '0010100100101111':
3, '0110110001001000': 2, '0100111111000010': 2, '1001111110100011': 1, '01101001011
00010': 2, '1111010111010001': 1, '0111110111100000': 1, '0011110011111111': 1, '100
1011100100001': 1, '1100101111000111': 1, '1001101000010000': 1, '1011100111110011':
1, '0010000001110101': 2, '1001001000011001': 1, '1010000110010000': 2, '00010110111
11111': 1, '0100001101110110': 1, '0101001000110111': 2, '1111000111101101': 2, '010
0011101100111': 1, '0011001100101111': 1, '1101101001111000': 1, '0111000001011001':
1, '0101100100100001': 1, '1111100011111000': 1, '0111110101010100': 1, '10000111110
00101': 1, '1010110100110101': 1, '0110110001001001': 1, '0010111011100111': 1, '101
0101111101001': 1, '1011110000101011': 1, '1001011010101101': 1, '0101111100111011':
1, '0011110010010011': 1, '0111111011000111': 1, '0011100100010001': 2, '01100001010
00111': 1, '1100001111000110': 2, '1100001101101001': 1, '0110000101111011': 1, '111
1110101010011': 1, '0110000101100010': 1, '0010000011010101': 1, '0101001001001110':
1, '0001001110010101': 1, '0011110100000110': 1, '0100101101100110': 1, '10011011100
01101': 2, '0010000110000101': 1, '0101011010100001': 2, '0001001111010100': 1, '000
0011000010010': 1, '0001011110000110': 1, '1010001111000101': 1, '0101001011010010':
1, '1000011001111111': 2, '0011100111001100': 1, '1011100110001011': 2, '01011001100
01111': 2, '0111000101000000': 2, '0111010011000101': 1, '1011010000110000': 1, '000
1111011101011': 1, '1101101011001110': 1, '1010110000100111': 1, '0010100010001001':
1, '0111100010111001': 1, '1001101010010001': 1, '1101101011110011': 1, '00001100011
01110': 1, '1100001100011000': 1, '1101110000111011': 1, '1100111100000111': 1, '001
1000110000111': 1, '0111010100010011': 1, '0011100111011011': 1, '1011110000001111':
1, '1100001110010000': 1, '1110000011010001': 1, '0111001010011011': 1, '11010010100
11010': 4, '1011100010000101': 1, '0001111001110110': 1, '1100111000110101': 1, '011
1010110000000': 2, '0111000011010101': 1, '1000001110100001': 1, '1101101001111011':
1, '0111000011001001': 1, '0101001111100110': 4, '1011110010001110': 1, '01011100101
01110': 1, '0010100011000001': 1, '1100111011111110': 2, '0100010001001100': 1, '011
1110111010001': 1, '0101000110000011': 1, '1100001110000111': 1, '1000011100001000':
1, '0011100010111011': 1, '1000001010100001': 1, '1000011100111111': 1, '01000111111
10001': 1, '0101001001000100': 1, '0010100100011100': 2, '0000001010100000': 1, '011
1000011110101': 1, '0101111111100100': 1, '0000101010110001': 2, '1111100101111010':

1, '1010100100001010': 1, '0011010100000011': 1, '1111000011110011': 1, '00100001101 01100': 1, '1101111001100100': 1, '1100001101100110': 1, '1001101110011100': 1, '000 0001101010101000': 3, '0111101111110110': 1, '0000001100100101': 2, '1011110110111110': 1, '0111100000010011': 1, '1101001101110110': 1, '1100111111101011': 2, '01010011111 10100': 1, '0000110011010111': 1, '0010000001001110': 1, '0100101101011110': 1, '100 1001110001000': 1, '1100101101010100': 1, '0110010010101110': 1, '1100001111011100': 1, '0010101010000010': 1, '0110010001100011': 1, '0110100111110001': 1, '00001010011 01111': 1, '1111110100111100': 4, '1101110010000110': 1, '0110110001111000': 1, '110 1101001100010': 1, '1100111000010101': 1, '1111000011011010': 1, '0010001111101011': 1, '1111100101101110': 2, '1011010111011110': 1, '0100011110100011': 1, '10100101110 10101': 1, '1010000000010110': 1, '1000001110011010': 2, '0101011100110010': 2, '011 0110001000001': 1, '1111110101001111': 2, '1101011001110111': 3, '0111001000110010': 1, '0110010101101100': 1, '0011010011110111': 1, '1100001110100011': 1, '01011111111 11111': 1, '0100101011011000': 1, '1101011111000111': 1, '0010100110110101': 1, '101 0100100010011': 1, '1111010111101011': 1, '1011111010110111': 1, '0101010100000001': 1, '0011100000110100': 1, '1101110100001101': 1, '1010100110111001': 1, '01101001010 01111': 1, '0110110000100111': 1, '0001011001111100': 1, '0001011100101101': 1, '010 1111011100000': 1, '0111011011010110': 1, '1011010110100010': 1, '1010010110110101': 1, '0010000101011111': 2, '1010010010100001': 1, '1111100000000110': 2, '11100000110 11011': 1, '1101101000111010': 2, '1001101100110111': 1, '0000110001100000': 1, '001 1010000110100': 2, '0110111001010100': 1, '1010110010101100': 2, '0110010000101000': 1, '1011000101110000': 1, '0111001000101000': 1, '0110000011111111': 1, '10001000001 11101': 1, '1010000001010011': 1, '1001111100100010': 2, '0101000100000001': 1, '111 1100010111000': 1, '1010000001101110': 1, '0110000110011110': 1, '1010100110011011': 1, '0001111111011111': 1, '1100101100100000': 1, '1000001001111010': 1, '00011110011 11000': 1, '1110010000101001': 1, '1110010111110110': 1, '0111110111010111': 1, '101 1100100110001': 1, '0011010011010111': 1, '1010010111011001': 1, '0110000101110100': 2, '1100011011001101': 1, '0011010000011110': 1, '1101011100000111': 1, '00101100000 01011': 1, '0000001001001010': 1, '0110110001000010': 1, '0110010110111111': 1, '011 1100000000111': 1, '1110010111110101': 1, '0010010000011110': 1, '1110010011001110': 1, '1000011110101001': 1, '1010000001100010': 2, '1001101110101010': 2, '01011111110 10011': 1, '0110110111001110': 2, '1010100001001011': 1, '1100101100101100': 1, '011 0000101110011': 1, '0100111011000010': 1, '0110110011111011': 2, '1000100111010111': 1, '1111111010010101': 1, '0000011100011111': 1, '0110110111110111': 1, '11111011000 00111': 1, '0001101100101001': 1, '1110000100111100': 1, '0101110011110100': 1, '001 0110010101001': 1, '0111100010111000': 1, '1001001011010000': 1, '0011000010100110': 1, '1101011011110101': 1, '0011100110111000': 1, '0110000100011101': 1, '11100100111 01001': 1, '1111110011111100': 1, '0111000111010001': 1, '1000011010000100': 1, '110 1101011110101': 1, '0101101101101010': 1, '1000001000101001': 1, '1011010001111000': 2, '0100101001011011': 1, '1101011001000110': 2, '1011110010110001': 1, '00010110101 01000': 1, '0100111101100110': 1, '1001111100100001': 1, '1101011001001110': 1, '111 1110011111000': 1, '1100001001100101': 1, '1101000110111000': 1, '0000110001110101': 1, '1011000010101110': 1, '0000011101111111': 1, '1110010111010111': 1, '11011110010 01101': 1, '1010001111010011': 1, '0111010001101000': 1, '0101111111000110': 1, '100 1101000111100': 1, '1010100100111011': 1, '1001011011000111': 1, '1000110011100110': 1, '1100111010110110': 1, '1010000010111011': 1, '0000000101000000': 1, '11010010011 11100': 1, '0101111111000010': 1, '0010010101101001': 1, '0101001001101000': 1, '100 0011101010011': 1, '0011110010111111': 1, '0010111111111111': 1, '1100001001001010': 1, '0100101101111101': 3, '0110010000010110': 1, '0001111110011011': 1, '01101100000 10000': 1, '0000011110000101': 1, '0110100001111011': 1, '0010010110001101': 1, '101 0110000101010': 1, '0000101010110110': 1, '1111110100001010': 1, '1101101101110110': 2, '1011000011110101': 1, '1010100010000010': 1, '1101011011001101': 1, '10010111111 10011': 1, '1101101010001100': 2, '1000001010101010': 2, '0111010000001111': 2, '101 1110100001001': 1, '0111011011110010': 1, '1101101001110011': 1, '1101010101111100': 1, '0010000101010011': 2, '0001101101001101': 1, '1000001010111001': 1, '01000111010 11011': 1, '1101111100101000': 1, '1010110010001101': 1, '1110000001111011': 1, '101

1010000100100': 1, '1011110100110111': 1, '1100111010101111': 1, '0111100000010111':
2, '1100101001000001': 1, '0010101101011100': 1, '0010000000110001': 1, '01111101101
01001': 1, '1101101001100100': 1, '0100101101111011': 1, '0111000000101101': 1, '000
0110101000101': 1, '1010010110001000': 1, '0101111111010100': 1, '1110000111110111':
1, '1111000101101011': 1, '1000101110000100': 1, '0110100110100010': 1, '00000111101
01101': 1, '1100011011001010': 1, '1101010001111101': 1, '1001001010110000': 1, '100
0100111000010': 1, '0110110011111100': 2, '0111010001011010': 1, '0101001000011010':
2, '0010001101000100': 1, '1011010010011010': 2, '1010010111101011': 2, '10110001111
10110': 1, '1110110011100010': 1, '0111000010101100': 2, '0111000001110010': 1, '000
1011000100110': 1, '0111000000100010': 1, '1001001110000101': 1, '0111111000111000':
1, '1010000010001100': 1, '0101100110100000': 1, '0110110101101010': 1, '01001010111
11110': 1, '1011100000101000': 1, '1000001000111000': 1, '0100011010110111': 1, '111
0000110101111': 1, '0111111110100011': 1, '1101111110011100': 1, '0111001000110001':
1, '1110110101100000': 1, '1100001101110101': 1, '1111110111010011': 1, '01010100001
00001': 1, '1101001011101011': 2, '1011000010010111': 1, '1111100111000001': 1, '010
1110100110101': 1, '0001001110110100': 2, '1001011010100000': 1, '00000010010011 11':
1, '1000111101100111': 2, '0101010010100011': 1, '1110000011110111': 1, '01111101111
01101': 2, '0111110101011010': 1, '1100011001111011': 1, '0100001100011100': 1, '100
1111110001111': 1, '0111111010100100': 1, '1110110001110101': 1, '1110010010000100':
1, '0100101001100010': 1, '1001011010011011': 1, '0111010000011110': 2, '00111000011
01000': 1, '1101101011101100': 1, '1100011011110110': 1, '1101001010111101': 1, '111
0010001101001': 1, '1010110000000000': 2, '1010010100000110': 1, '1111000010010001':
1, '0110100111111010': 1, '1001011110110001': 1, '0001111011001000': 1, '10111000100
01110': 1, '1010001101110010': 1, '0111111000111111': 1, '0100101111101101': 1, '100
0011111011101': 1, '0001101011011010': 2, '1010110000000011': 1, '1111010001010011':
1, '0110110001110010': 1, '0001111010101010': 1, '0000101000101111': 1, '01001110111
10100': 1, '1010000110010111': 1, '0000111101011110': 1, '1101011100010010': 1, '001
0000010111010': 1, '1101101001011100': 2, '0111010011110111': 1, '1001001010101011':
1, '0110010011100100': 1, '0010100110001000': 2, '1110010010001011': 1, '00100110000
01001': 1, '0101101011111111': 2, '1101010011101001': 1, '0001101010011110': 1, '101
0100000011000': 1, '0100101010000101': 1, '0111100000000110': 2, '0001001010101000':
1, '1000111111111000': 1, '1010000110100000': 2, '0000011000111010': 1, '00000010100
00101': 1, '0101001001011101': 2, '0010100001011110': 1, '1111010111111101': 1, '101
0110111111101': 1, '0011000101001011': 1, '0110110111110010': 1, '0100111011100010':
1, '0010001001011001': 1, '1000101011010001': 1, '0001111011011001': 1, '11001010011
00001': 1, '0000101000000110': 1, '0110110000101111': 1, '1011010100001100': 1, '110
1001101011011': 1, '1000111110111111': 1, '0010000110111001': 2, '0111010111100101':
1, '0011000100110100': 1, '0001011010001101': 1, '1110100110010100': 1, '11011010110
10110': 1, '0000001001000011': 1, '1011000111111111': 1, '0111010110100100': 1, '111
0100111000100': 1, '1100001110010011': 1, '1100111001101111': 1, '0101011111110000':
1, '0100111000110101': 1, '1101101001010000': 1, '0000000011110111': 1, '10011010100
10000': 1, '0000101001011011': 1, '0110010011100000': 1, '0100101101000011': 1, '101
0000100001111': 1, '1111000101000111': 1, '1100101001101001': 1, '1111000111010001':
1, '0011010010010001': 1, '0011010000000011': 1, '1011010100111000': 1, '10111100100
10100': 1, '0111001100000100': 1, '1100001110100110': 1, '1011000100010101': 1, '000
1101110111001': 1, '0110000111010111': 1, '1101001101000101': 1, '1101001101111110':
1, '1110110111000110': 1, '1001101010101010': 1, '1010010110110110': 1, '10110011111
10001': 1, '0100111000001101': 1, '0000111110011011': 1, '1001011110011100': 1, '110
1011001000011': 1, '1111010111001000': 1, '1100011011001001': 1, '1100111011111000':
1, '0000011100010010': 1, '1001101110000001': 1, '0110110000000001': 1, '11111101001
10110': 1, '0010000101110110': 1, '0001001100010010': 1, '1101111111001001': 1, '001
1110001111000': 2, '0110110011000110': 1, '0101111000110111': 1, '1100001111111100':
1, '0011010001011101': 1, '0111110111010011': 1, '0000001110111111': 2, '11011010111
10111': 1, '0011100000010101': 1, '0101100111010111': 1, '1000001001101010': 1, '000
0001000001110': 1, '0010001101101101': 1, '1010100001110010': 1, '0011010011110010':
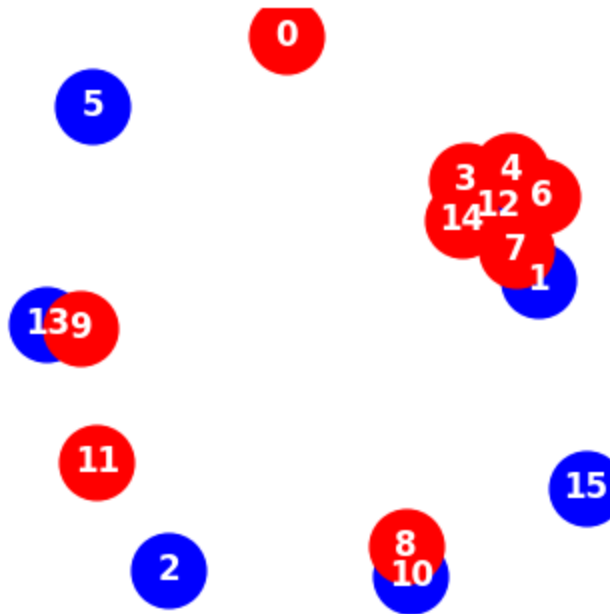2, '0010000000001001': 1, '0001011011111010': 1, '1101101000101110': 1, '11011011010

01101': 1, '1111100001110110': 1, '0001101011111110': 1, '1101101000111111': 1, '111
1100011001110': 1, '0001001010101011': 1, '1100101110101010': 1, '1001001101001100':
1, '1011110100100001': 1, '0011010000111111': 2, '1111100010100001': 1, '10110011101
01111': 1, '1001111000011111': 1, '1101111001111010': 1, '1001011001011001': 1, '100
1001111001010': 1, '0111100001000110': 1, '0101101101110010': 1, '0010110111101111':
3, '1111010111111110': 1, '1001111111111111': 1, '1011001100000100': 1, '11011010111
10100': 1, '1001101010110110': 1, '1000110100001001': 1, '1001101101010001': 1, '110
0101100001000': 1, '1111010111110111': 1, '0010110010010000': 1, '0010110000100110':
1, '0101011101101101': 2, '0000001000111101': 1, '1010010110011010': 1, '11100100001
10001': 1, '1111000111001100': 1, '1101101101111110': 2, '0110000100000100': 1, '001
1110010011010': 2, '0011010110101010': 1, '0000111100101101': 1, '0000011000111111':
2, '1011000000101101': 1, '1100101001011000': 1, '0010100001000011': 2, '00010111100
10010': 1, '1110010000001101': 1, '0010100001000111': 1, '1000011010111110': 1, '100
0011100111101': 1, '1111001000111100': 1, '1101111100110001': 1, '0111100101101001':
2, '0010100011111100': 1, '0010110010011111': 1, '0110010001100111': 1, '00001111100
01100': 1, '1100001110011010': 1, '0101011110111100': 1, '0111010011011000': 1, '010
0001101100000': 2, '0111111101100000': 1, '0111111000111011': 1, '1010010111110000':
1, '0010110010110001': 1, '0101100110100110': 1, '1010000010110010': 1, '00111101011
10000': 1, '0100011101101101': 1, '1101101111110000': 1, '1010111001010011': 1, '110
0111010001001': 1, '0000001001001110': 2, '1001101111010010': 1, '0111101010001011':
1, '0001101010011101': 1, '0010111011100110': 1, '1110110111010010': 1, '01010111001
11011': 1, '1111010111100001': 1, '1000010011100000': 1, '1101011001000101': 1, '111
0110010010011': 1, '1010010000101110': 2, '1101101011111010': 1, '1010110100010111':
1, '0101101111110101': 1, '1101011111000110': 1, '0001111010010010': 1, '00011010100
10110': 2, '1101011111111010': 1, '1010110100001100': 1, '0100111011011001': 1, '011
0010011001100': 1, '1101000110000101': 1, '0001101101011101': 1, '1000111111001100':
1, '0100001000011101': 1, '1110110001001110': 1, '1010010101101011': 1, '00001110101
10111': 1, '0111111110111110': 1, '1001111110001010': 1, '0111100001111101': 1, '010
0011010100111': 1, '0001101111101110': 1, '0110100111001111': 1, '0110100111110010':
1, '1010101111110000': 1, '1100101111011101': 1, '0010000001110011': 2, '10000111000
10001': 1, '1111000011111011': 1, '0011100110001111': 1, '0100011001010010': 1, '001
1010001010001': 1, '1100001001000101': 1, '1001011100111000': 1, '1101010000010101':
1, '0001101110110010': 2, '1000010110110010': 1, '0111100010001001': 1, '10101000111
01000': 1, '0001111011010110': 1, '1110000001100100': 1, '1000101000101110': 1, '101
1100110110001': 1, '0111110101111110': 2, '0100101111100000': 1, '1000011110001111':
1, '1110010001011010': 1, '0111001000101011': 1, '0010100110110111': 1, '10100000101
00101': 1, '1100001001101111': 1, '0010000000110011': 1, '0101011111010000': 1, '111
0000011000111': 1, '0000100111001010': 1, '1010010110011100': 1, '0010011010000010':
1, '1110010111101100': 1, '1111110101011101': 1, '0011101111000001': 1, '00001010001
11000': 1, '0010010100001001': 1, '1100101101010110': 1, '0001111010100111': 1, '011
0110110011011': 1, '0101101101001001': 1, '1010000011000001': 2, '0010110010110000':
1, '0011010011011011': 1, '0011101110101111': 1, '0000011100000010': 1, '11010010001
11010': 1, '0000100101011000': 2, '1010010010011100': 1, '0111010100110011': 1, '000
1111010010001': 1, '0110100101000010': 1, '0010100110001001': 1, '0001101110110001':
1, '1110000011100110': 1, '1011000000101110': 1, '1010000001111110': 1, '01000010010
01000': 2, '0100111101100100': 1, '0111010011111001': 1, '1000001101010111': 1, '110
0001001110100': 2, '0011000110100010': 2, '1110000110001000': 1, '1011110100011001':
1, '1101011011100001': 1, '1000011100010100': 1, '1100011011001111': 1, '00010111001
00011': 1, '1111110111101110': 1, '0110000111111100': 1, '0011110011010010': 1, '001
0000110111100': 1, '1100100111011100': 1, '0101011111111100': 1, '0000010000101101':
1, '1000100111010010': 1, '0111010110111001': 1, '0111000010100000': 1, '01110101000
01110': 1, '0001111011001011': 1, '1100011011111110': 1, '1101100110111111': 1, '100
0000110111000': 1, '0000101110100100': 1, '1010000001111010': 1, '0001101100000100':
1, '1010011001000011': 1, '0111000010000001': 2, '0110010111010110': 1, '01011011111
01001': 1, '1110100110111011': 1, '1101101001011111': 1, '0000001110100101': 1, '100
1011100110001': 1, '1110110101100100': 1, '1001101001011100': 1, '1001011011110110':

1, '0110010101100001': 1, '1011100000011101': 1, '1111110110001000': 1, '01001110011
10101': 1, '0011010011101111': 1, '1010110010010010': 1, '0101011111010011': 1, '100
0111110110100': 1, '1010101111001111': 1, '0100011000001011': 1, '1101110010000111':
1, '0011100110001001': 1, '1010011010001010': 1, '0000101000100110': 1, '10101001001
01110': 1, '0010111000000100': 1, '0100111000000111': 1, '1111010001011010': 1, '001
0101101000011': 1, '1000011000011000': 1, '0100111011001101': 1, '1000111111111001':
1, '1010111011011110': 1, '0011110011110111': 2, '1111110011100111': 1, '10100100100
01101': 1, '1101001011110001': 1, '1001001110110001': 1, '1101001010010100': 1, '001
1110110010111': 1, '1011010001101101': 1, '1000101010100000': 1, '1111000100001111':
1, '0101111111101001': 1, '0100101100100000': 1, '1101011100000011': 1, '11001110100
01000': 1, '1010100000111001': 1, '0011110010000111': 1, '1000101011111011': 1, '001
0001011111101': 1, '0110000101001111': 1, '0010010000101110': 1, '0001111000110101':
1, '1110010111111000': 1, '1111010110011100': 1, '1010000001100011': 1, '10011011000
11000': 1, '0110110010111110': 1, '0101010010000101': 1, '0100111001010110': 1, '001
1010110010011': 1, '0101011111110110': 1, '0011110010010000': 1, '0111000011011010':
1, '0110010010100010': 1, '0000011000000010': 1, '0100101101100111': 1, '00001011000
10111': 2, '1001001010101111': 1, '1010111010001111': 1, '1100001011101101': 1, '001
0110010100000': 2, '0101010010111010': 1, '0011100101010111': 1, '0001001101110101':
1, '1100111100001110': 1, '1101010010010110': 1, '1100111001110110': 2, '11101100101
10010': 1, '0111010100010010': 1, '0011010011111010': 1, '0101111101110001': 1, '010
1001101000011': 1, '0111001100010101': 1, '0101101101100111': 1, '1000011110111010':
1, '0000100111001111': 1, '1000111000000010': 1, '0100111011011010': 1, '10010011101
00001': 1, '1110010111110111': 1, '1111101100110010': 1, '1101101011101111': 1, '101
1000101011100': 1, '1000111111101100': 1, '1010000010010110': 1, '1000001100000011':
1, '1000110111001001': 1, '0100011111110010': 1, '1001001000001011': 1, '11111010000
10100': 1, '0011100001110101': 1, '1000001110010000': 1, '1110110011100000': 1, '100
0110000000000': 1, '1000110011010110': 1, '0101110000111000': 1, '0011110110101011':
1, '1110110010111010': 1, '1101101011111110': 1, '0010010000010011': 1, '01011101101
00111': 1, '1010101111010011': 1, '0111111110111010': 1, '0101111110111100': 1, '011
1111000110000': 1, '1011010000110110': 1, '0111100011111010': 1, '1001111100110100':
1, '0010110100000000': 1, '1110110001010010': 1, '1010000110100101': 1, '01000111111
00111': 1, '0011000100111011': 1, '0001010010011000': 1, '1100011000010100': 1, '000
0011000001010': 1, '1000011101100010': 1, '0110110011110100': 1, '0010010010011011':
1, '1101000110001111': 1, '1000101010100100': 1, '1011010010000101': 1, '10100101010
00111': 1, '0101111110100000': 1, '1101101011100010': 1, '0001111110101110': 1, '100
0011111011001': 1, '0001111010101111': 1, '1011000001010000': 1, '1100111101010110':
1, '0000010000000000': 1, '0110000111110101': 1, '1111100000111110': 1, '11110000110
10001': 1, '1111001100101100': 1, '1010100110011101': 1, '1100001101010100': 1, '010
1011110011100': 2, '1001111010011010': 1, '0010110111100101': 1, '0010101111000100':
1, '1000000011110000': 1, '0011010000100010': 1, '0011000010010001': 1, '00011110101
01000': 1, '1011110101110100': 1, '0111111001001101': 1, '0010101110100100': 1, '111
1000011101111': 1, '1001111010100011': 1, '1000001010110010': 1, '0011000110111001':
1, '1100001001101000': 1, '1100111101110010': 1, '0111100111100000': 1, '00100001001
11111': 1, '1000111110000110': 1, '0100101101110101': 1, '1011110011001010': 1, '001
1000100001010': 1, '1001011110110010': 1, '0001001110010100': 1, '0101101100001111':
1, '1100001111011010': 1, '0100101110101010': 1, '1000111101111111': 1, '10001010111
01001': 1, '0111100001001100': 1, '0001001100010011': 1, '1010010110101011': 1, '011
0100100111000': 1, '1011010010000100': 1, '0100101100010100': 1, '0100001111011011':
1, '0100001111010010': 1, '1011010100111100': 1, '0000000110101110': 1, '10010111001
11100': 1, '0110010101010000': 1, '1000111000011110': 1, '1100001110010110': 1, '010
1001011010000': 1, '0100111110001000': 1, '0001101110100111': 1, '1111001101110101':
1, '0011100111001010': 1, '0110011111110110': 1, '0100111001011110': 1, '11001110101
01011': 2, '1001101000000010': 1, '0000001001010110': 1, '0101110010100000': 1, '100
0111000110110': 1, '1010110010011100': 1, '0011010010001001': 1, '1111000011010100':
1, '0100111010111101': 1, '0011110001011010': 1, '0000010011011110': 1, '11010111001
10011': 1, '0110010001101101': 1, '1011100100011111': 1, '1001001101000100': 1, '111

0110101110101': 1, '0111110100110111': 1, '0101000110001110': 1, '0010101100111100': 1, '1010001110101100': 1, '0101101111111101': 1, '1111001110001010': 1, '11111101100 10001': 1, '1001101100111010': 1, '1011110010111000': 1, '1010111011110011': 1, '101 011101111110111': 1, '0100101111000000': 1, '1000110100101001': 1, '1110100111101000': 1, '0000011111000001': 1, '0010100100100001': 1, '1110000100101011': 1, '01101100010 00101': 1, '0101111110101000': 1, '0100011000001000': 1, '1010010110001110': 1, '011 1010011001100': 1, '0111100011110111': 1, '0011000001011001': 1, '1110000100101001': 1, '0101100000111101': 1, '0110100111110100': 1, '0010000110010001': 1, '01111101010 01010': 1, '0100011101000001': 1, '1010100110011111': 1, '0110010000011101': 1, '111 011110001111': 1, '0010000000100111': 1, '1111100111011001': 1, '0111110101010010': 1, '1111000011000010': 1, '0001011011011000': 1, '0101011001000100': 1, '10111101101 11010': 1, '1000101100101111': 1, '0001001111010101': 1, '0100111101110101': 1, '001 0000100110010': 1, '1001001000001111': 1, '1100011010101110': 1, '0000111000101011': 1, '1001001111101001': 1}

In [76]:
```python
# comment this out for challenge 2 and 3

interpret_solution(H, best_bs_H)
print("Cut value: "+str(compute_cut_size(H, best_bs_H)))
print(H, best_bs_H)
```



```
Cut value: 8
Graph with 16 nodes and 8 edges 1001101111010010
```

In [77]:
```python
# comment this out for challenge 2 and 3

interpret_solution(graph, best_bs_H)
print("Cut value: "+str(compute_cut_size(graph, best_bs_H)))
print(graph, best_bs_H)
```
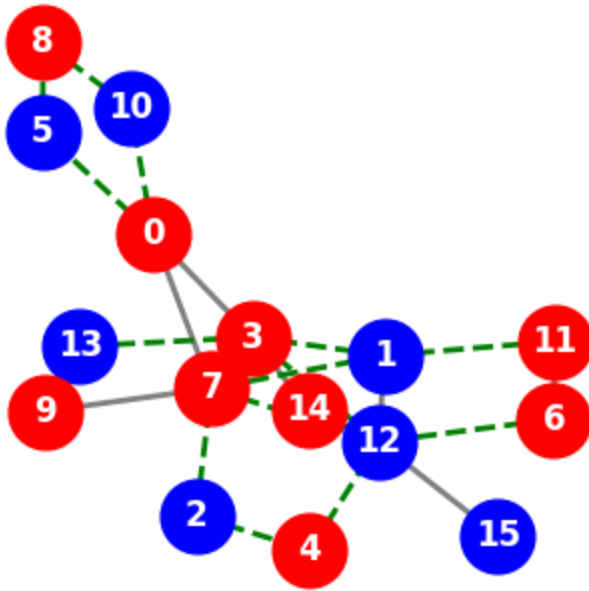
```
Cut value: 16
Graph with 16 nodes and 23 edges 1001101111010010
```

In [78]:
```python
# comment this out for challenge 2 and 3

# choose the better result from best_bs_T and best_bs_H
best_bs_final = best_bs_H if compute_cut_size(graph, best_bs_H) > compute_cut_size(
final_cut_value = compute_cut_size(graph, best_bs_final)

# choose the better result ansatz from ansatz_T and ansatz_H
ansatz_final = ansatz_H if compute_cut_size(graph, best_bs_H) > compute_cut_size(gr

interpret_solution(graph, best_bs_final)
print("Cut value: "+str(final_cut_value))
print(graph, best_bs_final)
```
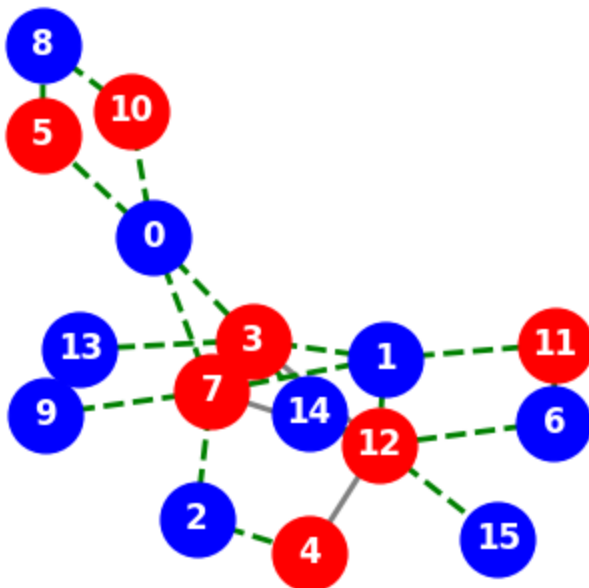
```
Cut value: 19
Graph with 16 nodes and 23 edges 0001110100111000
```

In [79]:
```python
# from qiskit_aer import AerSimulator

# shots = 100_000

# # Sample your optimized quantum state using Aer
# backend = AerSimulator()
optimized_state = ansatz.assign_parameters(qit_evolver.param_vals[-1])
optimized_state.measure_all()
counts = backend.run(optimized_state, shots=shots).result().get_counts()

# Find the sampled bitstring with the largest cut value
cut_vals = sorted(((bs, compute_cut_size(graph, bs)) for bs in counts), key=lambda
best_bs = cut_vals[-1][0]

# Now find the most likely MaxCut solution as sampled from your optimized state
# We'll leave this part up to you!!!
most_likely_soln = ""

print(counts)
```

{'0001001010100110': 15, '0101010001111111': 1, '0101111100000001': 155, '0000010000
110111': 1, '0101101000010001': 1, '0011000001001010': 100, '1010011111001010': 1,
'0010100000101000': 9, '0011010011101011': 1, '1000111101101000': 2, '10101101001010
01': 20, '1111011010100011': 4, '0100001000110111': 2, '0111100100011100': 32, '0110
100001111100': 30, '0111110010100101': 4, '0101011010100110': 2, '0100010011000011':
20, '0111001000110010': 1, '0011111101100001': 1, '0001001010010110': 55, '101111101
0011101': 1, '1110010101010001': 4, '0101011110100011': 152, '1110110101100001': 95,
'1100011001100001': 33, '1110010101011001': 4, '0001000010111110': 18, '110000101111
1110': 99, '0001101110100110': 1, '1111111010000011': 1, '0011111101101001': 8, '000
1000101110111': 1, '1100001100110111': 4, '0011100101001000': 128, '011011101110110
1': 1, '1110000100011010': 13, '1100100010111100': 1, '0011000011001000': 3, '110001
1111010110': 13, '1001111010111101': 8, '0111001110011110': 3, '0101001110110110': 5
3, '1110010000000011': 15, '0101001001001010': 7, '0010110101101000': 1, '1100101011
100011': 1, '1100110001010101': 4, '0001110010100011': 10, '1011100000101000': 21,
'0011110111010101': 98, '1101000001100010': 1, '0011100011001000': 49, '101001001111
1110': 9, '0100111110100101': 1, '0101111011111101': 12, '0110000110101000': 1, '101
0110101011101': 44, '0001101101001001': 7, '1000001101011000': 4, '001100000110001
1': 1, '1000111111001100': 1, '1010000000101010': 135, '1010000011111110': 162, '001
1000110011100': 1, '0101010110110111': 11, '1110100111001000': 94, '101011100111110
1': 8, '1100010110110101': 1, '0011010001000010': 3, '0011010000011100': 1, '1000101
001001000': 49, '0111001010000110': 1, '0110100111001100': 1, '0101101100001000': 1
1, '0111101100110111': 1, '0001011000010111': 32, '0011010111111100': 1, '1000111001
011100': 7, '0011000010110110': 109, '0101011001110101': 1, '0000101111001000': 12,
'0101101011101000': 3, '0010100001101001': 2, '1000111100101001': 28, '0001011111011
110': 4, '0101011111010111': 74, '0001000001100010': 12, '0011001110001110': 7, '000
1101010100110': 4, '1001101110011110': 4, '1100001000100010': 234, '010111101011001
1': 3, '0100111010010101': 10, '1010110000101001': 115, '0100011011010101': 1, '1011
101000011100': 3, '1010010101100011': 1, '1111000110010111': 1, '0011110000111101':
89, '0111100010000010': 2, '0101000101001010': 2, '0011000110001010': 68, '000100100
0011100': 14, '1100101110101000': 20, '0111001011011100': 1, '0001001110110110': 29,
'0111010010110111': 170, '1100100110011100': 2, '0101001001010010': 2, '110000001111
0110': 11, '0111101100100001': 2, '0011000110001000': 24, '0101010110000011': 44, '1
001111001101001': 18, '1010011101001001': 8, '1000110111001000': 1, '1001101110110110': 1, '1100011111010111': 239, '0101001110110111': 7, '1110010000000010': 3, '00101
10101101001': 7, '1100101011100010': 6, '0001101000010100': 3, '0000001111001110':
4, '0011110011011100': 2, '0101111000100001': 198, '1001011010100011': 35, '11100100
00101010': 6, '0110010000110111': 11, '1101011110000111': 6, '0001111111010101': 10
3, '1001001011110111': 2, '1010000001110010': 2, '0101011100010111': 104, '110010101
1110110': 16, '1111000011010110': 3, '1010100011111110': 14, '0101111011100101': 11,
'1100010011110111': 59, '1000111111111101': 10, '0010100010111101': 1, '001100100001
1000': 1, '1000011111010111': 9, '1000111101011001': 16, '1100101110010101': 13, '01
10110001110101': 8, '1010010001011100': 4, '0001010011111101': 1, '101001110010011
1': 1, '0001001110001010': 63, '0101011001100010': 10, '1101101110101000': 1, '11001
11111000011': 40, '1000011111011011': 1, '0111001111111110': 1, '1010111001101001':
35, '1110010011000011': 168, '1110011110110101': 1, '1110100101111101': 1, '10001111
00001001': 58, '1110010000010111': 36, '0011110111100101': 1, '1001001110111110': 6,
'0011101100011100': 137, '0100000100000010': 7, '0111110000110100': 1, '110011110001
0111': 17, '0001101001101100': 15, '1110100011011101': 1, '1100111010110101': 322,
'1100101010101000': 49, '0011010101000011': 20, '0110100000100010': 6, '101111011101
1101': 22, '1100111010010101': 95, '0101001011010111': 3, '0110100111001000': 11, '0
101101100001100': 1, '1101001110100010': 3, '1010000001001010': 2, '110010101110111
0': 1, '0001101000011100': 193, '1000101001011101': 2, '1110001111101110': 1, '01001
01011101000': 9, '1011010011011101': 6, '1110000101011100': 45, '1011001010011110':
4, '1110100110001000': 62, '1010000000100011': 1, '0101101100011101': 1, '0011000001
101010': 282, '0011101101101100': 1, '0101011101110111': 19, '0000000011101010': 1,
'1100101011010110': 3, '0100001011100011': 11, '0111100010100000': 1, '1111000011110

110': 3, '0011100010001100': 1, '0101101000110001': 2, '0111110100000011': 1, '10001 11100001000': 6, '0010100001001000': 8, '1100100100000010': 7, '1100011111000101': 2, '1010110100001001': 84, '1001001000110010': 2, '1110000111100011': 18, '010001010 0000111': 1, '1101111100110101': 2, '1100111000110011': 3, '0001000011100010': 1, '1 000111101001101': 3, '1011101100111100': 2, '0100101001100001': 2, '110000011001000 1 0': 77, '1000011100001010': 14, '0001000101100010': 9, '0110011111011110': 1, '00011 01000111100': 508, '1100100001111100': 1, '1101011100110111': 4, '1100001011010110': 104, '1010100101010100': 1, '1010110001000001': 7, '1011100000011000': 4, '101100011 0011110': 43, '1100110101110101': 2, '0011111111111101': 15, '0011100111011110': 4, '1001101101001000': 10, '1100001011101110': 19, '1111011110010011': 1, '101011000111 1101': 52, '1110010111101101': 1, '0111100110010110': 22, '0001000010101110': 2, '00 10101111001000': 2, '1011110000011100': 2, '1100011010010101': 5, '101001110000100 1': 2, '1000001001101010': 1, '1101001111010110': 11, '1110110110010101': 214, '1100 011000110111': 124, '1100111001100001': 356, '1111100010010110': 2, '011011000111110 0': 2, '1100101110011100': 34, '1100001011011010': 1, '0101010111110110': 1, '001100 1101001000': 1, '1010100101011100': 462, '1010110001110011': 1, '0010110101001000': 1, '0000100111001000': 3, '1100001011100010': 84, '0111010000100001': 15, '000111110 0000111': 2, '1001100111011101': 2, '1011100000001000': 5, '0001000010100010': 2, '1 110010111100011': 225, '0011000010101000': 10, '1011000110001010': 7, '1100001101111 010': 1, '0001101100101000': 73, '1110000111011110': 156, '0001010110010110': 2, '01 11100010100010': 4, '0110100100001100': 1, '0001011110100011': 116, '001110001000101 0': 2, '0111110100000001': 167, '1010100011101000': 114, '0001111100001001': 231, '0 011000010100110': 11, '1001111000010101': 3, '0011001101011010': 3, '101011011110110 1': 7, '1001101101001010': 1, '0110000111000010': 6, '0011010010011011': 1, '1001011 111011101': 3, '1110011101011100': 1, '0001111100111101': 34, '1110100101111100': 8 6, '1000101000001010': 7, '1100011111000011': 578, '0110111010110101': 1, '010110111 1110111': 1, '1110000101000010': 63, '0011010011010101': 4, '0011110111001101': 8, '1011010000110111': 5, '1000001101101001': 1, '1111010110000011': 23, '0011100001000 000': 1, '0101111100010111': 19, '1100000111100010': 4, '1101010000100011': 1, '0001 101100011100': 670, '1100011100000010': 13, '1001001111110110': 2, '010100000100001 1': 1, '1011101010101000': 1, '0111110011111101': 13, '1111110000000101': 1, '010100 1101100010': 42, '0100101101111100': 10, '0111001001101010': 1, '0011101111011100': 8, '0110000111111110': 1, '0011001110011010': 4, '0111010100010111': 107, '111010001 0101000': 48, '1110100100101000': 27, '1010100011001010': 2, '0001101010010110': 9, '0000101100101001': 1, '0101110011110101': 30, '1110010011100011': 596, '11001111010 01100': 1, '0110010011000111': 3, '0101000000110010': 3, '0000111011101101': 3, '001 1101000011100': 51, '1001011011101011': 1, '1100000001010010': 1, '111011100101010 1': 280, '0100111010111101': 17, '1100111011111101': 25, '1110010001100011': 16, '10 11100111001000': 10, '0001011101000010': 6, '1110000110011110': 11, '001110011111110 1': 299, '1110000000110010': 7, '0001011001100011': 23, '1110100001100001': 27, '100 1111101101001': 4, '0001100000101100': 4, '1100011101100010': 3, '1110111000001101': 1, '1110111100101001': 7, '0101001100000010': 31, '0011011011101011': 1, '1111110001 100001': 1, '0011100010101101': 3, '0001101110101000': 59, '1110010101010111': 216, '1010000001111010': 8, '1100101011111110': 3, '1100000111000110': 9, '11001011000010 00': 52, '0001011110000011': 291, '1110000000001000': 3, '0011000001011010': 9, '001 1101110011100': 1, '1110010000100010': 13, '0011111010111100': 1, '011000010100001 0': 7, '0111101000110100': 1, '0001101100001000': 237, '1010100110011101': 12, '1100 001101010100': 3, '0011000101001010': 313, '1100010010010111': 6, '100110101110100 0': 13, '1010110001100111': 1, '1001001010001000': 1, '1111110111110101': 4, '010011 1011100011': 5, '1100101010010110': 6, '1110010111010111': 168, '0100111000110101': 1, '0111100110100010': 2, '1110000001111100': 46, '1010000011101110': 20, '111100000 1101010': 5, '1000011101011001': 3, '0001100100011100': 42, '0001111100011101': 68, '1110110000110111': 21, '0111101110010110': 2, '0011100101010101': 1, '0001001110011 110': 333, '0001011010001101': 2, '0011010011100011': 6, '0111110000100001': 190, '0 111100100010010': 1, '1010100011111000': 5, '1011000100000010': 3, '011010001001100 0': 1, '0111010110110111': 50, '0001011110000110': 2, '1110110011000011': 10, '11100

10000100111': 33, '1010000100100010': 7, '1011100011011101': 1, '0001111111011100': 7, '0001100010001000': 1, '0010110010111101': 14, '1101010100110111': 1, '1100101011 110010': 1, '0101011100010011': 2, '1110101111111000': 1, '0011110000010101': 8, '11 10000111010110': 247, '0011000100100010': 2, '0001001101001000': 17, '10101111001010 00': 1, '1011000100001000': 2, '0100001101011100': 4, '1000001011101011': 1, '001110 1001101010': 4, '1101011001100011': 3, '1000011001111101': 5, '1100011011100011': 77 3, '1110111110010101': 15, '1100110101010001': 1, '0011000101001100': 5, '0001100000 011100': 22, '1110000100010010': 15, '0111010101000011': 35, '0100110001110001': 1, '1000101110111100': 19, '0001101110101110': 1, '1100001011110110': 239, '01111101000 10101': 29, '1100101100011100': 4, '0001001101101010': 75, '1000011011100011': 37, '0011010110011110': 25, '1100010111000011': 92, '0001011011110101': 15, '00111101011 00001': 4, '1010110101001001': 148, '0010100000001000': 4, '1101011000010111': 2, '1 000111101001000': 9, '1100011010110111': 120, '0111101111010101': 1, '10001001000011 00': 3, '0011100111010101': 7, '1000100010001000': 1, '0011111000001000': 2, '001111 0100000001': 130, '0111010110010111': 114, '0011000101011100': 1, '111011001101110 1': 5, '0111001101000010': 5, '0111010001100011': 33, '0000001001011100': 1, '101000 0101011000': 3, '0100111000010111': 1, '1110110001111101': 43, '1110100001111100': 2 86, '1111110010100011': 3, '0111001010000010': 2, '1000110010111101': 14, '001100110 1110010': 1, '0101010010000011': 20, '1100111110110101': 80, '0001100010101000': 8, '1000101100101000': 27, '1000111010011101': 37, '1010001011000010': 1, '010110000110 1100': 1, '0111011110010111': 5, '0100101001101001': 2, '0011000100011010': 6, '1011 110011110101': 16, '1110110100000101': 1, '1100111101001001': 95, '010110001101010 1': 2, '0101111100100001': 68, '0011111010111101': 19, '1010100110011100': 34, '1011 100110010110': 1, '1100001100111010': 1, '0001000010110011': 1, '0100001111011110': 11, '1011101010001110': 1, '0001110000111100': 4, '1100011010010110': 3, '1010001000 101010': 20, '1010111111101000': 1, '1100101001111100': 239, '0111110101000111': 3, '0011110110101000': 5, '1100001111001010': 31, '0111000110011110': 16, '000110100100 1000': 34, '0100101000000011': 1, '1100001000001010': 42, '1001001101000010': 13, '1 010010101010111': 10, '0011000111001100': 2, '1011010100111101': 1, '000111101000110 1': 6, '0011010001101010': 25, '1000101101011100': 366, '0101111010100111': 1, '1000 101001111100': 289, '1001001110011110': 36, '0110010101000001': 2, '101111000010000 1': 13, '1100101000100000': 1, '0001111110011101': 43, '0001100110011100': 1, '01110 00101000010': 142, '0001011111111101': 13, '0001111110000011': 38, '000111010000100 1': 17, '0011011011111101': 8, '1110100010101010': 1, '1100111110010101': 239, '1110 100100010100': 1, '1110110101010001': 26, '0111000011110110': 75, '000110111101000 0': 1, '0001101111100000': 4, '1101111010000011': 2, '1010110001111100': 26, '000100 1010111110': 250, '0111001100010111': 2, '1110010111110110': 7, '0100101000101010': 2, '0001111010100011': 50, '0011001110001010': 10, '1110010110000101': 1, '000110101 0100010': 7, '1001010010100011': 4, '0101011111010011': 14, '0001001011111101': 5, '0101111010110111': 21, '1110101010111100': 4, '1010100001001000': 65, '001110010000 1100': 41, '0110010110010111': 8, '1100100000101000': 2, '1001111111100101': 1, '000 1101110011110': 33, '0100100011011110': 1, '0001001011101010': 6, '000111110001000 1': 9, '0111010000110011': 2, '1010100111001000': 131, '1010011010111101': 4, '10110 00001001010': 16, '0011110100011001': 46, '1110000010110110': 91, '011101011000001 1': 329, '1100111001101001': 127, '1001101011001101': 1, '1110110110100111': 1, '000 1110111011101': 11, '0111101010110110': 1, '1100001111010110': 279, '111001010011011 1': 52, '1100101000001000': 17, '1110100001101001': 8, '1100001111101010': 10, '0111 110111010101': 118, '1110000000010010': 2, '0001011010000011': 92, '001101000010000 1': 13, '1000111010101101': 6, '1110000000001010': 57, '1011010011110111': 9, '00011 01001001010': 4, '0100100100000010': 2, '1111000010100110': 2, '1100001000001000': 2, '0001101000110100': 7, '1100011000100010': 14, '0001011101000111': 10, '111010101 1001000': 3, '1110000100001010': 121, '0011100100011000': 46, '1110000100000010': 26 1, '1101000110010110': 6, '1010100100011010': 1, '0101001110100011': 13, '0101101100 111101': 1, '0001011101010111': 52, '1100101010001000': 19, '0001101000001000': 84, '0111100000001100': 2, '1000100101001100': 2, '1010010111100011': 8, '10101100101111 01': 167, '1001011001101001': 2, '1101011001010111': 4, '1100011011110111': 279, '11

000011101001100': 3, '0101110110010111': 2, '0110000101011010': 1, '1010101011111110': 3, '0101011010010111': 42, '1100101011001000': 31, '1010111110011100': 1, '1100111101101000': 3, '0011100111111100': 20, '1110001111001000': 4, '1000101001111001': 3, '1110101001001100': 1, '1100001111000110': 47, '0011001010011110': 23, '1100001011000111': 1, '0001111010110101': 3, '1011100111111000': 2, '0001101111010100': 3, '0001100000111100': 39, '0101010100000011': 3, '1110110101010101': 41, '1110100000100010': 36, '1110110000000111': 4, '0111101110000000': 1, '1100101101011100': 256, '1011000000011010': 1, '0101110000110101': 9, '1010010111000011': 20, '0101001010110111': 11, '0001001001001010': 84, '1110011001001001': 3, '0011110111001000': 9, '0110000110111110': 3, '0001101001101000': 69, '0110010001100001': 7, '0011000001100010': 81, '1000111111001011': 1, '0101101100010111': 1, '1000001010111110': 8, '0001101101001000': 97, '0001011101100111': 3, '1001101010101000': 20, '1101011001101001': 1, '1100011111010011': 44, '1101101110000011': 1, '0001111000101001': 244, '1110011010010011': 1, '0001011111010110': 5, '1000101000101001': 6, '1110010011110111': 231, '0011000010111110': 264, '1100010101001001': 1, '0001001110010110': 139, '0001101110011100': 12, '1001011111110111': 2, '1110001001011100': 3, '0001111100010111': 6, '1010100001101101': 1, '0111010000110101': 3, '0100001101101010': 1, '1010100110111101': 7, '0100110010110101': 3, '1011000001000010': 5, '1010011010110111': 2, '0001011000001001': 5, '1100101110011000': 18, '1110101001101000': 14, '0010101000001100': 1, '0011100111011000': 17, '0011000010100010': 27, '1010110001111001': 27, '1100001011101000': 10, '1010001001101100': 2, '1100011110010101': 24, '1010000010111110': 9, '0001100100100000': 1, '0111100110001000': 17, '1010000011000010': 1, '1100010101010111': 44, '1100111011100011': 46, '1010111000101000': 2, '1110100100000010': 37, '0111010100100010': 1, '0011111100101001': 19, '0111100000111000': 2, '0100111110111101': 4, '0011100110001000': 266, '1010101001111100': 55, '1010101101001001': 2, '1110100011000010': 1, '0111100111011000': 1, '0101001100100010': 6, '0000111111011101': 5, '0011110000111100': 52, '1000001001001000': 7, '0101100100001000': 2, '0101111111110101': 61, '1110100100100010': 15, '1110110101000001': 244, '0111010100000010': 4, '1100111110000101': 10, '1011001110011110': 5, '0011101010111110': 8, '0101001000101000': 1, '0101011000110111': 132, '1010000000111010': 14, '1110110110001000': 5, '1100101001010000': 2, '1010110101111001': 7, '0011010110000011': 239, '0110010101010111': 25, '0011110010000011': 10, '1000000100100010': 1, '0011000111010101': 1, '1010000011101010': 40, '0111100000011100': 9, '0011010001010111': 14, '0001111000100001': 145, '0011110111011000': 2, '1110111001011101': 1, '0001101000011000': 7, '0011001000001010': 1, '1110000111111110': 39, '0001011100010101': 1, '1010011011001011': 1, '1110001011111110': 14, '1100101101001001': 5, '1010110110000101': 1, '0001001001101010': 236, '0101011011010111': 26, '0001111010010011': 3, '1001001010111110': 29, '1001011011110101': 1, '0101111010010111': 5, '0011000010101010': 61, '0001100100101100': 1, '0010110010010101': 1, '1010100111011110': 14, '0101000100010010': 1, '1010000010110110': 2, '1100011110110101': 6, '1011010000011101': 1, '1010110100011001': 1, '1110000000000010': 106, '1010100001111100': 351, '1100101100000010': 42, '1110110000101100': 1, '1100111100101000': 4, '1101011110110111': 5, '0011010010000011': 94, '0011100011011100': 27, '0010111000111101': 1, '0111111000010101': 1, '1011010110010110': 1, '1011100000100010': 1, '0100111001100001': 28, '1110111001011100': 1, '1100011011100110': 2, '1110110010100101': 11, '1000011001111010': 1, '1011111100111100': 1, '0011111011111101': 54, '0111010101010111': 52, '0100110001100001': 3, '1111001110010110': 3, '1100110101000001': 46, '0001101100111000': 9, '1001001110110110': 6, '0101101000111100': 30, '0000101101011100': 35, '0100001011101010': 1, '1000101010111100': 37, '0101101010100101': 1, '1110001011011110': 11, '1001101011111000': 2, '0000101101111100': 14, '0101101000011100': 12, '1011110110001101': 1, '0101111101000111': 1, '0111111010111101': 2, '1000111101111001': 11, '0101001111010010': 4, '1100101001110001': 4, '0101100100100000': 1, '0111000100010111': 9, '0001110000110001': 1, '1011010101101001': 1, '1110110110011101': 122, '0101010010000111': 2, '1000001001111100': 46, '0101100100111100': 1, '0001101110001000': 241, '1101001110000110': 5, '0011010001101011': 3, '1100011111100011': 246, '0100011001010011': 1, '1100001110011100': 1, '1010010101111001': 1, '0111110100100001': 44, '1000001101111100': 17, '0101

100000111100': 2, '1001111000100001': 17, '1000010100010111': 4, '0101011001010111': 22, '1100100001011100': 4, '1001111111011101': 24, '0001111100110101': 9, '100101111 1010101': 4, '0100101100101010': 1, '0011010010010011': 9, '0011000010001000': 6, '1 010110001001001': 51, '0101111000110111': 16, '1100000000001010': 5, '00111101010100 01': 1, '1110000011110110': 199, '0101001010010110': 70, '0011100100001000': 238, '0 011010100010111': 72, '1111000010000010': 1, '1100001110011110': 9, '111011100111100 1': 2, '0100101100001000': 7, '0011101111001000': 29, '0111010111110011': 11, '10101 11001011101': 4, '0011100110010110': 11, '0011000111111100': 2, '1110000001000010': 18, '0011111100011001': 6, '0111010010010011': 8, '0110001011100010': 1, '0100001000 000010': 10, '0111010010010110': 2, '1110110001110001': 28, '0011100110010011': 1, '0001111000111100': 32, '0100111100101010': 1, '1110100010010101': 6, '0001111101010 111': 3, '1001101000100001': 4, '0011111110100011': 2, '0110000101011100': 5, '11000 01101001010': 1, '0101111011010101': 52, '0001101000111000': 36, '0011111000100001': 6, '0011100100010100': 12, '1010110001101001': 157, '0001011100100001': 2, '11001010 10100000': 3, '0111010011010111': 25, '1001010111011101': 1, '1100101111001000': 95, '0101001001110010': 9, '1100000111010110': 47, '1110010111011110': 12, '000101100101 0111': 16, '1010001100001010': 27, '0011000000011100': 12, '0011000000011000': 3, '1 011101011111100': 2, '1000110101011001': 3, '1001110000101000': 1, '010001111111001 1': 1, '1100010100000010': 3, '1110000011100010': 66, '0001011011010011': 3, '100110 1111101000': 4, '0011000101011010': 27, '0011010010010111': 39, '1110111010011101': 2, '0001111010101000': 20, '0011001101001100': 2, '1010100101011000': 27, '101000100 1111010': 2, '1110101111101000': 9, '1010011100110111': 1, '0001100010100110': 1, '0 110110001101001': 10, '0100010001011100': 1, '0011000111010110': 80, '10100000111010 11': 1, '0101001110000010': 54, '1000001110011110': 10, '0001101100001101': 1, '1011 000001101010': 28, '1010100110011000': 27, '0101011010100011': 404, '100001011110001 1': 2, '0001100111001000': 9, '1010110011101101': 11, '0001111010000101': 1, '111011 0001100001': 289, '0111100000110111': 1, '0001000111011110': 4, '0011100010111100': 12, '1110010001001010': 1, '1100111011100111': 5, '1110101101111101': 1, '0101111111 010101': 141, '0010110110111101': 5, '1101011011010110': 1, '0011100000101100': 36, '0011010101010111': 39, '1000111011110111': 1, '0100011010010101': 3, '0011010010110 111': 131, '1100001111000011': 42, '1110110100101001': 26, '0001001010100010': 35, '0000011100011111': 1, '0101111100000101': 3, '0110000101101001': 1, '10001110110111 10': 1, '0001111011111101': 282, '0011100100111100': 189, '0001000111110110': 3, '01 00111010011101': 3, '0111000110000010': 39, '1100100010101000': 2, '101110100001001 0': 1, '0011110000110101': 25, '1000001111001000': 18, '1100001110110110': 26, '1110 111111010111': 3, '1110010110010111': 74, '0111110100101001': 3, '1000011111110111': 3, '1100101101001000': 121, '0001111111011000': 2, '0101101111010000': 1, '100010101 0001000': 24, '0111100100000001': 12, '0110101101001001': 1, '1001110111111101': 1, '0111110100011100': 5, '1000001011101000': 8, '1000101011001110': 1, '01011101000100 01': 4, '0110100101111100': 10, '0010111100001001': 4, '0010100111111101': 1, '01110 00101010010': 7, '1010110101010101': 2, '1100011011000011': 223, '0111100000111100': 41, '1101001000010010': 1, '0111000101000111': 2, '1000101011101010': 1, '1000001010 010110': 5, '0100101010111000': 2, '1100100101100001': 1, '0011000110111110': 106, '1011100100001000': 25, '1110110101001001': 116, '0001011001011111': 1, '01110001011 11010': 1, '0101011000100111': 4, '1100101111101000': 29, '1100101001011100': 93, '0 001111110000101': 7, '0011110110011101': 61, '0011100000011000': 17, '11100000001000 11': 6, '0100010011000111': 1, '1110110001010001': 5, '0011010111010110': 3, '001000 0100001010': 20, '1100001001100111': 1, '0110100110111100': 2, '1100010000010010': 1, '1011111010101000': 1, '0101101110010110': 26, '1011010111010111': 3, '0110100011 101000': 7, '1011000101000010': 12, '0001101001001100': 8, '0011010010100011': 275, '0111010101100111': 8, '0111110001100001': 12, '1001011010111111': 1, '0001011100010 010': 1, '1000101101101001': 4, '0001001100111000': 2, '0110110011100011': 4, '11001 11101111100': 5, '1010100000101000': 78, '0011101000101100': 6, '0101011110110111': 47, '0011010110001101': 4, '1100010101000010': 1, '1001100100011100': 3, '1111010101 001010': 1, '0011110000011100': 13, '0101111111010111': 5, '1011001110111110': 1, '1 000111000101001': 93, '1100001111101110': 4, '0001001100011100': 52, '11001011001010

10': 5, '1100100101001000': 5, '1100000101011100': 1, '0101011111000101': 2, '100101 0011110101': 1, '1110010100110011': 2, '1010100000001100': 5, '1000111001000001': 6, '1000011010101010': 1, '0001010000101001': 1, '0011010000111101': 9, '11000010011100 10': 29, '1100001111010010': 6, '0001001100000000': 1, '0011010111011101': 18, '1000 111001111101': 52, '0110111001100001': 4, '0111111010010111': 1, '1110110001011100': 8, '0011010000000001': 4, '0001011010011011': 1, '1110000000101010': 118, '000111001 1110101': 14, '0111000111010111': 5, '1011100000111000': 3, '1101011110100011': 14, '0011111100011100': 9, '1010000101010010': 2, '1100101010110101': 19, '0001011100011 101': 2, '0011110001001010': 1, '0001011000011001': 2, '1001001001011010': 1, '01011 11010100011': 65, '0011011010011111': 1, '0110111110010101': 1, '0001011011101000': 1, '0011000100101000': 5, '0001001101000010': 126, '1001110100001001': 1, '110000010 0000010': 60, '1100010111110111': 15, '1100111111100101': 4, '0001000110000011': 3, '1110000000110111': 11, '1100100101000001': 1, '1110110001001001': 38, '111000101100 1010': 1, '1010111100001101': 1, '0011100000011100': 251, '1000001011001010': 19, '0 011100010101000': 245, '1100001111011110': 149, '0000101101101001': 1, '111001010100 0001': 27, '0011010111010011': 12, '0001000000100010': 4, '1100001001100010': 56, '0 011110110010111': 15, '1000101110001100': 3, '1110110001000001': 87, '01110111100001 11': 1, '1110100010010110': 1, '1110110010010101': 75, '1001111100001001': 18, '0011 000100011100': 51, '1001111111001101': 2, '1100000000100111': 2, '1100001100101000': 1, '1110111101001001': 16, '1111110000000001': 7, '1000001100101010': 46, '001100111 0011110': 53, '0111010100010011': 3, '0011110110000101': 2, '1110101000101000': 14, '0001100000100001': 2, '0101011011110111': 105, '0011100010100110': 1, '001111111001 1101': 14, '1111010011010111': 2, '1110100101010100': 16, '1100011111111110': 4, '11 00111101010101': 54, '1100111011110111': 20, '0110000011000110': 1, '000101110100101 0': 11, '1000100010111100': 1, '1110000100000111': 4, '0001111011101101': 17, '11111 10100010111': 4, '0011000011011100': 6, '1001111100101001': 12, '1110111101101001': 8, '0001101010001000': 80, '0110010101100011': 2, '0011110010001101': 9, '1100110110 110101': 14, '0011010111000111': 1, '1001101011011101': 1, '1000100111101000': 2, '1 010000011111100': 2, '1001001110000010': 4, '0011000110011110': 356, '10111101000010 01': 17, '1010010011100111': 2, '0111000001000010': 44, '1101111110000101': 1, '0011 101110001010': 1, '1000111001101001': 164, '0001001101101000': 4, '011000001110001 1': 2, '1110010000101100': 1, '1010010111011101': 4, '1010100001111000': 27, '000101 1110001011': 12, '0110010100010111': 10, '0011110011001000': 4, '0100011101011100': 1, '1011110001110111': 1, '1100100001100000': 1, '0110100111001010': 1, '01111000010 00010': 3, '0001100011101100': 1, '0001010010100011': 49, '1011000011111110': 3, '11 00001001000010': 23, '0001001011001110': 1, '0011001011101010': 4, '010101111111011 1': 33, '0001000000000010': 1, '1100001110010110': 128, '1110111001001001': 9, '0011 010100011101': 7, '1000111010111101': 137, '1110000111101110': 5, '001111000010110 1': 7, '1100001110101010': 4, '1100110001101000': 1, '0111001111010110': 6, '0010010 000110111': 1, '1110010110010101': 15, '0001101000101000': 181, '0011110000110111': 10, '0101000101000010': 35, '1001101110010110': 2, '0001101010101110': 4, '111001011 0001011': 2, '0011001110000110': 2, '0001000001101010': 16, '0101011111011101': 1, '1101110000100001': 5, '0011100001001001': 2, '1100001000101010': 101, '110011110100 0001': 301, '1010010000001010': 7, '0101110010100011': 13, '1010110101101000': 4, '0 011010110010110': 2, '1000001010101000': 3, '1000101101001100': 33, '110011100011010 1': 3, '0111000010010110': 45, '1010000111101010': 9, '0100111111000011': 4, '111001 0110011110': 1, '1000011111111110': 3, '0101011010110111': 164, '1000010111110111': 1, '1010111101001001': 29, '1110101010111101': 2, '0110100101011000': 6, '0011100100 001101': 1, '0101001101000010': 172, '1100111001111100': 21, '1010010101001000': 1, '1111110000100001': 17, '0001001010000011': 6, '1000001100001010': 145, '11011011001 10101': 1, '0010001011101110': 1, '0001101011101100': 2, '0100111010110101': 27, '01 10000001100010': 5, '1110110010111101': 149, '0111010110010110': 8, '111001101110001 1': 42, '0011111000001001': 20, '1100100000100010': 4, '0000111111001000': 2, '10000 01100000010': 12, '1011101001101000': 1, '0101001101001010': 10, '0001011010111011': 2, '1111010111000011': 2, '0111010011110110': 3, '1100110111100011': 5, '00010011111 10111': 3, '0110000111010010': 2, '1110010111000010': 5, '0101000011101101': 1, '010

1010001110111': 16, '0011100100011100': 707, '1011100110000010': 1, '001101001101110
1': 12, '0011110111000101': 6, '1011001010001010': 1, '0110111010111101': 3, '111000
0101001100': 4, '1011100011111110': 2, '0100001011000110': 2, '1100011001110111': 26
7, '0101001010110110': 148, '0011010100110111': 40, '0110110100010111': 1, '00110100
10111110': 26, '1110110101111101': 16, '1110100101111010': 1, '1110100100101100': 1,
'1100111110001101': 4, '0001011010101110': 1, '0111000010101010': 1, '11100100100101
11': 32, '0101111111111101': 2, '0001111010110011': 6, '1101011011110011': 6, '01100
11111000011': 3, '1110100010110110': 13, '1100011001010011': 2, '1010000110001110':
2, '1010100010011000': 5, '0001001110100011': 7, '0001001110001000': 9, '10110010111
01110': 1, '1110111110011101': 21, '0011000101000010': 106, '0011101100101100': 4,
'1110001110011110': 1, '0101110001100001': 2, '1100011011100111': 48, '0001011101101
001': 6, '1000011000111010': 5, '1100101011101000': 68, '1110000011001010': 11, '111
0100010001000': 20, '1110000000100010': 226, '1010100000011100': 3, '010101101010011
1': 22, '1000100101011100': 25, '1110001000100010': 19, '1000101001101100': 18, '110
0111101011101': 27, '1010110000001000': 1, '0001111011100101': 14, '111001000110000
1': 45, '0111110010110111': 24, '0011110000001001': 84, '0011110010101000': 19, '010
0110111110111': 1, '1010101101011100': 66, '0000111101011001': 2, '100110010000100
0': 4, '1100011100010111': 103, '0011100101000010': 10, '0101001101110111': 1, '1110
010101010011': 2, '0100101010101000': 4, '1110100111101000': 25, '0100001000101010':
13, '1100001111000010': 88, '0111000110010110': 144, '1010101010101000': 9, '1010000
001111100': 59, '1011010000101001': 3, '1110001011100011': 2, '1011100011011100': 1,
'0001111111011101': 216, '0101011101100011': 15, '0100001111101110': 1, '01010011000
10010': 11, '0010010111000011': 2, '1100010011110110': 5, '1001101100011100': 67, '1
010110110111101': 53, '1000101110001000': 61, '0101011001010101': 2, '00111110011010
01': 22, '1100010011000011': 26, '1000001101111010': 3, '0001010011011101': 1, '1010
000011001110': 7, '0011110000000001': 37, '1010100011111011': 1, '0101000110010110':
27, '0000101001101100': 1, '1110011100000010': 3, '1010100011011110': 2, '0111000001
101010': 13, '1100011101010011': 9, '0100011011100011': 66, '0001010101010111': 5,
'0011100001001000': 41, '0011110101001101': 2, '0011100001101010': 20, '110001100010
0011': 58, '1101011010100011': 51, '0010101011001101': 1, '0001101000110101': 4, '01
01110101000001': 1, '0101001010000011': 2, '0011110111110101': 45, '110011000111010
1': 12, '1110100101011100': 308, '0101101011110110': 6, '1010010100001000': 2, '0111
100100111100': 11, '1100101000000010': 16, '0111010010000011': 97, '001100111111011
0': 1, '1111000000100010': 2, '0011110000111000': 4, '1110100000011100': 2, '1111010
010110111': 22, '1110110100110101': 1, '1010000111001010': 39, '1000100001111100': 2
2, '1100001010010110': 35, '1000111000100001': 3, '1110010100010111': 109, '11011011
00010001': 1, '0111010001100111': 15, '1010110101001100': 1, '1010011010001110': 1,
'0011110001101000': 3, '0001101001100010': 10, '1100111100011111': 1, '1100111010111
101': 108, '0001100110110110': 2, '0001011100110111': 30, '0100011100000010': 4, '01
01001110010110': 162, '1100010110110011': 2, '1110100001001100': 12, '10000001110111
10': 10, '0111110111001101': 2, '0101111000010001': 8, '0001111000010101': 10, '0111
110100001001': 13, '0010110001111101': 4, '0001001000101100': 4, '1010000001011000':
3, '1010010001010111': 6, '1011100011111100': 8, '1010000001011100': 23, '0001001000
101000': 11, '1110000111101000': 7, '0011110000101001': 282, '0111110100110101': 13,
'0001101010101000': 229, '1110010101110111': 80, '0001111011011100': 2, '10101001000
01100': 12, '1010110000111101': 2, '0010010101011010': 1, '1110100110110101': 9, '01
01111101100010': 1, '0111011000110111': 7, '0001101111011101': 14, '111001100001011
1': 1, '1000001111101110': 5, '0011100111001000': 149, '0100011111000011': 69, '1010
110101000001': 13, '0011110101101001': 36, '0110000110010110': 9, '000101010110001
0': 1, '0101011100110111': 36, '1011000000001100': 1, '0011100111001101': 1, '111011
0101011001': 22, '0001101111011000': 27, '1000001111011110': 182, '0001111100101000
1': 77, '0111000010101101': 1, '0111001100100010': 1, '0111010001000011': 6, '000111
1100100001': 65, '1100111101100000': 2, '1110100101000011': 1, '0100110010010101':
3, '0111010101100011': 15, '1010010001111100': 3, '1111000010111110': 2, '0011010010
100111': 12, '0011100000111100': 619, '1110100101001000': 144, '0010000000111010':
1, '0101000101010111': 1, '1101111011010101': 6, '0011000110010111': 2, '10001011001

11100': 5, '1001001010010110': 5, '1010001001001001': 1, '1100111001110101': 73, '00
01001010001110': 11, '0011001001101010': 41, '0001001011001000': 5, '010000000010001
0': 5, '0111010011110011': 19, '1110010011010011': 7, '1100001001101001': 1, '010111
0100100001': 6, '1000101101111100': 95, '1000111001111000': 1, '0101101000000010':
1, '1100110010010101': 16, '1110100111101010': 2, '0101100110000010': 2, '0101001111
110110': 32, '1011000010000011': 1, '1110000111011100': 1, '0110010111000011': 59,
'1010100001011100': 131, '1110100100001001': 5, '0111111011110101': 16, '11001110111
01000': 4, '0011101100001000': 47, '1110110001100101': 9, '0100101111001000': 14, '0
001001101001100': 2, '0011100110000011': 2, '1110000001010111': 7, '101011100111100
1': 2, '1110010010110111': 89, '1110011111000111': 3, '1000011100011111': 2, '101100
0111001000': 5, '1010000111001110': 23, '0011100001101000': 111, '1100011000010111':
44, '0001101001001001': 2, '1101011010110111': 21, '0111110001000001': 4, '110000010
0110010': 1, '1000011001001001': 2, '1000101111001000': 122, '0111000010100010': 35,
'1001100111111000': 1, '1110110101000011': 2, '1110010010011101': 3, '01011111111101
11': 2, '1100001011001011': 1, '1110010111000011': 487, '0011110100010101': 29, '111
0010011001010': 1, '1110110011101000': 3, '0010100010111100': 7, '0001101011010101':
2, '1010000111011110': 215, '0110100101000000': 1, '1110100111000100': 1, '001000000
0001010': 6, '1000101011101000': 93, '0011001001001010': 18, '0111101111111100': 1,
'1100101101000100': 2, '0000101001011100': 8, '1010110110001000': 3, '01011010110010
00': 2, '1100000101110010': 2, '0000101111101000': 2, '0001011111010111': 63, '11111
10101000001': 2, '1110010011110110': 23, '1000101000101000': 52, '0011000111111110':
9, '1011100000111101': 1, '1001011000110111': 3, '0011100100101100': 13, '0001111010
000011': 18, '0101001100110111': 3, '0001101101001100': 14, '0100011011100111': 8,
'1100011101010111': 184, '1100111000100111': 4, '0111100000110101': 1, '010000100111
0010': 3, '1110110001100011': 2, '1011101000111100': 9, '1010000000001010': 70, '000
1011110111101': 2, '0111100011100000': 4, '1111110011110101': 9, '1100001001111000':
5, '1110010011100110': 2, '0011100101101000': 30, '0011111100001001': 39, '011101001
0000111': 6, '1110110100001011': 1, '1010101100001000': 18, '0110100010100011': 333,
'1000101110011100': 32, '0100111001011100': 1, '1110101101000000': 2, '1010100001101
000': 153, '0001111010110111': 10, '1110010010010011': 6, '0110010010010110': 1, '11
01011011110111': 10, '1010000110001010': 5, '1100011001010111': 63, '100111110000100
0': 3, '1100011100000111': 30, '1100011010110110': 9, '1000011111100011': 15, '10001
11101001001': 123, '0011110001101100': 1, '1001111001100011': 1, '1010110101001000':
11, '0100011011110111': 32, '1111010001110111': 13, '0000001100001010': 19, '1100111
001010111': 7, '1110110101101001': 44, '0011110100001001': 238, '0001001101111010':
5, '1000101111011110': 15, '0010110001101000': 2, '1110110001101001': 134, '00000010
11011110': 8, '0011110100110101': 6, '0011000010100011': 21, '1100110010110101': 39,
'0001101011110101': 19, '1101011001000111': 1, '1110101001101001': 4, '1000001000101
010': 140, '0111000001100011': 1, '0111100001010010': 1, '1100100001110100': 3, '100
1011010000011': 19, '1000001101111000': 3, '1100100001011000': 1, '011110011000011
0': 2, '1100001011011110': 50, '1110111101011001': 3, '0011111111011101': 46, '11001
10100010101': 1, '0011100110111110': 11, '1101111111001000': 1, '1100001011001110':
8, '0010111101100001': 1, '1010110001011101': 19, '1100111110000000': 1, '0111010100
000111': 2, '1111011000110111': 1, '0011010010101101': 3, '1111000010110110': 16, '0
011100111111000': 8, '1110101001001000': 10, '0111101000101000': 3, '0001101000111010
0': 1, '1100001101001000': 16, '0011100001100101': 1, '0010110010101101': 2, '011110
0010111110': 4, '1111011111010111': 1, '0011101000111100': 99, '0101101100100001':
6, '1110100101010010': 2, '0001101000111101': 6, '0011110111111101': 100, '110011000
1111101': 2, '0111000111010011': 1, '0001111000111000': 4, '1011110111010101': 11,
'1101011110100111': 2, '0001011111010101': 14, '0111100000100010': 2, '0111010010010
111': 36, '1110100001110111': 2, '1100101000110100': 1, '1101000110110110': 1, '1000
111010000101': 2, '0001111101001010': 3, '1010100010010000': 1, '0011001110101110':
5, '0011010000100011': 5, '0011100000001001': 5, '1100011110111101': 2, '10110011010
01010': 6, '0011101110011000': 2, '1100000100100010': 13, '0101101111010101': 9, '00
01001101100010': 38, '1000000001011100': 2, '0101000110000010': 11, '011111000001100
1': 2, '0111100100000100': 1, '1011100110011000': 2, '1011110010101111': 1, '0010000

011101010': 2, '1110100011101000': 81, '0100111101000001': 26, '0100010111000011': 1
1, '1110011011000011': 10, '0111011010100011': 24, '0011000011010110': 16, '11001011
10001000': 39, '1001101100111100': 17, '0001110011100101': 5, '1011110010101101': 2,
'0111100011010110': 2, '1011100010111100': 2, '0101011100000011': 6, '00010100000101
11': 7, '1110100101100010': 3, '0111010101000010': 10, '1110110100000001': 27, '1111
010011100011': 1, '1010000010011100': 2, '0111010001110111': 76, '1001111000111101':
2, '1001001110101000': 1, '1001111100010001': 3, '0101011110000011': 328, '110000101
1100011': 44, '0010110101001001': 21, '0101100000110101': 2, '1111010001100111': 1,
'1110000010010110': 34, '0111000100000010': 26, '0001101101101001': 1, '000111000010
0000': 1, '0100001111100010': 5, '1001001110100110': 1, '1110100010111101': 6, '0110
000100000010': 21, '0010100010101000': 6, '0100101001111001': 1, '1000111111101000':
3, '0000011101011100': 1, '1000011110001011': 1, '0111000010100011': 27, '0001011010
100111': 28, '0001101111001000': 125, '1101001110111110': 3, '1101001110000010': 4,
'0011010001101111': 2, '1000000111110110': 1, '0101010000110111': 24, '1000011011111
110': 15, '1110110000000001': 11, '1000101101011101': 2, '0011011010011110': 1, '010
1111010100000': 1, '0000011111100011': 1, '1110010101110010': 2, '0010110001001001':
4, '1100100110000000': 2, '1010000011101000': 15, '1000011101011101': 10, '011100010
1100010': 46, '1010110010001101': 5, '0100001111000010': 8, '1001111011111101': 21,
'1110010111000110': 3, '1000100011001000': 1, '0001111011110101': 138, '010111110011
0001': 8, '1011011010011011': 1, '1100001101000111': 1, '0001001001011010': 3, '0101
100110100010': 1, '1000001011100010': 2, '1110100001001000': 46, '1000011110110111':
3, '1001101101001100': 3, '1100001001111100': 42, '0011010000110101': 2, '1100000101
010010': 4, '1101010010110011': 2, '1110000110011000': 3, '1110101011011100': 1, '01
01001011110110': 83, '0100000011100010': 3, '0011100101101100': 5, '010000101100001
0': 1, '111010001101 0110': 6, '1100011001110011': 5, '1110001111011110': 23, '000110
1001100001': 4, '1101011011010011': 1, '0110110011000101': 1, '0011110010101101': 2
4, '0001110010111101': 3, '1101001110011110': 2, '1110000110101000': 2, '00010011100
10010': 5, '0010000011111110': 26, '1000001011101110': 15, '1000101011001000': 44,
'0000101011011100': 1, '0101111101001001': 4, '1100000010010110': 5, '11100010111000
10': 5, '1101000011110110': 1, '0101101110000011': 3, '0011000100110111': 3, '110101
1101000001': 1, '0100011111110111': 15, '1110000011100110': 35, '0001011011010111':
20, '1100101000101000': 51, '0100101010110101': 3, '1010110110111100': 1, '100110110
0011101': 2, '0101011010000011': 114, '0100011011111111': 1, '1010100110001000': 58,
'0011000101110111': 2, '0001100111110110': 3, '0110000100001010': 14, '1010010011001
000': 2, '1110010110110111': 33, '0011010101101001': 3, '1111000010010110': 2, '0111
010000010101': 1, '0110110101001001': 15, '0001010001000010': 3, '1000111110110101':
6, '0110110010001101': 1, '1100000011110110': 43, '0011100011101000': 106, '00011110
11011101': 68, '0101010110100011': 17, '1110100000001010': 12, '0001011110010111': 1
07, '0011101001001000': 7, '0001101100111101': 1, '0101111000010101': 9, '0001111000
010001': 5, '0111000111110110': 20, '0011100000110100': 5, '0101111101000001': 11,
'1100010111100011': 30, '1100101100000011': 3, '1100111100101001': 18, '011110010001
0111': 5, '0011000000000010': 6, '1101001110100011': 2, '0011110011010101': 31, '011
1100001110010': 1, '1100101001101000': 99, '0011000110000110': 16, '111010011001010
1': 12, '1011100111011100': 10, '1011010101100111': 1, '0011000111010010': 2, '01010
01110000110': 32, '0100011100010010': 1, '0101011111100011': 5, '1110000111101010':
5, '1011100100001100': 7, '0011010110001000': 1, '1000101111101010': 5, '11001000011
11100': 13, '1000111111001000': 12, '1000001101011100': 55, '1110011100000111': 2,
'0101100000011100': 1, '0111011101100111': 1, '0000110001101001': 1, '11000111110010
10': 4, '1011010010100011': 34, '0101111011101101': 1, '1100000010110110': 18, '0101
011010001101': 1, '1000100110011100': 2, '0011110100011100': 46, '0001101011011100':
15, '0101000011010110': 7, '1000011111011111': 6, '1110010011000111': 8, '0101000000
100010': 4, '1010010101001001': 17, '0001001010000010': 9, '0011111011101101': 4, '0
100011010110011': 4, '1100000001000010': 6, '1100011100100011': 20, '100010100010101
0': 13, '0001011101110011': 1, '0101111000110101': 37, '0001111000111001': 43, '0100
001100010010': 2, '0111000111010010': 2, '0011100000101000': 252, '101001011100110
1': 1, '0000111101001001': 10, '1100011100000011': 51, '1100000000100010': 56, '1110

110110111101': 46, '0101000001000010': 9, '1110010100000011': 53, '111111010010000
1': 7, '1000101000001000': 28, '0001011110011111': 3, '0001110010010111': 1, '001111
0101001001': 81, '0010100110111100': 3, '0101001001101010': 11, '0001010011110011':
1, '0001001110000110': 18, '1110000011100011': 41, '0101010101100111': 2, '110001110
1100001': 10, '0111100000101000': 10, '0101000001100010': 25, '1100000000000010': 1
5, '0101111000111101': 5, '0111000111011100': 1, '0011100110011000': 4, '11100000011
01000': 16, '1000101111101101': 1, '1110111101010101': 2, '0110000100001000': 1, '10
11110100101100': 1, '1010010011001010': 3, '0101011110000111': 28, '100111110001010
1': 6, '1110100001010100': 7, '1110110001010111': 3, '1101111010110011': 2, '0100000
111011110': 1, '1110001000001010': 5, '0001011010010110': 2, '0111111000000001': 2,
'0001101010011000': 5, '0001011111110111': 27, '1000010000001001': 1, '01100101010 10
001': 1, '1011110000110001': 3, '1001111010101101': 3, '1100101100101000': 25, '0011
000100010111': 4, '1010000110011110': 9, '1100011100001011': 1, '0100011111010111':
22, '1010100010101000': 61, '1110110110110101': 95, '1111010000110011': 1, '00010000
10110111': 3, '1010101001011100': 33, '1100101010010101': 6, '1110010111010110': 24,
'0001001100101001': 3, '0001011100000111': 3, '1000110100101001': 1, '11100001111101
11': 6, '0100011111100011': 26, '0010100101001000': 19, '1110110111000101': 7, '1000
000100011010': 1, '0100011010110101': 4, '1110110011100011': 51, '1010111010011101':
7, '1001111110001000': 4, '0001001011110110': 70, '1110001001100010': 5, '1100011010
010111': 30, '0011100101001100': 27, '1100011100011111': 1, '0100011010101111': 1,
'0101111001100111': 3, '1110101011111100': 1, '0001001010011110': 101, '101001011011
0111': 5, '1001001010000010': 4, '1100001001011100': 10, '1000001111000110': 5, '011
1100101000000': 2, '0111110001010101': 3, '1001001101100010': 1, '1000111011001101':
3, '0011010100001101': 2, '0011010011110111': 74, '0111010110100011': 121, '11101001
11000011': 3, '0001110000110101': 6, '0001011000111000': 1, '1100101001110101': 6,
'0111101100011000': 1, '0111100100011101': 2, '1110110000100001': 38, '1000001111010
110': 21, '0100110000110111': 1, '0111010100000101': 2, '0010011111001010': 1, '0001
011010100011': 337, '0011110100001000': 14, '0011111000000001': 1, '010111101111010
1': 197, '1000011111000111': 2, '0001101011101000': 136, '0011111001101000': 1, '001
1110100100001': 49, '1100011110010111': 101, '0000101001111101': 1, '001011001001110
1': 5, '1110000111001110': 19, '0111010000101001': 2, '1100010000010111': 9, '001010
0101101000': 2, '0101101110010011': 1, '0110101111001000': 3, '1000110101001001': 9,
'1010110101101101': 1, '1110000011101010': 22, '1001111010000011': 2, '1110010101000
011': 14, '1010001111111100': 1, '1000111001110001': 1, '1100101111011100': 8, '1111
001010110110': 1, '0001001111001110': 6, '1000101111111101': 2, '1011100110001000':
26, '1001011100011101': 2, '0001111111111101': 94, '1011001110010110': 1, '100001101
1101110': 2, '0011101010110110': 1, '1110001101011100': 8, '0101011110110011': 8, '0
111001011110110': 8, '1100111101010001': 24, '0110000011000010': 3, '110011110111100 1
1': 3, '0111110000000001': 51, '1100100101001100': 1, '1110001011000011': 1, '110101
1110010011': 5, '0100010000100011': 7, '0001000110010110': 27, '1010100000001000': 3
8, '1100010011101010': 1, '0011100100011101': 7, '1000101001101000': 124, '111001110
1110111': 4, '0111011100010111': 9, '0001111001110101': 5, '0100111001001001': 4, '0
011000010010110': 43, '1010110001110101': 3, '0111010000100111': 2, '100000111111111
0': 44, '0001111100000001': 126, '1110111101000001': 11, '0010101011101000': 2, '100
0010001010111': 1, '1001111100000001': 14, '0101011110010111': 146, '100000110110100
0': 9, '0101110010110111': 3, '0011010011110101': 24, '0111100101000010': 14, '01111
10001010111': 2, '0011110000111001': 52, '1010111010111101': 38, '1101111100000001':
11, '1101111010110111': 2, '1000111001101000': 8, '0010110000101000': 1, '1110110000
101001': 73, '0110101101011101': 1, '0100010011000011': 4, '0100001000100010': 23,
'1110110001010101': 24, '1110100001111000': 16, '0101000001100111': 1, '110010101011
1101': 6, '1010000101011100': 60, '0111111100011101': 1, '0001001001101100': 3, '010
1101111001000': 5, '1100111010010011': 1, '1011000000111100': 1, '0001011100010111':
89, '0001100111010110': 1, '1001011011110111': 8, '0101011011010101': 10, '000111100
0011101': 16, '0011100010001000': 89, '0001101100110001': 1, '1011000001110010': 1,
'1100110101001000': 1, '0111110111000101': 7, '1110000100101001': 1, '01101101101101
01': 10, '1110010100000111': 30, '0100101001111100': 22, '0111110011100101': 15, '10

00011001110111': 12, '1100010100010111': 20, '1110010011010110': 6, '101000000000001
0': 3, '0111100011010100': 1, '0101011100000001': 9, '0001011110110111': 45, '110000
1100001010': 109, '0001000101001010': 16, '1110110101011100': 28, '110011111001110
1': 107, '0001001100001000': 13, '0011011101011010': 1, '0111100100100010': 1, '1001
101111111100': 2, '1011000100110010': 1, '0011010000001001': 7, '1100100101011100':
23, '1101110010000111': 1, '0110111001101001': 1, '0001010100000001': 1, '0011101010
001100': 2, '0100111001010101': 1, '0111111000100001': 13, '0101011001100011': 41,
'0101110111010101': 21, '0001011100010011': 2, '1000101101101000': 45, '001000011101
1110': 29, '0001101000100001': 10, '1100110001100001': 42, '1100101111000011': 4, '1
010001011001010': 2, '1001001011011000': 1, '0011110011101000': 9, '001111011000110
1': 14, '0101011101000011': 26, '1010000101001001': 3, '0101100100100001': 2, '11000
11010011110': 1, '0100001111010110': 25, '0001001110101010': 14, '1100101110111100':
7, '0001111111101101': 1, '1110001101101000': 1, '0000111110010101': 3, '11001111110
01000': 7, '1000101010011101': 2, '1110010001110111': 258, '1011010010111110': 3, '0
101111111011101': 8, '1110100110101000': 17, '0110100010111000': 5, '110000110000001
0': 271, '1011110001001001': 2, '0001000101000010': 24, '1010100101111100': 114, '10
10000111010111': 1, '0011101101011010': 1, '0111110100110001': 8, '001101010000000
1': 9, '1010010101101001': 8, '0011100100111000': 5, '1110000101101010': 1, '1011001
101100010': 2, '1110101010101000': 6, '0111010011100011': 4, '0011100011010100': 1,
'0011010010001101': 1, '1011100010101000': 28, '1100101111010110': 18, '011011010110
0001': 9, '1110010111010011': 31, '0011010101000001': 1, '1110000011100111': 2, '010
1010101100011': 3, '0001011011010110': 3, '1100101000101001': 6, '1011011110000010':
1, '1110000101001000': 9, '0001111111110101': 48, '0001001111010110': 66, '101101010
1001010': 1, '0001011110011110': 25, '1100101101010000': 2, '0001001100100010': 6,
'1001001110010110': 19, '0011111000011000': 1, '0011110100110111': 3, '1100110010110
111': 4, '1010010011100011': 31, '1001010110111110': 1, '0011110001101001': 106, '01
01100010110110': 7, '1110000111001000': 19, '1000001111110110': 2, '110011100101100
0': 1, '0011000010011110': 108, '0000101001111001': 1, '0111001010110010': 2, '11101
10111001000': 3, '1110010000001010': 4, '0010100001011100': 16, '1000011001111001':
4, '0100101000100010': 3, '0111101000000001': 1, '0001001010110110': 120, '100001111
0011110': 1, '0011001010111010': 4, '0111111111110101': 4, '1011110100110111': 1, '1
000001000111100': 1, '1010010000101001': 8, '1010101000101000': 14, '110010100000100
1': 2, '0100010010110111': 2, '1110110001000101': 1, '0111011110000011': 27, '111010
0001101000': 130, '0010000101111100': 1, '0101110011111101': 1, '0011000110101010':
23, '0101011010010011': 12, '1100001000000010': 88, '0001111000001001': 58, '0101110
110010111': 4, '1011110100000001': 8, '0101101000101000': 14, '0111111000110101': 2,
'0000101101001000': 17, '0110000011101010': 1, '1110101110010110': 3, '0111000110100
111': 1, '1110010000100001': 2, '1010010111010110': 1, '0000111000101000': 1, '11001
11000000001': 10, '1110110111000011': 30, '0011000011001010': 1, '0001110111111101':
4, '1010111011011101': 1, '1110000110010111': 2, '0001011001101010': 17, '1000000011
101110': 1, '1101111110010111': 5, '1100111001010101': 17, '1000001000100010': 8, '0
001101111101000': 30, '1010101101111000': 1, '1010101001101000': 21, '001100100110100
01': 1, '0010010000000010': 1, '0101111111001000': 1, '1110010101100000': 1, '011110
0110011100': 3, '0001111100000101': 3, '0111010000100011': 7, '0001100100101000': 5,
'1000001111111010': 2, '1010110001110001': 2, '0011000010010010': 1, '11001010111111
00': 6, '0011100000111001': 5, '1000011110010011': 2, '1110010111110011': 20, '00110
00010000010': 11, '0110011011100011': 6, '1010001111001010': 7, '0111001110010110':
16, '1000011100010111': 4, '0001011101101010': 5, '1100010000110111': 21, '110001111
1011110': 10, '0101001001000010': 64, '1011100000111100': 67, '0011100110010111': 1,
'1110100001110010': 2, '1110110001110101': 76, '0111011011010111': 1, '1110011011110
111': 16, '0110010011010011': 2, '1011100100101000': 4, '0010110001111001': 3, '0111
100000001000': 2, '0101101101000000': 1, '0001101000001100': 14, '1111101000111100':
1, '0001000001011010': 1, '0011110000100001': 137, '1011101000101000': 3, '011111110
0010101': 1, '0001001001100010': 106, '1010110011011101': 6, '1010111001100001': 2,
'1000000101011100': 3, '1000111101011101': 28, '0010001011011110': 2, '1100111011000
011': 12, '1110010010100011': 39, '0000100001001000': 1, '1000101001010100': 1, '110

0111100000101': 2, '0110010001110111': 30, '0001001001100011': 1, '101010010110100
0': 61, '0001111010111000': 3, '1000011001011100': 1, '0011101100000001': 1, '111011
1110000101': 2, '0011101110101000': 11, '0011000010001010': 26, '0001001000111100':
28, '0100010101110111': 3, '0111010000110111': 111, '0111111000101001': 1, '00011111
00010101': 28, '1010010100100011': 2, '1001111000000001': 4, '0001001101111111': 1,
'0010000101011100': 7, '0101111000110001': 20, '0111000111010110': 75, '010101101100
0110': 1, '0100101101000000': 2, '0110010011100011': 60, '0111110011110101': 145, '0
101011111110101': 6, '0110001001101001': 1, '0000001011111110': 13, '111001010110011
1': 1, '1000101101011001': 3, '1110011111100111': 1, '1000100011110110': 1, '1110000
011111110': 134, '1100010110010011': 2, '1100101101011000': 17, '1110000001010100':
1, '0111110110110111': 14, '0101101110000110': 5, '1001110000101001': 1, '0011000100
110010': 2, '1100010100000011': 16, '1110110111001101': 8, '1101011001100010': 3, '1
001101010100011': 1, '1010100010111100': 26, '1100011011100010': 4, '111011001010000
1': 1, '1110101001111100': 50, '0010000100101010': 4, '1100001000110010': 18, '01110
00001100010': 122, '1000101101111000': 5, '1001001001000010': 2, '1000111001111100':
18, '1110010101001010': 1, '1010001001111100': 4, '1001101000001001': 1, '1100010011
000111': 2, '1010000011001010': 18, '0011100111101000': 29, '1110100001011100': 110,
'1011010100010111': 10, '0111000000000010': 9, '1000001011011110': 63, '000111000010
1001': 12, '1010100110111100': 6, '0101110110100011': 4, '1100101001101001': 3, '001
1000110000111': 1, '0000110010111101': 1, '1010000100001010': 181, '111100011000001
0': 6, '1110111001001100': 1, '0011100011101100': 6, '0100110110000101': 1, '0011100
100000001': 4, '1011000010111110': 31, '1110011101010111': 15, '0111011100110111':
2, '1101110100010101': 1, '1100100111010110': 4, '1110000011011110': 47, '0011010001
100111': 10, '1101011111010011': 2, '1011110100111101': 1, '1001101000101100': 3, '0
111001010100011': 3, '1110000111110110': 60, '0011000100000010': 14, '01100000000101
11': 2, '1100011011101011': 9, '0101100001110100': 1, '0111100100101000': 2, '001111
0001010111': 2, '0011010111011111': 1, '1000000001111100': 2, '0001001100000010': 2
1, '1100101010111110': 3, '1001011000111101': 3, '0011100110011100': 17, '0011000111
110110': 18, '1011010110000011': 18, '0111000111011000': 1, '0000101101011000': 2,
'0001101100111100': 173, '0100001101110111': 1, '1010100110101000': 20, '01110001101
10111': 5, '1110101000101010': 1, '1100011101101001': 7, '1111101000100001': 1, '110
0011010110101': 19, '1110000011000110': 13, '0001011011110111': 64, '001111010110001
1': 1, '0001010011110111': 7, '1001110011111101': 1, '0101011001101010': 2, '0001001
110000010': 31, '0101001110011110': 11, '0100011100001010': 3, '0111000110111110':
5, '0101010010100111': 1, '0101110000110111': 3, '1010100101001000': 178, '011011000
1100001': 22, '1001101011011000': 1, '0000101010111100': 2, '0011110010001000': 10,
'1001101110011100': 3, '0101111010110101': 6, '1100010011100111': 7, '000100101111110
11': 1, '0001111010001000': 7, '1100111000010101': 1, '0110000000100010': 32, '10000
11100001001': 5, '0011100110001110': 4, '0001000111010111': 3, '1110110001101100':
2, '0001010110000111': 1, '1011010101000010': 1, '0001001111011110': 46, '0001101111
000000': 2, '1111100000101000': 2, '0000001001100010': 1, '1000111110010101': 12, '0
101010100100001': 3, '1000100100001000': 5, '0011110110001000': 20, '001111001110110
1': 13, '1110101010011100': 3, '0110100101000001': 1, '1110100111000101': 2, '111011
1011100011': 6, '0010100100101000': 1, '0100011111000111': 4, '1100011000010011': 2,
'1101011010110011': 4, '0001001010101110': 21, '0010001000101010': 1, '0000101110101
000': 2, '1010101100001010': 5, '1100111101000111': 1, '1110100101101000': 39, '1001
001101101010': 7, '0111100101001100': 3, '1000001111001110': 18, '1100011101001001':
16, '0011010011111101': 37, '1011110010111000': 1, '1010010011011111': 1, '101111010
0011101': 9, '1111010001100001': 2, '1001010110000011': 6, '1101111110000111': 1, '1
100111001000001': 86, '0011100111011100': 70, '1110010111101011': 3, '10100010011010
00': 2, '0111001010110110': 8, '0011101101001000': 16, '0001111011111100': 4, '10101
00100101100': 8, '1110000001100010': 50, '0100001110110110': 2, '1001101101000010':
1, '0001101011111100': 47, '1000110111101101': 2, '0011110100111100': 8, '1101001010
110011': 1, '0011000010101110': 34, '0111010011010101': 5, '0001111110110111': 5, '0
000011001100001': 1, '0011010100101001': 9, '1010110100010111': 1, '100001111010111 0
0': 20, '0101000011110010': 1, '1110100010011100': 13, '0011001010110110': 6, '01010

10110000010': 1, '0101000010010110': 12, '1011111000111101': 2, '0011100010011000': 2, '1000001110010010': 1, '1001001001101010': 28, '0101011010110011': 27, '110100101 1010110': 2, '1110100110111000': 4, '0111000010000010': 10, '1110110010101101': 4, '1100111000000011': 1, '0011111011110101': 15, '0001111010100010': 1, '0011000010000 110': 4, '0001100100111000': 2, '1110010111110111': 81, '1000011110010111': 6, '1001 100010101000': 4, '1000011011100101': 1, '1000001010011110': 7, '1000101011100010': 1, '1011010001000010': 1, '0011000110110110': 33, '0011111110001000': 3, '1100011101 110111': 80, '1000011111010011': 1, '0001101011010110': 3, '1100010011110011': 6, '0 111100001100010': 9, '0011000110010110': 114, '1001001110001010': 6, '11001011011111 00': 92, '0011111000111100': 5, '1100011000011111': 1, '0011011110011101': 1, '00111 00011011000': 14, '1001101010000011': 1, '0001100010101011': 1, '0011110111011101': 243, '0101001001100010': 139, '1000001011111110': 152, '1110101110011100': 4, '01011 01111011000': 2, '1010000100101010': 44, '0101101000110100': 7, '1100110001000001': 18, '0010110101011001': 1, '1100001011010111': 5, '0110101001100001': 1, '0110110111 000101': 1, '0001001011011100': 4, '1110010100010011': 1, '1000110011101011': 1, '11 10100100001000': 64, '1010101100101010': 1, '1100111011101001': 1, '111111101001101 01': 1, '1010110011000011': 2, '1000100001111000': 2, '1100110011010011': 1, '0001101 110000000': 1, '0101001101010010': 5, '1110100000101000': 55, '0111011101000011': 2, '1100000101101000': 1, '0101101010110110': 16, '0001011011101101': 1, '0001001100101 000': 7, '0001000110110110': 12, '0111110010100011': 52, '1100001111110110': 57, '11 10001111101000': 1, '1100111100001000': 7, '1100011011001010': 1, '000110101011110 0': 8, '0100101011101110': 1, '1011110011111101': 35, '0011010111100011': 2, '010110 1000010101': 2, '1000100111001000': 6, '0101110100010100': 1, '0011011101101000': 1, '1011011111010101': 1, '1110111010111101': 27, '1011111111011101': 2, '1100101100001 100': 11, '0011100001111010': 1, '0101001110100010': 19, '0100101110101000': 2, '001 1101100101000': 15, '0111110010101101': 3, '1010001111011110': 37, '000110110000000 0': 6, '0111100010100011': 7, '0010001111001010': 1, '0100101010111110': 1, '1110110 011111101': 22, '1011010111010101': 3, '1000101101001000': 150, '0001011001101011': 3, '0011110011110101': 118, '0011001111111110': 1, '1100001111101000': 6, '101000010 1001000': 17, '0101011101000010': 11, '0011110011011101': 66, '1011100010101100': 1, '0011011110010011': 2, '1100111000101001': 52, '1100011010111110': 2, '0110000001000 010': 3, '0001101000111001': 4, '0001101010001110': 2, '1011111110010111': 1, '00010 11000100011': 9, '1110000001110010': 14, '1010110001011001': 10, '0111000100111100': 3, '1110010001000010': 1, '1001111010011101': 3, '1010001000101000': 1, '00010110001 10111': 107, '0001101100010001': 1, '1110000010001000': 2, '1011111110000011': 1, '0 111110110100101': 3, '0111000001101000': 1, '1000001010111100': 3, '110011011001010 1': 55, '0001001001110011': 1, '1000111111001101': 12, '0101101100010001': 5, '00011 01010111110': 35, '1101010001100011': 1, '0011001000111100': 8, '1100111011001000': 1, '0010111100001010': 1, '1100111011001101': 4, '1000101001011100': 124, '101110111 0011110': 1, '1110000011001000': 5, '1100100001100100': 1, '0001001001101000': 13, '0110100001001001': 1, '0001010010100111': 2, '0111010001010111': 22, '0001111100111 001': 7, '0100001111100011': 1, '0001101101101000': 28, '0001110000100001': 21, '011 1000100000011': 3, '1110000010010111': 3, '0101011110010011': 23, '010110111000100 0': 11, '1010011111110111': 1, '0011000000010111': 4, '0100110101000001': 5, '110001 1000100001': 1, '0111100010110011': 1, '0011100001101100': 16, '1011110101011001': 1, '0001101000110111': 3, '1101101010110111': 2, '1000110010011101': 7, '11001100011 10111': 2, '0101000100100010': 2, '1011101100011100': 9, '1100111101001000': 6, '010 0110001110101': 3, '0111010101000111': 23, '0111110010000101': 3, '011100001110010 1': 1, '1110000010101000': 5, '0001111101001001': 62, '0101001010100010': 31, '00111 11011011101': 6, '1100001101011010': 5, '0000101001101000': 11, '0001011100111001': 1, '0101110000110001': 2, '1010000111111110': 59, '0001001000001000': 8, '0110100001 101001': 2, '0010000000101010': 13, '0100010111100011': 3, '0101010111010111': 5, '0 000011111111111': 1, '0110110110010101': 14, '1100101001001000': 38, '01000011110001 10': 3, '0011101011011000': 1, '1000001001110111': 3, '0010100100001100': 3, '111010 0110010110': 10, '0011110010011101': 19, '0000011000001010': 1, '0101011110100110': 2, '0001110110111101': 1, '0011110100101001': 101, '1100011001100111': 9, '101011000

1110111': 2, '1011101001001010': 1, '1100001011100110': 39, '1010100001101001': 16, '1010100111001100': 2, '0011100011000000': 1, '0011001011101000': 2, '11000001101101 10': 7, '0101111111001101': 2, '0001001111110110': 29, '0111010011110111': 94, '0001 011101000011': 26, '1111110111010101': 7, '1110010001100010': 3, '0010100110001000': 8, '1100011111110111': 84, '0110110101000101': 1, '1010001011101010': 8, '0011110100 000101': 4, '1100110010100101': 7, '0111010110010011': 17, '1110100101000000': 6, '1 110110100100111': 2, '0110000010110110': 12, '0011110110101101': 9, '011111000011010 1': 37, '1110001111010110': 13, '1110100011011110': 2, '0100001011001010': 1, '10100 00011011110': 74, '0101001011010110': 32, '1100101001101100': 21, '110100110100001 0': 10, '0011101011111100': 11, '0001111001101001': 113, '0011101101001100': 4, '000 1111011111000': 1, '1010100100101000': 32, '0100101101001000': 8, '001101011001101 0': 1, '0000111001001001': 4, '1100010111000111': 7, '0011000011111110': 30, '000110 1011001000': 46, '0011001000100010': 2, '1000111101000001': 13, '1101111000110111': 2, '0111110110000011': 34, '0110010111000111': 10, '0011110000011101': 29, '00110001 00101100': 3, '0001111001001001': 23, '1110010010110110': 7, '0000111001011100': 1, '1111110100001001': 2, '1001000111001000': 1, '0001111101101101': 2, '11110100101001 11': 3, '1100111100000001': 39, '1110000101010111': 11, '0110000101101100': 1, '1011 000101001010': 35, '0100011001110001': 2, '1110000101011010': 9, '0101010001100011': 8, '1010100001101100': 29, '0111010000110010': 1, '0000101100001000': 8, '1001011110 010111': 8, '0101101001101000': 4, '0110000111100011': 2, '0000111110011101': 9, '11 00101001110100': 7, '1010000011111000': 1, '0111000100010010': 7, '000101100011100 1': 1, '0101001000010111': 4, '0001100000101000': 14, '0101101110010010': 2, '100011 0101001000': 2, '1110110110000101': 17, '0101010101010111': 17, '0101011000000001': 6, '1010011011101111': 1, '1110011010110111': 4, '0011111010110101': 1, '00111000100 11110': 10, '1010110110010101': 10, '0001100011111000': 3, '1000101101011000': 22, '1110011111100110': 1, '0001011100000101': 1, '1111100010111110': 1, '11011010000111 00': 1, '0111000110000110': 26, '1110111000110101': 1, '1110000100111010': 3, '01100 10011100111': 4, '1010001011111110': 32, '0001101100001001': 13, '0101111100100111': 1, '1010100110011110': 2, '0110110111000011': 1, '0001001011011110': 8, '10001100111 01101': 1, '0011010110100011': 76, '1000111000100011': 3, '0011011000011001': 1, '01 01001000101100': 1, '1100001101000010': 74, '1110010000100011': 62, '100000101110101 0': 29, '1110001011100110': 1, '0011100000111000': 50, '1110001101111101': 1, '11001 11110111101': 39, '1110100000001000': 25, '1000000110010110': 2, '0101111110110111': 8, '0000101111011101': 1, '1010110110011101': 139, '0101000010110110': 28, '10100111 00111111': 1, '1100000011010110': 10, '1010111110111101': 6, '0011000010000011': 3, '0001111010100111': 2, '1010101010001000': 4, '1110110101011101': 30, '1110100100011 010': 1, '0101101011010110': 2, '0010100101001100': 4, '1100011111010010': 1, '11011 01110000010': 2, '0111110101000011': 3, '1100001111001110': 14, '0001101001111010': 2, '0101000000010010': 1, '0100011011000101': 1, '1100000001110010': 4, '00111001001 01000': 72, '1100100001101000': 7, '0101101100000010': 6, '1100111010011101': 32, '0 100010100100111': 1, '0111000110010011': 2, '1100111101101001': 39, '100010100111100 0': 12, '1100011001000001': 12, '0011011011110111': 2, '0001101111011100': 68, '1101 011100010111': 13, '1100001010110110': 113, '1010110111011101': 26, '101010010111100 0': 8, '0000101110011101': 1, '1001111011010101': 4, '0001110111110101': 3, '1110011 011110011': 2, '0001010001000111': 1, '0011000011111100': 5, '1100011000000011': 31, '1110100011100000': 3, '0001111000111101': 68, '0001011001110111': 48, '111000000100 0000': 1, '0111110111100101': 2, '1100001101110010': 13, '1100110101110001': 3, '101 1000110000010': 3, '0110100010101000': 6, '0111100010110110': 23, '100000111101100 0': 2, '0001111100101101': 3, '0001100101001010': 1, '1110110101001000': 12, '001100 1010111110': 37, '1110000001100111': 1, '0001110000010001': 2, '1101111001101001': 1, '0011010110000010': 4, '0001111001011001': 1, '0111000110110110': 53, '0000100110 010110': 1, '0011100110111000': 1, '0011110010001011': 2, '1111010111010011': 3, '00 011101000010111': 2, '0100111001101001': 6, '1010100010111101': 9, '110001101110010 1': 3, '0101010010110111': 35, '0011011011110011': 1, '1100011001000101': 1, '101001 0000100011': 5, '1110100100011100': 5, '0000001111101000': 1, '1100110011110111': 6, '1010101101111100': 26, '1100111101110101': 22, '0001001101011010': 23, '01110011110

11000': 1, '0111110100100101': 2, '1011010011100011': 1, '1110111101011100': 1, '001
1001010101110': 3, '1010010011000111': 1, '1100010010110110': 1, '1000111111101101':
3, '1001111100011100': 4, '1110100010111000': 9, '0101011110001010': 1, '00110110011
10111': 6, '0110010100000011': 4, '0100111011111101': 1, '0001011000110101': 3, '101
0011100001010': 2, '1100101001111000': 11, '0011000110010010': 3, '100100111000111
0': 1, '0111101100010101': 1, '0011100010011010': 1, '0111110011010101': 38, '110101
1100000001': 2, '1110100110011100': 25, '1001101111011000': 3, '1110000011010110': 8
2, '0011010001000011': 10, '1010010110010111': 3, '1011100001100010': 3, '0001111101
101001': 42, '1100011110110011': 7, '0110110100000001': 2, '0000011001101001': 2, '1
011000100011100': 4, '0100011000100011': 5, '0011010100100001': 4, '010101100111011
1': 57, '0000010001110111': 1, '0111001000100001': 1, '0011101010001000': 21, '11000
01111111110': 34, '1010111110001000': 1, '0011100010111110': 50, '0011010001001111':
2, '0010100011001000': 6, '1111110100000001': 11, '1110011000110111': 8, '0001110100
110101': 3, '1101010010000011': 1, '1100001100101010': 41, '0101001111010110': 86,
'0011101110001000': 47, '0000001101011100': 4, '1000101100001010': 25, '000101111101
0011': 13, '1000100101101000': 3, '0010010001001001': 2, '0101101001100011': 1, '001
1010111110101': 4, '0100101010111101': 1, '0110101000000000': 1, '0101101110100010':
2, '0011000011110111': 3, '0010100011111101': 1, '1000111110111101': 54, '1010110101
101001': 47, '0011010110010111': 93, '1111000000000010': 4, '0011001111010110': 5,
'1100101000100010': 34, '1110100001111101': 4, '1110110001111100': 11, '110010101011
1000': 17, '0011100110011010': 1, '1011100000110101': 1, '0001111000110001': 15, '00
11101000101000': 47, '0010000111001110': 3, '1100011111100110': 1, '110110111001011
0': 3, '0001111011010101': 27, '0111110010000011': 6, '1110100101100001': 10, '11101
10100000010': 1, '0111010101000001': 1, '0000110001111001': 1, '1011100100111100': 2
8, '0011010011000101': 1, '1110100011101010': 1, '1111110000110001': 1, '01000010101
11110': 2, '0000001110001000': 1, '1101110111010101': 8, '0010000011101000': 2, '001
1100101001001': 9, '0011011111111110': 1, '1100001001011010': 3, '0011111010001000':
1, '0111100011010101': 2, '0001011110110110': 4, '1000100000001000': 3, '11100100110
10111': 69, '1110011111010011': 4, '1010100101000001': 1, '1100001110001010': 2, '00
01011111110101': 5, '0001111110001011': 3, '0101000010100011': 4, '1110001100101010
0': 6, '1011110000110011': 1, '0010100101011100': 51, '0010110110011101': 19, '01010
11011110110': 5, '1111100100111100': 2, '1110101000101001': 1, '0001100000100000':
1, '1101011101100011': 1, '1011110000011101': 4, '1100010001100001': 4, '11000100110
10011': 3, '0101111011000101': 8, '1100001000010010': 3, '1010111101001000': 1, '010
1011010110110': 10, '1100101110101110': 1, '0111111011001000': 1, '010101010100011
1': 6, '0111000010110110': 123, '0001011010110111': 123, '0111000010110011': 2, '010
1111110000101': 7, '0011100011111100': 67, '0001101110010110': 22, '111011000011000
1': 2, '1110110010011101': 41, '0000111101101001': 2, '0100111100100011': 1, '010100
0011110110': 18, '1110000001110111': 12, '0111000000100010': 19, '0001110000000101':
1, '0011000111011110': 39, '1100011101010101': 11, '0111010100110001': 2, '101001000
0101010': 12, '1110110101010100': 3, '0111000011110011': 1, '0001101111010101': 6,
'1011001111111100': 1, '1000001011011010': 1, '0110000010010110': 2, '00001010010010
00': 3, '1111000010100011': 1, '0110011111010111': 1, '1101011010100111': 2, '001111
1000101000': 2, '1100011000100111': 34, '0101001010001010': 3, '1110001110001000':
1, '1100111000100011': 12, '0110000001110010': 2, '1101111100100001': 7, '0100001011
110111': 4, '1010111101111100': 2, '0011101011111101': 1, '0001110000101101': 1, '10
10010100010111': 4, '1010100010011100': 13, '0001111101000010': 3, '010101001001001
1': 4, '0011100011111101': 17, '1110010011100111': 39, '1110100101000100': 1, '10010
11010111110': 2, '1010010001111101': 5, '1110110100100011': 2, '0111110001100010':
2, '1100111010100101': 23, '1110000101110101': 2, '1110100011111100': 7, '0001101101
100010': 3, '0011111001001001': 5, '0100000111110110': 2, '0100011000101010': 1, '00
11000010111010': 11, '0000101100000010': 1, '0101101001100010': 10, '111001001111001
1': 37, '1100011011011110': 5, '1010010001101000': 3, '0101111001101001': 6, '001101
1001101001': 1, '0110110001001001': 4, '1000100101101100': 1, '1110101111001000': 1
8, '1000001011111111': 1, '0111110000010111': 2, '1001101001101000': 14, '1011110000
101100': 2, '1100101101100001': 6, '0011100010111000': 11, '0001001011010110': 37,

'0101101100000001': 16, '0111100001001001': 1, '0000101011101000': 11, '100100100100 1010': 10, '1110010101000010': 5, '0001010110010011': 1, '1010100000111000': 1, '011 0000101010010': 3, '1011011010011110': 1, '1100001101000000': 2, '0101111011011101': 8, '0011110110000011': 28, '0001001011101000': 15, '0101111110100011': 14, '01000011 01000010': 10, '0111000110100010': 9, '0101011101100111': 6, '1001010000110111': 4, '1010000001101000': 18, '1101001001000010': 3, '0101101110100011': 2, '1010000000111 100': 1, '0011000011110110': 44, '0101011000110101': 4, '0011110100010111': 8, '0110 010100001011': 1, '1110100001110100': 9, '0111100000100001': 17, '1110110001110011': 1, '0110110110111101': 7, '0011010100111001': 3, '1001101111001000': 11, '0001011110 010011': 18, '1110100000111100': 3, '0101110011010101': 4, '0011100000001000': 96, '0101111101010111': 3, '0101001111110111': 3, '1110001100001010': 20, '1010011111011 110': 4, '1110101011101000': 14, '0100011000000111': 1, '0011000010001110': 8, '1010 110001001101': 1, '0001001010110111': 11, '1000011110011101': 5, '1100011000000111': 7, '1101100000000000': 1, '0001101001010101': 1, '0110011111110111': 2, '11001010111 01100': 1, '0011101111101000': 4, '1110100111000010': 6, '0111010110100010': 1, '101 0000111011100': 2, '1011101101001000': 4, '1001001100001000': 2, '1110000111010010': 8, '0011110000010001': 2, '1110100111010111': 1, '0111010111110111': 27, '0011101100 111100': 31, '1101011110010111': 25, '0110010000100111': 4, '0001011110110011': 13, '1011100010111110': 4, '1111110101101001': 2, '0001000000101000': 1, '10001110011110 01': 21, '0101101011010101': 2, '0100011001000001': 1, '1011110000101001': 32, '0001 111101000001': 6, '1010101000101100': 3, '0101010010110110': 3, '1100111110011100': 2, '0000100110001000': 1, '1111001110110110': 1, '0111000101001010': 15, '0011000010 100111': 1, '0011110100110001': 5, '0011100101001010': 21, '1001101000111100': 55, '0111000110110010': 1, '0111101010110111': 1, '1110010101001100': 2, '11000011110101 11': 15, '0110111100001100': 1, '1000011101001000': 1, '0001110011011101': 7, '11001 11010100011': 1, '1100111101100001': 104, '0101100011110101': 1, '1110100101000010': 5, '0111010101100010': 7, '1110110100100101': 1, '0111100101010111': 1, '11000110111 10110': 16, '0011100011010101': 4, '0011010010001110': 1, '0110100010110011': 22, '1 000101001011000': 7, '1100111100001001': 56, '0101010010100011': 76, '00110011000110 00': 1, '1100000011100111': 1, '1001101100001000': 20, '0111110110010011': 3, '01100 10101110111': 16, '1100100111001000': 5, '1100111110010011': 4, '1110100100010010': 3, '1110110101010111': 13, '0001101111010110': 5, '0101010100000001': 1, '1001001110 100011': 6, '1100011001011101': 1, '1000111001001001': 32, '0011000000101100': 2, '0 001000110011110': 13, '0110100110011101': 2, '1110000100100010': 66, '10110100101001 11': 2, '0011010100111100': 1, '0001101110011000': 3, '1001001111010010': 1, '011001 0111110111': 7, '1100111101011001': 20, '1110100101011000': 27, '1110110100010101': 3, '0011010101100011': 9, '1000111011100011': 2, '0101101011110101': 15, '1010110001 101000': 10, '0011110010010111': 3, '1110010001000001': 16, '0110100010110110': 10, '1000111110011101': 128, '1110110001011101': 10, '0011000110101000': 6, '11100010000 000010': 2, '0100001111010110': 7, '1100001110001110': 1, '0001011100110010': 1, '111 0011111010111': 10, '0111011110110111': 3, '1000011100101001': 4, '0001101101001111 0': 16, '0110000011111110': 12, '0001000111110111': 1, '1011110010111101': 3, '01000 11011011110': 1, '0111000110000011': 16, '1010111101111101': 4, '0011100001001010': 9, '1111100100010100': 3, '1011100110101000': 8, '1010111100110111': 1, '11101000001 11010': 1, '1100010111010011': 6, '0101111101010101': 4, '0101101101001000': 4, '011 1100000000000': 1, '0101000010000110': 2, '0011110110110110': 1, '0101011011100011': 9, '0011000111001000': 12, '0101111010000011': 11, '1001001111001000': 5, '000100110 1001010': 283, '1101111000100001': 11, '1100011010100110': 1, '1110110011100101': 4, '0001101011011000': 10, '1000100110011000': 1, '1110000010110111': 7, '0101010110010 011': 6, '0011110100011000': 2, '0111010000000010': 1, '0001001010101010': 59, '0101 111011010110': 1, '0011001011111110': 8, '0111010010110101': 1, '0001110100000001': 33, '1010110101111101': 23, '0001101101101010': 5, '0110000010011100': 1, '111100010 1001010': 2, '0110000010001110': 1, '0011110001001001': 35, '1110110111011101': 23, '1100101101000000': 7, '1011100101001000': 10, '0011110110111101': 27, '110000000111 0111': 3, '0001101110000010': 6, '1100011011111011': 2, '1101101010000110': 1, '1110 100101111000': 5, '0001011110011101': 4, '1110011111000011': 30, '1000101001101001':

11, '1010001011101000': 4, '0110110000100001': 3, '1001101000001000': 10, '1100001001010111': 4, '0011110010011111': 2, '1010010110111100': 1, '1010001110111110': 1, '1011001010111110': 5, '1100011110110111': 36, '1010101001001000': 13, '0001101111110101': 3, '1100010110110110': 1, '0100011100000111': 6, '0101001110010011': 3, '1110100010110000': 1, '1100011001010101': 1, '0000111101111101': 1, '1101011011110101': 3, '0101010011000011': 1, '0101111110110011': 5, '0001101101101100': 6, '1000001011010110': 7, '0011000101101010': 75, '0000101110011000': 1, '0001111011001101': 4, '1001101000011000': 2, '1011110100100001': 5, '1010010011000011': 12, '0011001010101010': 9, '1110000110010101': 1, '0101101110101000': 5, '0100011011000111': 2, '1100011100110111': 39, '1010000101011010': 5, '0001011010111110': 23, '0110100110011000': 4, '1000011010100101': 1, '0001010111111101': 1, '1010111100001001': 16, '1110110000000010': 1, '1000011011111111': 3, '1010101101001100': 2, '0010100011101100': 1, '1000011100100011': 3, '1010100011001000': 54, '1010010101011101': 5, '0111100111010101': 12, '0011010001100010': 7, '1101011111010110': 1, '0001111000001100': 1, '1110000111000010': 90, '1010100111011100': 7, '1101110011010101': 1, '0101001010111110': 14, '0011111000011101': 6, '1111010100010111': 7, '1100110101110111': 1, '0011000100100001': 2, '0010000101001000': 1, '1011000010001110': 1, '1100000111000011': 9, '1001000000111100': 1, '0100101101100001': 1, '1100111000001001': 17, '1100111000100001': 30, '0100101111001101': 1, '1111000010100010': 5, '1100101011000010': 3, '0011100001101101': 1, '0011111000101001': 35, '1001011100010111': 11, '1010101100101000': 5, '1000101000111100': 7, '1110100100001010': 18, '1010000110010110': 8, '0100011111011101': 1, '1010101100001100': 1, '1100111101000101': 8, '1110110100001001': 60, '0111000011101000': 1, '1110001000101010': 17, '1000101110110101': 1, '0111010010100111': 22, '0101101111110101': 1, '0110111010110111': 1, '0011110010100011': 43, '0011010011010111': 14, '1011100110001010': 3, '1010000101111100': 17, '0001011000100111': 2, '1110000001110110': 1, '1000011001100001': 3, '0001010100010111': 19, '1001001011111110': 2, '1000100001101000': 5, '0101111000000001': 49, '1100111000000010': 4, '0111000010000011': 3, '0011111010111110': 1, '0111101000110010': 1, '1100001101010010': 20, '1100110101010101': 5, '0001000110001010': 5, '0011000000111100': 56, '1000011001101001': 16, '0101111110010111': 10, '1111110001110111': 1, '0101001100110010': 4, '1000000011011010': 1, '1110110110010111': 11, '0001011010000111': 7, '0111110111110101': 50, '1001011001000011': 2, '1010110001101101': 1, '1100010010011101': 1, '0101010100110001': 2, '1100101111000000': 2, '1010001101101000': 4, '0110000111110011': 1, '1110100100111010': 1, '1010001110011110': 2, '0101010110100110': 1, '1010100100001010': 22, '1011000101100010': 4, '1111000010001110': 1, '1100000101010111': 3, '1101010010110110': 1, '0100010101000001': 1, '1110101011111110': 1, '0101111001100001': 10, '1010001000001010': 12, '0011011010000011': 2, '0101110000010111': 4, '1010111011101000': 1, '0001011010010111': 42, '1011100010011100': 1, '1100011101000001': 37, '0011110100011101': 84, '1011110001100001': 2, '0101011111110110': 8, '0101001110000011': 19, '0100011100010111': 11, '0110001011111110': 3, '0011000111010111': 5, '0011000010101011': 1, '1100110010111101': 6, '0011110100111101': 33, '0001101011111101': 11, '0011110010111101': 63, '1011101110001000': 7, '0011000101100010': 37, '0101111001010101': 2, '1110001111001110': 1, '1000101001111101': 5, '1001011010110111': 10, '1001110110101000': 1, '0111011010000011': 6, '0001101001000010': 2, '0011010010101011': 12, '1011010011111101': 6, '0011111000111001': 7, '0011000000101000': 12, '0111010111010011': 8, '0011100000011001': 1, '0011110110011110': 4, '0011010000110111': 100, '1100001001111010': 4, '0001101001101001': 1, '0001010110000011': 53, '0110110010111101': 14, '0011111101001000': 5, '0110010111100011': 18, '0011100100101001': 5, '0101000110110110': 7, '0001011010011111': 6, '1110101011101010': 1, '1000101011011100': 1, '0111100100010001': 4, '0111110000100010': 1, '1001001100110111': 1, '1110110000101101': 2, '1110100001001010': 1, '0001101100101100': 8, '1010100010001000': 32, '0001001111110101': 2, '1110101101011100': 44, '0001101111111000': 12, '1110110010001000': 1, '1101011100100001': 1, '1100001011000010': 35, '0001010110100011': 19, '1111110100011101': 1, '0011100010110110': 21, '1110100100001100': 12, '1011000010101000': 2, '1000101000111010': 1, '0111100000110100': 11, '0111111001100001': 1, '0001001001000010': 34, '0100100111010110': 1, '1000101010111000': 14, '10011

01011111100': 4, '1010111101011001': 5, '0111000001110111': 4, '1110101110011000': 6, '0101110100000001': 33, '0101111000001000': 1, '0101101111011100': 1, '1110100000000010': 13, '0101000101110111': 1, '0001001110010111': 4, '0011100010000011': 1, '0011110111101101': 5, '0001111010111101': 56, '0000111010011101': 4, '0001011010100010': 1, '0111000010100110': 11, '0101010100010101': 1, '0001101001101010': 14, '1100111100010101': 3, '1100111010110111': 20, '1000011101001001': 18, '0011010001000111': 5, '1001101100001100': 4, '0011001100011100': 11, '0100111000110111': 1, '0010100100001000': 11, '0011101011011100': 4, '1011111110011101': 1, '1000110101101001': 6, '1110000001111010': 5, '1100010011100011': 114, '0101011111010101': 20, '0101011100100011': 2, '0001001001111010': 16, '0101101100011100': 30, '0001010000110111': 25, '1110100011001000': 35, '1010010101011100': 4, '1000000111111110': 3, '1011000110101110': 2, '1110110110100101': 7, '0000101000101000': 7, '1100011100001001': 3, '1111010101100010': 1, '1011110011111000': 1, '0111111100000001': 12, '0011000110000010': 24, '0111101000111100': 4, '1100110101011101': 4, '1100001101011100': 49, '1001101110000000': 1, '1010001011001110': 2, '0111000110001010': 4, '0100011011010111': 6, '0110110011100111': 3, '1011010001101001': 4, '1110010010111101': 9, '0001111100001011': 1, '1110101010001000': 1, '0000101101011001': 1, '1000001110001110': 1, '0000111110111101': 6, '0010101101111100': 2, '1101010110000011': 5, '0110110001100101': 1, '0101001110101110': 1, '0011001100111100': 1, '1001111010100101': 2, '1000000000111010': 1, '0101101111000101': 2, '1000111101101001': 51, '1100101100100010': 15, '1100001111100110': 14, '0001111010001011': 1, '0011000111001110': 4, '1101001110000011': 2, '0100101011000011': 1, '0001001110111010': 1, '1100101111101100': 1, '0011101011101000': 21, '1010000000110010': 2, '0101011000111101': 1, '1001111101000001': 2, '0111110001110101': 5, '0111010101110111': 16, '1000101001100001': 2, '1100011111111111': 1, '1000111011101101': 18, '1000001011011100': 1, '0111110000010101': 12, '0111100100001000': 19, '1000001011111101': 1, '0100101110010110': 2, '0110100010110111': 14, '0001011100001001': 13, '0101110000000001': 11, '0001010010110111': 23, '1010111010101101': 2, '1110100010011101': 2, '0001111101011111': 2, '1100111001001000': 3, '0111110110010111': 20, '1100000011100011': 13, '0010100101111100': 14, '0110010101110011': 1, '0111001101101010': 3, '0001010001110111': 10, '1000000000101010': 8, '1100110110111101': 1, '1100010110010101': 7, '0001110111010101': 15, '0111101101011011': 11, '0011000011101000': 14, '1011001111011110': 2, '1100011100110011': 2, '1100000001110100': 1, '0100011011000011': 13, '0001110001000001': 3, '0001011001100010': 13, '1110000000110011': 1, '1110001111000010': 6, '0101100011110110': 2, '1000001110110110': 2, '1110100101000001': 16, '0111110001100111': 2, '1111001101000010': 2, '1100011111100111': 15, '1001111110011101': 5, '1000111010110101': 12, '0100011001010111': 5, '1010100001011000': 12, '1100101111110110': 8, '1100111011101101': 7, '1110001001000010': 2, '1000100101111100': 9, '1011100000001100': 1, '1110110101101000': 1, '1110000111000110': 35, '1000110001001001': 4, '0101101100010100': 10, '0001001001001000': 3, '1010100101001100': 23, '1100011111000111': 38, '0100011000110111': 19, '0000011001111001': 1, '0001111000110111': 15, '1100101000111010': 1, '1110100111110110': 3, '1000101010101000': 54, '0111010111010110': 2, '0000010111001000': 1, '1010111001111100': 5, '0101001110010111': 9, '0100011100000011': 7, '0011110101000001': 7, '1000100001001000': 2, '1011100100011100': 70, '0100001110010111': 1, '1111010110010011': 7, '0001011111001011': 1, '1010000100011010': 15, '1110011000100011': 9, '1000001000011010': 6, '1001011010001010': 2, '1010101011101000': 15, '0110000010110010': 1, '0101111100001000': 1, '1010000111100010': 3, '1110010110010110': 7, '0111110100101000': 1, '0111000010011110': 5, '0000011010011101': 1, '0001001111011100': 7, '0011010001110111': 40, '0001101100001100': 47, '1001100011001000': 1, '1100001111110010': 5, '1010001100101010': 9, '0011110001101101': 2, '0011000101111010': 6, '0001011011110011': 10, '1110000011000010': 20, '1100101000011100': 3, '1011010001110111': 8, '0011000110100011': 7, '1010010100011111': 4, '0011111110001101': 5, '0001011000000010': 2, '1110011010111110': 1, '0001101100010100': 9, '0001011000110010': 2, '1110101111011100': 2, '0100010110011101': 1, '0011110010110111': 20, '1010110101011100': 29, '1001001011110110': 3, '1000001011111010': 4, '1000101110011000': 15, '1110001111110111': 1, '1100111100110111': 4, '0001100100011001': 1, '0001111001110111':

4, '1010111100101001': 7, '1001111010011110': 1, '1110010001000011': 4, '01011011000
10101': 2, '0010010011011110': 3, '1001100110111110': 1, '0000011011110111': 1, '001
1101000000001': 1, '1011110111110101': 5, '1010010001110111': 6, '1001011010110110':
1, '0010101101101100': 1, '1110001111001101': 1, '0011110110100011': 12, '1001001101
001010': 30, '0100010011100010': 1, '1000001110101110': 1, '0111010000010111': 29,
'0011000101000001': 1, '0010000101101000': 1, '1101011101110111': 1, '00111000100111
00': 9, '1010111110001101': 3, '0001110101101001': 4, '1110010001101001': 17, '01110
11010111110': 1, '1100010101110101': 1, '0110101110011100': 2, '0111100110110110':
6, '1010000101000010': 8, '1110100010000000': 1, '1110010000110111': 130, '100000100
0001010': 55, '1000001111001010': 40, '1110100000010111': 1, '0011000001101000': 18,
'0100001010010110': 4, '1111000101100010': 4, '1100011101011111': 1, '00010100101101
10': 2, '0001010111011100': 1, '0011010110101011': 2, '1000000000001010': 3, '010101
1011110101': 27, '0101001000110010': 6, '1100101101111000': 6, '1100000111011110':
9, '1111000111010110': 12, '1111000110100011': 3, '0001001110111110': 85, '100101001
0110111': 5, '0111010110110110': 5, '1000110001101001': 13, '1100001111100011': 20,
'0011010010011110': 10, '0011001011011000': 1, '0100101000101000': 6, '0100111100001
001': 4, '0001111100111100': 7, '1101001010100010': 5, '0111010110000111': 17, '0110
000000000010': 7, '1100111000110001': 2, '0101001101101000': 1, '0001111100110111':
4, '1001011111010111': 10, '1100011010111101': 6, '0100101100100010': 1, '1110111010
010011': 1, '1011100000011100': 17, '1101000110010010': 1, '1100100011001000': 2, '0
111110001110111': 6, '1110100101010101': 3, '1100111101010100': 1, '111000011001011
0': 124, '0011110011110111': 1, '1110000000111010': 8, '0111101001101000': 2, '00110
01010110111': 1, '1100001100001000': 8, '1100011011111110': 5, '0100110001101001':
1, '1110011001110111': 13, '1110101001110100': 1, '0001011000100001': 18, '110001001
0110101': 4, '1001111000110101': 8, '0101011001000111': 5, '1010000010001010': 1, '0
101111110011101': 1, '0001010001010010': 1, '0101000010100110': 3, '011111101101010
1': 8, '0011110110010011': 2, '1100010111010110': 1, '0011001110101100': 1, '1011000
100010010': 1, '0110000111011110': 14, '0001110100010111': 1, '1000011101000011': 3,
'1001011110100111': 1, '0111010110100111': 10, '0110000101110010': 2, '0100010111010
111': 6, '0001000011011110': 2, '1001001010100010': 3, '1110010000111111': 4, '11001
01011100111': 1, '1100110001010001': 1, '0001111000101000': 10, '0001111111001101':
8, '1001011010100110': 1, '0110110001111101': 4, '1100101110011101': 8, '01010111010
11111': 1, '0011111100010001': 1, '0011000110100010': 8, '0011101100010100': 1, '100
0111001100001': 15, '0101101000010111': 1, '0001011001101001': 10, '011111101110101
1': 6, '1100001011101010': 17, '0110101001111100': 5, '1111011110010111': 2, '010110
0000100100': 1, '1011000111111101': 1, '1010010111001011': 6, '0111100010001110': 1,
'0111100101001000': 7, '1110010001010111': 59, '1100011001100011': 14, '001110011001
1110': 48, '0001111000110101': 32, '1010000110001000': 2, '0101011110000010': 5, '00
11101110100011': 1, '1101001010100110': 3, '0011100110101000': 73, '011101011100101
1': 1, '1100111110100101': 8, '0111010000110001': 2, '1010001111001110': 12, '010110
0000100001': 1, '1001101011111101': 1, '1101010001000011': 1, '0011001000011100': 3,
'0111111101100011': 1, '1100010101110111': 17, '1110100010110101': 18, '111010100000
0010': 2, '1110011001100111': 2, '0111011001000111': 1, '1010010100101001': 3, '0001
100100011000': 2, '1001000010000010': 2, '1010100001100000': 1, '0001111100011100':
53, '1110111000101001': 13, '0110010011010111': 7, '1110101101001000': 22, '10000111
00000011': 5, '0110110111011101': 1, '1010010010110011': 1, '0011010111111101': 15,
'1000111001011101': 17, '1001101000011100': 24, '0000010011110111': 1, '000100101111
0111': 5, '0101111010111101': 2, '0011110101001010': 3, '1000011111000011': 25, '110
0001000110111': 9, '0001001100101100': 2, '1100101101011010': 1, '1010001001001000':
3, '1100100011101000': 7, '1010110100001010': 2, '1101011111010111': 8, '00110100011
00011': 29, '0011100010101100': 7, '1100101011110111': 3, '1001001011010110': 5, '00
01100100001100': 4, '0011001101001010': 45, '0110000111001110': 1, '100110110010100
0': 2, '0011111010101101': 6, '0110001111010110': 4, '0001110000110111': 4, '1101001
001100010': 13, '1101111100010111': 4, '1000011001001000': 1, '0001010111110011': 1,
'1000011010101011': 1, '1010010000001001': 3, '0011000001110010': 1, '01100100010101
11': 8, '1110111011000101': 1, '1001111111010101': 19, '0100001011110110': 22, '0110

010100110111': 7, '1000011110111101': 9, '1000000010010110': 1, '0001101100010010': 2, '1101001111000110': 1, '0010010111110111': 1, '1111000110010110': 24, '0111110100010111': 16, '0101101000100001': 11, '0111100011110110': 4, '0101101111011101': 1, '1000111000001001': 23, '1100101110001100': 1, '0011001100101000': 1, '0101011100000111': 5, '1101010011010111': 1, '1110000101111000': 3, '0111110011000101': 4, '1001110100000001': 3, '1110001111100011': 1, '1100111100000011': 8, '0111100111101000': 3, '1001110000110001': 1, '1000110000101001': 4, '0011000100001000': 15, '0110110101010101': 3, '0111010000000001': 1, '1100101010000000': 1, '1110010111000111': 28, '1110010100001010': 10, '1100011111001000': 1, '0001111110001110': 1, '0001111110100100 0': 10, '0110000111101010': 2, '1100001110010011': 1, '0101111101100001': 6, '0011010100011010': 1, '1011000101000111': 1, '1001110110011101': 1, '0101111100001001': 16, '1001011110010011': 3, '0110011010110111': 1, '0001011011011101': 11, '1110000011101110': 18, '1110010000101001': 2, '1110000000000011': 1, '0001011110001000': 2, '0001100100000001': 2, '1110101101111100': 19, '1001011110000011': 33, '0011010101000010 10': 1, '0001001100001100': 4, '1100001111011010': 2, '1010001111111110': 9, '0011010111010111': 51, '0011111011111000': 2, '1011010110110111': 3, '1111101100010010': 2, '1010100010111000': 8, '0001011101001111': 1, '0101000111110110': 3, '1010100100011100': 8, '0111110001110001': 1, '1000111110001000': 5, '0101100101000010': 2, '1000001000000010': 2, '1011100010011110': 4, '1100111001111001': 16, '1000111100101000 0': 2, '0001011111011101': 28, '0010100001101000': 17, '1110010011111110': 10, '1100011011010011': 19, '0011000000100001': 1, '1010100000001001': 1, '0000101011111100': 2, '0110010000100010': 3, '0001000110010111': 1, '1100111111010101': 1, '0001000110001000': 2, '1110010110110110': 2, '1000000111000010': 2, '1000111011101000': 4, '1010000000011010': 6, '1100110100010111': 3, '0001011110010101': 1, '1100011011110011': 59, '1011101011111101': 1, '0101101110000000': 3, '1000110000110111': 1, '1101011101000010': 2, '0100110101001001': 1, '0010100101011001': 1, '1001001111010011': 1, '1100011100100111': 9, '0100011010110111': 21, '1000111101111101': 15, '1010010111011110': 17, '1110010000101011': 2, '1010100001111001': 3, '1000101010011000': 6, '1110111001110001': 1, '0011011010100011': 16, '1100011001110101': 8, '0010100111101000': 2, '1000101001001001': 4, '1010100000101010': 19, '0100101110011100': 2, '0100011011110110': 2, '1110101100101010': 3, '0000001101110010': 1, '0011000011110101': 1, '0001111110101000': 6, '0011100000110101': 5, '1110000101111100': 14, '1010010110011101': 9, '0100011100001111': 1, '1111110011000101': 1, '0101001000100010': 21, '0001110100010101': 3, '0001101100011000': 42, '1100111001110001': 29, '1011101001101001': 1, '0001001010001010': 26, '0111000001010010': 2, '0111110011010111': 2, '1011100001101000': 8, '1001111100111101': 3, '1000011101000111': 1, '1001011110100011': 7, '0011010001001001': 4, '1010000101110111': 1, '0111100110100011': 2, '0011010001001111 1': 1, '0111101000001000': 1, '1110111010010101': 4, '1100001101101000': 4, '0011101110011110': 11, '0011111110111110': 1, '0101111110000011': 43, '1110000010111100': 1, '1011110001101001': 12, '0011100011110101': 5, '1100010010110111': 20, '1100001100011010': 10, '0100111111001101': 1, '0011110000101100': 7, '1010000111100110': 1, '1001001000111100': 4, '1000011111011101': 7, '1111011100110111': 1, '0001101000101100': 25, '1110010010110011': 18, '1101101100001000': 1, '1000111111011101': 23, '0000001011101010': 4, '1110000011110111': 9, '0001001110000011': 16, '0011000011101110': 3, '0001010011110110': 1, '1111010001000111': 1, '1100101110011110': 2, '0110110001000001': 6, '1101011001110111': 4, '1000000100001001': 1, '1100011011010111': 79, '1000101100000010': 3, '1010010011011110': 5, '0111000111100010': 1, '1011010101110111': 3, '0110000111101110': 1, '0100001100000010': 29, '1100101110111101': 8, '0111110000101001': 15, '0010110110101000': 1, '0101010111110111': 5, '0001111101010111': 1, '0100010011100011': 12, '1110110100011101': 1, '1110101001011100': 13, '1011110010101000': 2, '1100101111000110': 5, '0110101011010101': 15, '1000110100001001': 7, '1001011011011110': 1, '1010010001011101': 1, '0011110010100101': 7, '0001001111011000 00': 1, '1000101111011100': 5, '1010110011001000': 2, '1010111000101001': 23, '0011100011111000': 27, '1010110010011101': 34, '0111110110010101': 3, '1001001010011110': 9, '1000101100101100': 4, '0011011100001001': 2, '0010111110011101': 1, '0011101010101000': 37, '1100000111001010': 3, '0110101101011100': 7, '0100001101010010': 3, '00

111011110001110': 3, '0011000001110111': 6, '1000111011111101': 23, '000110110001010
1': 1, '0001011000110011': 4, '0111000000110111': 5, '1011101010001000': 1, '1010000
101111000': 3, '1100010001110111': 40, '1001010011110111': 3, '1010100000001010': 1
0, '1100010100100001': 1, '0111101010101000': 1, '0111000011010110': 19, '1011011010
111110': 2, '1100111011010111': 4, '1110110101110101': 24, '1111010011110111': 6, '1
100111100101101': 1, '0001011101110111': 18, '1000101100001000': 73, '00111100111001
01': 5, '0001101111111100': 18, '0111010001001001': 1, '0001011010101011': 19, '0001
001000101010': 1, '0111100010101000': 13, '0011111100111101': 5, '0101011000010111':
26, '0011000011011000': 2, '1000010101010111': 2, '0001101010001100': 2, '1110100101
011101': 4, '0011010101100111': 4, '1001000001001010': 1, '1010100000101100': 13, '0
101001000000010': 17, '1101001010001010': 1, '0001110100110001': 1, '011100110110001
0': 2, '0001111101100001': 6, '0111101111001000': 2, '1011100111111100': 1, '0111000
100110111': 3, '0001001100011010': 7, '0011111100000001': 9, '1100101100101100': 4,
'0001101001011100': 1, '1011100010001000': 6, '1010101110011101': 5, '11110010010000
10': 2, '1000000100000010': 1, '1110010001110101': 8, '0001011111101101': 1, '001110
0000010101': 1, '0011101111111100': 6, '0100101101011100': 37, '0011000111011101':
3, '0111010111010111': 82, '1000100011101000': 7, '0111010011000110': 1, '0101010011
110111': 26, '1110110011010111': 5, '0111001101001010': 1, '1010100001001001': 5, '1
011000010110110': 9, '1110001001110010': 4, '0011100011100000': 3, '0011011001010111
1': 4, '1011111100011101': 2, '1000111000101000': 3, '1001011110000111': 1, '0101111
111010110': 1, '0110010011101011': 1, '0101000110100010': 2, '0010001101011010': 1,
'1011010010110111': 14, '1011010011111100': 1, '1110100011110110': 21, '110011101111
0101': 1, '1010101111111000': 1, '0101101011111100': 4, '1111010011010101': 3, '1100
111101010111': 12, '0001001000000010': 10, '1110000001011100': 13, '001011110110100
1': 1, '0110101001011100': 3, '1100111110001000': 6, '1001111111111101': 9, '1010000
111001000': 19, '1010010001111001': 3, '1011000011011110': 2, '0001111011110011': 1,
'0011110101001000': 8, '0101111100011100': 1, '1011000101011010': 3, '11100101011011
01': 2, '1100011101000010': 4, '0110010111010011': 4, '1010000011110110': 10, '10110
00001100010': 10, '1010011011010111': 1, '0101111100101001': 7, '1000001110010110':
11, '0101110110010110': 1, '0011100111010110': 4, '0001000010100110': 1, '1010100111
011000': 8, '0111100110011110': 2, '0001111000001000': 6, '1111101110000010': 1, '11
10010111100111': 7, '0001101111101101': 1, '1010100100001000': 108, '000110101111100
0': 22, '0011110001100011': 1, '0011000101110110': 1, '1001001001110011': 1, '000101
1011111101': 25, '1110000011001110': 6, '0110010010110011': 3, '1010010000010111':
2, '1110111000000001': 1, '1000000011111110': 8, '1110010110010011': 14, '1010110111
001101': 10, '1110011001101001': 4, '0110010111110011': 3, '1001001111010110': 8, '1
100011100100010': 2, '0011101001101000': 18, '1001011100000011': 2, '110011000111000
1': 8, '1110011110011110': 1, '0101101101101010': 1, '0101011101010001': 1, '0101111
000101001': 9, '1011100000100001': 1, '0001111000100101': 3, '1100011101011100': 8,
'0001010010110011': 3, '1110000001111000': 1, '0001011000101001': 20, '1010001011011
110': 8, '1000101110111000': 8, '0111010101010010': 1, '1110110101110111': 9, '00110
10010110110': 7, '1100011111001011': 8, '1000111000111001': 1, '0011010100111101':
3, '0011001110111110': 11, '1110000101101000': 7, '0011000011011101': 1, '0100111101
101001': 3, '0001100010101110': 1, '0101001110010010': 3, '1100010110110111': 7, '11
10010111111111': 1, '1100001101100010': 14, '1110110100010111': 14, '101001010000101
0': 12, '1000000111010110': 3, '0101010100010111': 18, '1110110101000101': 1, '00010
01100010100': 1, '1100001111100010': 23, '1110101011011110': 2, '1000100001111001':
2, '1010010011111101': 5, '0011110000000111': 1, '1100101000101100': 4, '00011111100
10111': 18, '0011010110011111': 3, '1110010110111101': 1, '1010010100001011': 5, '11
10010101001001': 15, '0101101000000001': 6, '1100101100111010': 2, '011001101001110
1': 1, '1100001100010111': 20, '1000111111100011': 2, '0000001100101010': 4, '001101
0001001010': 2, '0101001110011100': 2, '1101100011110110': 1, '1100101001111001': 2,
'0011000110010011': 1, '0111101100010100': 3, '1100000100001000': 1, '01100000011101
11': 2, '0011101100001100': 13, '1101110010100011': 1, '1101111011100101': 4, '11001
00010010101': 2, '0011000110000011': 16, '1011110010110111': 2, '0001000111111101':
1, '0110010111010111': 28, '0110001101000010': 1, '1000001100001000': 6, '1010110000

101010': 1, '0001001011111000': 3, '0101111100010101': 38, '1000101111101000': 40, '1100111110101000': 1, '1110001101001000': 2, '1100010001100011': 2, '00011010101101 10': 12, '0100101011100000': 1, '1110000111100010': 31, '0100101101010010': 1, '1110 111001000001': 5, '1010010101111101': 1, '0110010011110011': 3, '0010001101000010': 1, '0011110000100101': 5, '1001111110100011': 1, '0000101101001100': 2, '01011010001 01100': 1, '0001111010111110': 2, '1100100011110110': 6, '1010100000111100': 6, '111 0100000100000': 2, '0100100011110111': 4, '1110100010100000': 4, '1100110001000011': 7, '0100010110010111': 2, '1101110011011101': 1, '0011000110011111': 3, '00101100010 11100': 3, '1000011000010111': 3, '1100111001101000': 7, '1000001111100010': 1, '110 0111110010110': 1, '0101100010100010': 1, '0110101001101111': 44, '1011100100101100 0': 2, '1110011000101010': 1, '1000111010001101': 2, '0011101110111110': 2, '1011100 101001100': 2, '1000101010101010': 1, '0101110100110101': 4, '0110100110011100': 1, '0011101000011000': 6, '0000111101011101': 3, '1000010000101010': 1, '00011100111010 00': 2, '1100001011110010': 4, '0001101110101010': 3, '1010110001100001': 20, '00010 11100101001': 2, '1100101010110110': 14, '0101011101010111': 52, '1000010010010111': 3, '1011000010011110': 10, '0101110101010001': 1, '0101001010010111': 5, '0000001101 001000': 2, '0011100100001001': 14, '1011010111101101': 1, '1100000011100010': 10, '0000110001001001': 1, '0111110110010110': 5, '0111110010111101': 4, '11010110001101 11': 13, '0110110000001001': 4, '1101101100111100': 1, '0001111011101000': 6, '01100 01101011100': 1, '1110101011000010': 1, '0110000101101000': 1, '1000111011011101': 6, '0001001010100011': 21, '1010011011101011': 1, '0001011000111101': 3, '1110011010 110011': 3, '1010011100101010': 1, '0001001110000111': 1, '0011000011101010': 2, '11 00010110010111': 15, '1110000011111010': 4, '1110011111100011': 15, '010111100000100 1': 3, '0111100100001100': 4, '0111110100010001': 17, '0100001101001000': 3, '001110 0100011010': 1, '1110000100001000': 3, '1001111000101001': 32, '0111100110001110': 1, '1110011001110101': 1, '1100100101111100': 6, '1100011011010110': 8, '01111000001 01100': 2, '0011000010110111': 11, '0011010111111011': 1, '1011011100001001': 1, '10 10010010110101': 1, '0001101100110100': 1, '0010101010101000': 4, '001110100000110 0': 3, '0111110001100011': 2, '0000010101010111': 1, '1110001111000110': 2, '0011110 110101010': 1, '0111101011101000': 1, '1100001111001000': 9, '0101001010000010': 21, '0110000001111100': 6, '1000100011101011': 1, '1011110101101001': 7, '11101100111101 11': 22, '0101010011111101': 1, '0001010101000111': 2, '1001101001101010': 3, '11001 11111011101': 15, '0101110100110001': 4, '1000101010101110': 2, '0101010100110111': 5, '0001101110100010': 1, '1100001011111010': 4, '1100101010011100': 13, '0000010011 000011': 1, '0000011100001010': 2, '0011101100011001': 1, '0101000010000010': 3, '00 01001000100010': 18, '1100011011111101': 4, '0010100001001100': 2, '100011000001011 1': 1, '1011010110100011': 15, '0011000100011000': 2, '1110010100100111': 14, '10001 11001011001': 8, '1110010001111010': 1, '0010100001101100': 2, '1111110101001001': 2, '0001010010000011': 11, '0100000100001010': 1, '0000111001101001': 12, '110101010 1010111': 1, '1100010000100011': 18, '0000111101001101': 1, '1100111010010111': 5, '0001100011101000': 8, '1110011110010111': 4, '1110110001111001': 18, '0111100110100 110': 2, '0111100111111100': 1, '0001000010000110': 1, '0011010110110111': 39, '0110 000000101010': 11, '0000111000001001': 3, '1000101100011100': 7, '1101111000101001': 2, '1110010011001101': 1, '0001000110011010': 3, '0011010010111111': 11, '1100011111 000010': 5, '1001011101000011': 4, '1000111111111110': 1, '0011011000110111': 8, '11 00111001111101': 27, '1000011000101010': 9, '0001000010110110': 15, '001100100111101 0': 4, '1100101010010100': 1, '0001110101000001': 2, '0111011000100011': 1, '1101001 111110111': 1, '1000101011111000': 1, '0010000011011110': 6, '1110000111011010': 4, '0000101010001000': 4, '1110000000100111': 2, '1111111000000001': 1, '001101010010 1000': 2, '1000111010101000': 3, '0001010110010111': 24, '0000111011001000': 1, '01101 10010110101': 21, '1111010110110111': 5, '0011101110100110': 1, '1101001010100011': 6, '0011010010011101': 2, '0100101000101001': 1, '1011110100011100': 5, '01011000001 10100': 5, '1000110110111101': 3, '1100010101010101': 2, '1110000110110110': 37, '11 00100001010100': 1, '1100111101000011': 1, '0010101101001000': 5, '100111110001011 0 1': 1, '1000011000110111': 6, '1001000011110110': 2, '0101001010011110': 5, '1110011 101000001': 2, '0001111100001000': 16, '1101101111100000': 1, '1111100100000010': 1,

'0000101001111100': 32, '1100101101010001': 1, '0101111010101101': 1, '0011001110101
000': 1, '0100011000101001': 1, '1010110100010101': 1, '1110110110011000': 1, '11001
01001000000': 3, '1110111001100001': 25, '1101101110110110': 2, '1111100000011100':
1, '1100000101000010': 6, '1010110011111101': 15, '1001111010001101': 4, '0000000100
001010': 2, '0001111100100010': 1, '1110110010000101': 7, '1010101000101001': 1, '01
11111111111101': 4, '1010010011101110': 3, '0101001111010111': 5, '100011110111110
0': 5, '1110111010100101': 2, '1010010111011011': 1, '1101011110000011': 32, '011001
0000110011': 1, '1011001001101010': 4, '0001100001000000': 1, '1111110110000101': 2,
'1001101110101000': 10, '1100101100001010': 19, '0011011010111111': 2, '000111111000
0010': 4, '0101100000001000': 1, '1000001101001000': 17, '0101001010101000': 1, '001
0000110001010': 1, '0001100110101000': 4, '1110100000101100': 22, '110101111101010
1': 3, '1010010001001001': 12, '0011010001100001': 1, '0101111010001000': 1, '000010
0000001000': 1, '1110111001110101': 2, '1000001001011100': 17, '0001100100000000':
1, '1100101001010100': 6, '0011010110000111': 9, '0011100000010100': 1, '10001000001
11100': 1, '1011010100001001': 1, '1110010011101011': 7, '1100000101011000': 2, '000
1011001101101': 1, '1110000110010010': 1, '0011110011110011': 2, '0100111000000001':
2, '1110010001101101': 2, '0100101111101110': 1, '0100111110010101': 30, '0101011100
100010': 1, '0010001111011110': 4, '1100011101011001': 1, '1011011010100011': 3, '01
01101011110100': 1, '0011010101100010': 5, '1000000111001000': 1, '101111110111110
1': 2, '1100000110010110': 12, '1100100110110110': 1, '0110010100000011': 3, '101001
1110001101': 1, '1100101101000001': 10, '0001001100110111': 3, '0011110001001000':
1, '0101110000010101': 5, '0111100111100101': 2, '0101011000100101': 1, '00110100000
10111': 21, '0101010111110101': 1, '1010101110001000': 16, '1110000110001110': 3, '0
111011101000111': 1, '1110110000001001': 22, '0110101101001000': 3, '110010110001010
0': 2, '0010100110101000': 3, '0101000110000110': 4, '0111100100000000': 1, '1000101
110010101': 1, '0110010110110111': 3, '0001110011111101': 20, '1010111101101001': 1
0, '0110100011100011': 1, '1011000101001001': 1, '1110010111001110': 1, '00110100111
00111': 2, '1001011100001001': 1, '1110000000011010': 5, '1110111010110101': 15, '01
11010110110011': 5, '0101000111010110': 12, '0001111110101011': 2, '100111110100100
1': 13, '1110111100001001': 7, '0001010101000010': 2, '0011010101001111': 2, '111001
0111011101': 1, '0111001001100010': 9, '1100111111010111': 13, '0110100110010100':
1, '1011010010111010': 1, '0101001001100011': 3, '0010100001111100': 32, '1000010100
001010': 2, '1001111000111100': 4, '1011110000111101': 11, '0110100001011000': 1, '0
111000011010111': 2, '1010110010111000': 3, '1010110101100001': 7, '000101101101010
1': 4, '0100011111010011': 3, '1101111101010101': 1, '1000011000000010': 1, '1100111
000010111': 4, '1111010000110111': 14, '1011100011001000': 4, '0001001110101110': 9,
'1011100001001000': 2, '0110000101001000': 2, '0001101100000010': 6, '11001101010110
01': 2, '0001001000110111': 16, '0110100101001000': 13, '0101111010100101': 2, '0110
101011101000': 1, '1000101101011010': 2, '1011010110011111': 1, '1001101010001000':
5, '0000000111011110': 1, '0101010011010101': 3, '0000011001110111': 3, '01000011111
11110': 4, '0110000100100010': 7, '1100111111100011': 17, '1110001100000011': 2, '01
01100110001010': 1, '1100101011011100': 2, '0001011110101101': 1, '010110110100001
0': 13, '1010100101101100': 5, '0001101000101001': 15, '1100110001101001': 10, '0101
111111110110': 1, '0011010010110011': 13, '0001101110111110': 17, '011110100001011
1': 1, '1100001101110111': 6, '0011100111011101': 17, '1010110111111101': 5, '010110
1010100010': 7, '1000101010111101': 14, '0010011101001000': 1, '0111110101010111':
9, '1101001010110110': 19, '1000010001101000': 1, '1100110111100111': 1, '0001001111
110011': 1, '0010101000101000': 1, '0110000111010110': 29, '1100110111110111': 3, '1
100000000101010': 8, '0100111111100011': 3, '0010100111001000': 20, '010111111100010
1': 12, '1110110110000001': 1, '1100100110010101': 4, '0100101011000010': 1, '000100
1110100010': 12, '1011000011101000': 2, '0011000100001100': 4, '0101011001100111': 2
0, '0001101110111100': 2, '0001011011011110': 1, '1100101010011000': 4, '00100100011
11101': 1, '1110010101011111': 1, '0111000000111100': 2, '1110101111010110': 1, '011
0110010010101': 6, '0101110000100001': 33, '0111011001100011': 4, '011111101011000
1': 4, '1000001100011010': 14, '1101011010000011': 11, '0101110001000001': 3, '01010
01010100011': 18, '1000101111011101': 1, '1100111011100101': 10, '1110000111100111':

1, '1010101111101000': 10, '1001110111110101': 2, '0101101000100100': 1, '1010100101
011101': 3, '0001111010101101': 25, '0011010000101001': 19, '0111001110111110': 2,
'0001011100000001': 10, '1000011000100111': 5, '1100010101000111': 3, '0001010011100
011': 2, '0101101001001010': 1, '0000101100101010': 2, '0011111010101000': 2, '10011
10000100001': 2, '0011100100010001': 1, '0100110110010101': 9, '1110000011000011': 1
3, '0101111100010001': 15, '1011101111101000': 2, '0110001100100010': 2, '0011111000
111101': 9, '0111000110010010': 2, '0101010111000011': 1, '1011000011010110': 1, '10
11100110111110': 2, '0001001001010111': 1, '0110010001000011': 1, '001001001100101
1': 1, '1110110001111000': 1, '0011111100010101': 1, '1100101010111100': 24, '110011
1001001101': 1, '1100011001101001': 13, '1000101110101000': 10, '0011000000100010':
19, '1000011010101000': 1, '1011000100111100': 3, '0100011000000011': 2, '1001111000
110001': 2, '0101011001000011': 10, '1010000010001110': 1, '1000010100000011': 1, '1
001111100011101': 9, '1110111101011101': 6, '1000101100101001': 3, '000010101011110
1': 2, '1011110100101001': 6, '0010010000001001': 1, '0011001001100010': 3, '0100000
000101010': 4, '1011001101101010': 2, '1110000101100010': 14, '1001100000000010': 1,
'1111000101000010': 12, '0001001000010111': 3, '0011111010011101': 6, '0011100000110
111': 1, '1111010110010111': 15, '0101101110011110': 5, '0001110001101001': 3, '1011
010111011101': 4, '0001010011010101': 1, '1110110001110111': 15, '1010110000101000':
3, '0011100110100010': 1, '1110010101100001': 17, '0011001001101000': 1, '1010101001
101001': 3, '0101011111110011': 3, '1010101110011100': 9, '1001011101100011': 1, '00
01111110100011': 18, '0100100101001000': 1, '1100011110011101': 8, '0011011100101000
1': 3, '1100001011110111': 19, '1101001101100010': 5, '0011100100000011': 1, '111000
1001111100': 7, '0000001101000010': 1, '1010000010111100': 1, '1110000111001010': 2
8, '1100011110010011': 8, '1111100100000001': 1, '1010100011001100': 1, '00101000111
01000': 12, '1000001111101010': 15, '1100001001001010': 1, '1011000011110110': 4, '1
110010101001000': 1, '0101101000000000': 3, '1100110010010111': 2, '000111110100011
1': 1, '1011010010010111': 4, '0100011100100011': 2, '0101010010010110': 1, '0001011
001001010': 2, '0100111110111000': 1, '0011110000011001': 9, '0111101011110110': 1,
'0011100110001101': 1, '0100001001111100': 4, '0001000111010110': 8, '001011000110110
00': 1, '1100101001100001': 23, '0100100000100010': 1, '0110110000000001': 1, '10000
11111000010': 1, '0011000111101000': 5, '1110010010111111': 1, '0011000001000010': 3
5, '1000111001101101': 4, '1010000110011000': 1, '0100111101000011': 1, '01010111100
10110': 13, '1100110000000001': 2, '1100111010101101': 10, '1110010001110001': 4, '1
001101010110111': 2, '1000011000100010': 1, '1100111001110111': 11, '111101000101011
1': 3, '0000111001111101': 2, '1110110011010110': 1, '1010000101101000': 8, '0110100
011111101': 1, '1110111001111100': 2, '1110000011101000': 13, '0011010110010011': 1
1, '0110100001111000': 2, '1111110110000011': 4, '1011100101101000': 6, '10001011101
11101': 4, '1110110100000111': 5, '0011100110101100': 4, '1101001010000010': 3, '111
0101000111100': 2, '0001100000011101': 1, '1101111011110101': 11, '010001110111011
1': 6, '0011010110011011': 2, '0011001111011100': 2, '1000110101000001': 4, '1011010
111010110': 1, '0101101110010111': 3, '0001000011110110': 7, '0001111101010001': 3,
'0110100010111100': 1, '1000111111011110': 1, '0110000101111100': 1, '11000010001010
00': 6, '1001111110001101': 6, '0011010001101001': 14, '1011110110100011': 4, '00011
01110001100': 4, '1101101011110101': 2, '0100011111001011': 3, '0111000101000011':
2, '0001110001100001': 1, '1000011011101011': 9, '0101001011110111': 8, '01010111011
00001': 2, '0001101101000001': 2, '0111000001100111': 2, '0001011110101000': 1, '010
0111001110111': 2, '0100101011001000': 6, '1010100001100100': 1, '1010010100101010':
5, '1010100000011000': 1, '0110000010111110': 4, '1100110000000111': 2, '00011100110
10101': 4, '1110100101001100': 23, '1101010011110111': 6, '0111101101001010': 1, '11
10100000101100': 17, '0111100001110100': 1, '0001001000010010': 2, '100001100100000
1': 2, '0001000111001000': 3, '0111110010110011': 5, '1110000111000011': 30, '101010
1111001000': 26, '0101001000110111': 7, '0111000111101000': 2, '0100011000010011':
1, '1101010111010111': 1, '1010101110001100': 1, '1000100000100010': 1, '10110001101
11110': 11, '1011010000111001': 1, '1001010110010111': 3, '1110110111110111': 6, '00
00111101110111': 1, '1110100010111100': 21, '1100111000100010': 4, '111001010101010
1': 11, '0101011110100111': 15, '1101111001001001': 1, '0011000101010010': 2, '01110

101100011111': 1, '1110011010011101': 1, '0111010001110001': 1, '1010000010011110': 3, '1011010010000011': 4, '1000011101110111': 5, '1100010001010111': 14, '0011011110 000011': 13, '0011110111100011': 1, '1010100111101000': 32, '0011100010001101': 1, '1110010001111101': 9, '1000100000101000': 5, '0000101011111110': 3, '11001111110100 11': 2, '1110010001110011': 7, '1000111100100001': 1, '0101101000001000': 5, '000010 1101101000': 8, '0101111110000111': 4, '0110110011101000': 1, '1010111001011100': 1, '1100111111110111': 7, '1110100110110110': 6, '0011011101110111': 2, '01110001101000 11': 9, '0101001111000010': 1, '0110100101011100': 25, '1110110111100011': 13, '0101 110111000101': 3, '0001101101000010': 8, '1001011110011110': 3, '0001100011001000': 4, '0001000010011110': 9, '1110011111110111': 4, '0001011101010010': 1, '10101001001 01001': 3, '1110010001010101': 1, '0101001110100110': 6, '0100111100100101': 1, '100 1111010100011': 5, '0111110000111001': 2, '1100111001001001': 24, '110001100110110 1': 1, '0111000001001000': 1, '1110000100100011': 4, '1001000101001010': 1, '1110110 101110001': 7, '1110100101110100': 4, '1010100111111100': 3, '0001111000101100': 5, '1010000101001010': 2, '1101001010000011': 1, '1100100010110110': 2, '01110000101101 11': 12, '0001011010110011': 25, '0010010011101010': 1, '1100011110010110': 7, '0010 110101000001': 1, '1010000000100010': 13, '1100001001100001': 4, '1111100111110101': 1, '1000101011011110': 7, '1000110101011100': 3, '0101101001000010': 5, '10011110101 01010': 1, '0100111101110101': 3, '0101101001001000': 4, '0011000100111100': 12, '00 11011100010111': 8, '0101100111010000': 1, '0001010111110101': 1, '000111100000000 1': 36, '1011110100110101': 1, '1000001000111010': 6, '1001001010101010': 6, '110001 1010010011': 17, '1110001011010110': 5, '1111111110010111': 1, '0001111000011100': 1 7, '0100001001100010': 6, '0111010000000111': 2, '0110110101010011': 1, '00001010100 11100': 1, '0111000111110101': 1, '1100110001001001': 3, '0100111110110101': 5, '111 0000111010111': 12, '1110110000101010': 4, '0111100100010100': 11, '010111110101000 1': 3, '1100010111010111': 37, '1000101000101100': 13, '1010010111010111': 19, '1010 010100000111': 1, '1100101101110100': 4, '1110000101001001': 3, '1111010110100011': 12, '0001001111010111': 5, '0011011010010111': 1, '0010000100100010': 2, '0110111110 011101': 1, '1100001000111010': 9, '1100101101010111': 3, '1110010000110011': 8, '10 00111101100001': 4, '0011001100000010': 3, '1010110110110101': 5, '011001100101011 1': 1, '0001110100100001': 13, '0011010000111111': 2, '1010010011110111': 12, '01011 11011110110': 1, '0011110000001101': 2, '0001001111001000': 19, '0011110011010111': 1, '0001111111000101': 10, '0010100000101010': 4, '1011100011101000': 16, '110010110 1001100': 17, '1111100001100000': 1, '1110110111010111': 10, '0001001000011000': 1, '0111111100001001': 2, '0011100000001100': 11, '1100110101001001': 8, '1101000010100 011': 1, '1001010101110111': 1, '0101110111110101': 8, '0011110000001000': 9, '00000 01101010111': 1, '0100111010010011': 1, '1100011101000011': 16, '0011100100110100': 2, '0100101101001100': 2, '0111010100100111': 1, '1101011101000011': 3, '00101001010 11000': 2, '0100011111110101': 1, '0011111010100111': 1, '0110001111011110': 3, '110 0110001111001': 5, '0010000000100010': 4, '1010000111110110': 7, '0001011110111011': 1, '1010010000111111': 4, '1001001010110111': 1, '0101111001110001': 3, '01111101011 01001': 3, '0001111011010011': 1, '1110000111100110': 12, '1010000111101011': 1, '10 01001000110111': 2, '0100111000001001': 1, '1110001101100010': 2, '110011111100001 0': 1, '1010010011011011': 1, '0101100000110111': 1, '1000001101110111': 1, '1010011 101111101': 1, '1101111110000011': 5, '1100111001000101': 4, '1101001110010110': 24, '0010000011110110': 1, '1110111110101101': 1, '0001001110011010': 10, '1100011001110 001': 4, '0111100001001000': 1, '0101101100000000': 5, '1100001011000110': 19, '1010 101000111100': 2, '0110010010010101': 2, '1000111100101101': 2, '1110010001111111': 1, '1000000100001010': 13, '1100101010001100': 2, '1010111101101000': 1, '1110010010 010101': 6, '1100001011000011': 8, '0011001010011010': 1, '1000111101010111': 2, '10 00010011101010': 1, '1110000010110011': 1, '0101010110010111': 17, '101011011001110 0': 3, '0101101010111100': 1, '0100001111000000': 1, '1100111101110001': 20, '010011 0111010011': 1, '1101011000010001': 1, '0101000100110111': 1, '0001111100101100': 1, '0111010001001010': 2, '0011100010101010': 4, '1000001011001000': 2, '11000110000010 01': 2, '0011011010110111': 5, '1100101010100101': 3, '0101001000111100': 4, '011110 0001101000': 5, '0011110010110011': 5, '1110000101010010': 28, '0001111110001101': 2

2, '0001011111110011': 4, '0000011011111110': 3, '0001101110011010': 1, '00111110111 01000': 1, '1000110001111001': 3, '0001001111011101': 1, '0001111110001000': 12, '10 00010000001010': 3, '1110010101110011': 2, '1111110011010101': 6, '1010101100101100 0': 2, '1000101000111000': 1, '1011000010101010': 9, '0011001100011010': 1, '0011010 110111011': 1, '0010100001111000': 5, '1111010001001010': 1, '0100101011111000': 1, '0011001000001000': 1, '1011110011001101': 1, '1100110000110111': 3, '01010110111000 10': 1, '0011110110110111': 4, '0011011111110111': 3, '0000111001100001': 4, '000100 0100011010': 3, '1010100011111111': 6, '0101000110010010': 2, '0011000001101100': 3, '0011011100110111': 1, '1110010010010110': 1, '0110010010010011': 1, '00101000100111 00': 1, '1110101101010000': 1, '0011110011111100': 7, '0111001010100110': 2, '111101 1110000111': 1, '0111111111111100': 1, '1110110011001000': 1, '1000011010111110': 3, '1100111101111001': 10, '1111110010100101': 1, '1000101110011101': 8, '1010010010111 101': 9, '0011010111110011': 2, '1000101100001100': 22, '1000111001010111': 1, '0101 101001100001': 1, '0011010111110111': 13, '1110010100101001': 1, '0100101101000010': 1, '1010101010111000': 6, '0010000000011010': 1, '1001001100010111': 2, '10010010001 11000': 2, '0011110000101000': 18, '1110001100000010': 18, '1100111111100010': 1, '0 011101010101010': 2, '0001011001000111': 4, '0001101100100001': 1, '011111011011010 1': 1, '0000111111111101': 2, '0011010010111011': 2, '0100100101011100': 4, '1100011 111000110': 1, '1110000100101010': 35, '1100001100110010': 6, '0001100010110110': 1, '1001110011110101': 1, '1111010111010110': 1, '1000101100101010': 9, '10010110100001 11': 1, '1010101011001000': 9, '0110010011110111': 22, '1100111100100001': 14, '0001 111011000101': 2, '0011010100001001': 11, '1010010101100001': 1, '1110111111011101': 4, '1000101011001100': 1, '0101110100010111': 1, '1000101101001001': 9, '01001000110 10110': 1, '0011010101011111': 2, '1000111011111111': 2, '0100011111110110': 1, '110 0010100000111': 4, '0100001110010110': 13, '0101011100100001': 7, '011110000001010 1': 1, '0011000111011100': 8, '0110000111000011': 6, '1000011111001011': 9, '1100001 111110111': 6, '0001110000000001': 14, '0001011000100010': 1, '0000111011111101': 2, '1011110011101101': 1, '0011110000010111': 4, '0001101100010000': 1, '01110000001100 10': 5, '1100011011001000': 1, '1110001111101010': 2, '0010100111111100': 2, '000010 1110001000': 6, '1010110111101000': 3, '1110000001101100': 3, '0101011000100001': 1 1, '0001110000111101': 7, '0000001000001010': 7, '1111010010010111': 6, '10101100000 01001': 40, '0001001011111110': 28, '0101111010110110': 1, '1100001000100111': 3, '1 001001011110101': 1, '0001111111010111': 4, '0110110110011101': 10, '0001111101110101 1': 2, '1010100010110101': 2, '0000111000101001': 11, '1100011011101101': 2, '111011 0110001101': 3, '0001101000000000': 1, '0101101101001100': 1, '0001010001100001': 1, '1110011011101011': 2, '0010101011101010': 2, '0011000100010010': 5, '11101100000000 11': 6, '1110110100110111': 5, '0100001100100010': 5, '0101011101000111': 20, '11001 01011100000': 1, '1000001011001110': 4, '1110111101100001': 6, '0001010001100111': 2, '1010000010101000': 6, '0101101100010010': 2, '0111111100100001': 10, '0111001001 000010': 3, '1010000110111110': 4, '0101000010100010': 10, '0011010011110011': 10, '0101011111010110': 9, '0000001111001000': 2, '0101011011010011': 3, '00011110100101 11': 3, '0011001110011101': 2, '0101110111011101': 1, '0000101010101000': 5, '001101 0111010101': 15, '1110010101000111': 5, '1000111001110101': 5, '0111101010111100': 1, '0111110010101000': 2, '1101101100100001': 1, '0011011000010111': 1, '01010110011 10011': 4, '0010000111111110': 6, '0111010001010010': 1, '0100011101010111': 18, '11 10010101110001': 1, '0101001111011110': 1, '1000011111001010': 2, '000100101110111 0': 2, '0001010100001001': 2, '1110110010110111': 14, '0111100011110101': 11, '00110 11001100011': 2, '0101110001110111': 1, '1011000010010110': 4, '1110000001001000': 4, '0101011101000001': 1, '0000001111001010': 6, '0011000111010011': 1, '11001010010 01100': 8, '1010000111001100': 1, '1100000101100010': 3, '0111100000100000': 4, '010 1101101101000': 2, '0001101100000001': 7, '0011010110100111': 3, '0001010111010110': 2, '1110110001101000': 9, '0010110001101001': 16, '0101010110000111': 7, '1100001010 101010': 6, '1110100011100011': 1, '1111110000111100': 1, '0101101110110101': 1, '10 1110001011010110': 1, '1101010101100011': 1, '1100101100101001': 2, '011000001101001 0': 1, '1110001110010110': 4, '1110000000111111': 1, '0011100011100101': 1, '1110001 001110111': 1, '0010100110011100': 4, '0001001011111100': 11, '1100010011100010': 3,

'1100110011100101': 2, '0011010100001000': 1, '1000111011001000': 2, '10110101100101
11': 4, '0001110010101000': 3, '1100100010011100': 1, '0011000110001110': 28, '01011
11010011101': 2, '1001001010110110': 10, '0011110001001100': 1, '0010000100011010':
3, '1110001011110110': 16, '1011110011011101': 11, '1011110111010011': 1, '101110010
0011000': 4, '1100101101100101': 1, '0001101011110110': 5, '1110100010100101': 2, '1
010101000101010': 4, '1001101000101001': 2, '0010111010011101': 3, '111011000101010
0': 1, '1101000111010110': 7, '1100111100000111': 5, '0001111100011001': 26, '111001
0100100011': 23, '0101000110110111': 1, '0111100111100000': 2, '0111010111110101':
5, '1111001111010110': 2, '0011110100101000': 9, '0110001101111100': 1, '00111110011
00001': 2, '0001001110001110': 34, '0011000000110010': 7, '1010101101101001': 1, '00
01000010100011': 6, '1011100000001001': 1, '0110010010011110': 1, '110001101100011
1': 23, '0001110100010001': 3, '1100101101101000': 20, '1100001101010111': 17, '1001
000101101010': 1, '1011001100011100': 1, '0110100101010101': 1, '0100001100001010':
8, '0110000111100110': 1, '1111110000101001': 8, '0000100001011100': 2, '11001111011
11101': 12, '0001101100011101': 6, '1110011010110101': 2, '0100010100000011': 1, '11
00111000110111': 22, '1111010000010111': 4, '0010000111001000': 5, '010010110101011
1': 1, '0101111101101001': 2, '0110010011110110': 2, '0001011100110011': 1, '1110011
111010110': 2, '0101111100110111': 5, '0011001011110110': 5, '1100001101000001': 4,
'0101101100101000': 3, '0101010111010101': 4, '0101111110100111': 1, '00110010100001
10': 1, '1101010001000111': 1, '0111110000110111': 10, '0001001000110010': 7, '01101
00001110101': 2, '0000000111101110': 1, '1100010001100010': 2, '1000000011101010':
1, '1100111001010001': 9, '1100101110110101': 8, '0011100100011001': 5, '11100100011
00111': 12, '1001101000101000': 14, '0011000101001000': 15, '1010011111001011': 2,
'0101100110110110': 2, '1000001011110110': 8, '0011111100011101': 15, '0011010110111
101': 3, '0011111111001101': 6, '1001101110011000': 1, '0011001110001000': 6, '00010
11111111111': 1, '1011000110000011': 1, '1000010010110101': 1, '1110001101001100':
2, '1000000001101000': 4, '1110000011010010': 2, '1010110101011001': 17, '0011001101
101010': 12, '1100111001111111': 1, '0101001101000111': 1, '0001001010000110': 7, '1
100100001000001': 1, '1111100000100001': 2, '1001011000010111': 4, '011010010000001
0': 2, '1010000001011010': 3, '1100101011011110': 7, '0001011110101011': 1, '1110100
110111101': 3, '1001000110000011': 1, '0101111100110101': 11, '1001100000111100': 7,
'1111000111110110': 3, '0111100001001010': 1, '1011111001101001': 6, '01000101010101
11': 4, '0101011100010101': 5, '1011000010111010': 2, '1110101010110101': 2, '010010
1101011101': 1, '1111000110000110': 3, '0111110000010001': 4, '1110001111110110': 4,
'0001101100101001': 6, '0101100110010110': 5, '0110100110001000': 4, '00111000101111
01': 5, '0011011110110111': 2, '1110100100000001': 1, '0111010100100001': 2, '011000
0111000110': 4, '0011001101000010': 5, '0011010100011001': 3, '0110010011111111': 1,
'1110100111101100': 1, '1000101011111110': 14, '1010011000100111': 1, '0001001100111
100': 13, '1100000101111100': 1, '1000011011000011': 11, '1000111001101100': 2, '001
0011100011111': 1, '1001110001110101': 1, '0001011010001010': 3, '1010111011111101':
1, '1110100111001110': 5, '0110100101001010': 1, '0101111100011101': 4, '00111000010
01100': 5, '1010111110011101': 19, '1001100000110100': 1, '1000111000101101': 2, '00
01111010110110': 3, '1100100011111110': 1, '1100110101100001': 23, '101011011001100
0': 2, '0001100011110101': 5, '1010110011101100': 1, '1100101101010100': 9, '0001111
001101000': 3, '1010100110111000': 6, '1011100100010100': 2, '1100101101101001': 4,
'0111010011110101': 17, '0111000010111110': 10, '1101010000110111': 2, '100011111000
1101': 8, '1100001110110111': 3, '0101010100011100': 1, '0001011010101101': 2, '0001
100101001000': 7, '1000001111011010': 2, '0011001110010110': 6, '0110000111110010':
1, '1000111010010101': 5, '0101100001100010': 3, '1000001100100010': 2, '01111100111
10011': 1, '1110000011110010': 5, '1010110011101000': 9, '0011110101010101': 1, '000
0110100001001': 1, '0100111001000001': 16, '0011000010110010': 3, '010011100111010
1': 6, '1101101111110101': 2, '1000101000011010': 2, '1111000100000010': 4, '1100000
100001010': 6, '0111100000110001': 1, '1101111010100011': 3, '1110010101101001': 1,
'0101010101000011': 9, '0001011010110110': 5, '0111000010110010': 2, '11100010001101
11': 1, '1001100001001000': 1, '0010010111011101': 1, '1110010010110101': 20, '00010
00110000110': 3, '0011101010101100': 1, '0001110000011101': 2, '0111111111010101': 1

2, '0001101110011101': 2, '1100011111110011': 16, '0110110101000001': 17, '110011110
1011100': 14, '1010001011101110': 5, '0001100001101000': 4, '0011010110001010': 4,
'1000011011111101': 2, '0011111101000011': 1, '0000001111101010': 3, '10110001111100
11': 1, '1001101011110110': 1, '1100110111000101': 2, '0011010110110011': 2, '101100
0111010110': 4, '1111100001101010': 1, '1110110111011111': 2, '1100101101000010': 2,
'1100001001001000': 3, '0001001111111110': 5, '1000001110001010': 1, '00111101111010
00': 1, '1000001001000010': 2, '0001010100110111': 3, '0101001000010010': 8, '001100
0011011110': 11, '1111110100010001': 1, '0001111100001101': 4, '0001000010101010':
6, '1100111100001100': 2, '0110000101010111': 6, '1101111000000001': 10, '1100111011
110010': 1, '1000111011101011': 1, '0101101011111101': 1, '1110100101010001': 3, '10
010001101001000': 2, '0011110111011100': 6, '1011100010100011': 1, '010100111101001
1': 2, '1001011001110111': 4, '0011101000111000': 10, '0100011001110111': 24, '10011
00100111100': 3, '0010101101011100': 7, '1001000101000010': 3, '0011101011001000':
8, '1001011000111001': 1, '0001000101101010': 8, '1000011100000010': 2, '10111111000
01001': 3, '0100101001111000': 1, '0110000100000011': 1, '0011001010101000': 2, '010
1111000111100': 1, '0011000001111010': 25, '0010010011010111': 2, '011010000000001
0': 1, '1011001001001010': 1, '1110010101010010': 1, '0000011111000011': 3, '1011111
000111100': 2, '0001000110111110': 7, '0011100010010110': 4, '1100010000100111': 11,
'0110100111000110': 3, '0001001111001010': 4, '0001111110111101': 21, '0010010101001
001': 2, '0011100100010101': 2, '1100011111011101': 2, '1010000000110111': 1, '00001
11100001001': 4, '0111001010100010': 4, '0010100010001000': 1, '0000001111011101':
1, '0101001000011100': 2, '1101111000110101': 5, '1111101000101000': 1, '00001110011
11100': 1, '1100101010010011': 1, '1100111110011000': 2, '0101010000100001': 2, '110
1101010000010': 1, '1110110101111001': 7, '0011011110100010': 1, '0010101101011000':
2, '1010110010110101': 11, '1010010111101011': 2, '1000111100001010': 2, '1010111001
001001': 4, '0001110110010111': 3, '0001001111000110': 1, '1011100000101100': 4, '01
01111101100011': 1, '1000111010111100': 3, '1011000110001110': 4, '111011110101101
0': 1, '1011101101101000': 2, '0111110101010101': 7, '0101001010000110': 8, '0110100
001101100': 3, '0011011110101101': 1, '0001011110010110': 13, '0011010101001010': 2
2, '0101000101010010': 3, '1101111111010101': 11, '0110001111000011': 1, '0100010111
000111': 1, '0101100111100000': 1, '0010010011111110': 2, '0111110000110001': 18, '1
110010100000010': 18, '1110100000100001': 6, '0111100010010110': 13, '01111011100000
11': 2, '0110110000101001': 10, '1110001111111110': 5, '1000101111001010': 3, '01001
01101000001': 2, '1010000011100011': 4, '0111100000010001': 1, '0010110111101000':
2, '1010000000101000': 5, '0001110111100101': 3, '0101101011100000': 4, '01000011111
10010': 1, '0111000100110010': 6, '0101100100000001': 4, '1110110110010110': 1, '100
0011101011111': 2, '0011011111111101': 5, '0010011101001001': 1, '1100110001110011':
1, '0101101100101100': 1, '0011111000110101': 4, '1100001100000011': 5, '10000110100
11101': 4, '1010010011101000': 1, '0110000100101010': 3, '0111101000011100': 2, '110
0001101111100': 11, '0001010010101011': 1, '1011000001101001': 1, '110011010101011
1': 4, '1011100110001110': 1, '0011010011010011': 2, '1111010111110111': 5, '0001000
010010110': 6, '0110010101100001': 3, '1011110000000001': 6, '1111010111010111': 4,
'0101001010100110': 29, '0001011001100111': 12, '0100101110001000': 5, '010001110100
0001': 3, '0010111001101001': 2, '1110001001010010': 1, '1000110101111001': 2, '0011
010110111111': 2, '0100010000110111': 1, '0100001010110110': 8, '1110100011100010':
7, '1100011000000001': 1, '0100010100101100': 1, '0011001011001000': 1, '11111100001
10101': 5, '1110100011101110': 1, '0001000101110010': 1, '0001100001001000': 4, '110
0000111010111': 3, '0001101111001110': 1, '1010110101111100': 4, '0101001001010111':
3, '1100111101100101': 2, '1010010001111111': 1, '1011110111111101': 5, '11101101001
00001': 13, '1000101001110100': 2, '0011000000111010': 8, '1110000000101000': 6, '00
01001010101000': 15, '0101001110101010': 3, '0110001000001010': 2, '100111010001000
1': 1, '1110110010111100': 1, '0100111110001000': 1, '0111010011001011': 1, '1010111
001101000': 2, '0111001011010110': 4, '1001101001111111': 1, '1100100110010110': 5,
'1111000001000010': 1, '1100101001100010': 6, '1110101000100010': 1, '11100110000001
11': 1, '0010000100001000': 1, '0111100100100001': 7, '0011010010000111': 8, '100100
0010010110': 1, '1001101001001000': 2, '1000010011101000': 1, '1100100110110101': 1,

'1100000111000010': 12, '0010101100101001': 1, '0111100100011000': 3, '1100001000100011': 5, '0011111111001000': 2, '0001001011111010': 2, '1010101001111000': 4, '0001010110110011': 1, '0010111101001001': 3, '1010101001011000': 1, '1110001110111110': 1, '0110110011100101': 1, '1101010001010111': 2, '1100000011001110': 1, '1110101100001000': 13, '0101100010010110': 2, '1001011000101001': 4, '0011111111010101': 9, '1001001110101010': 3, '1110001011101010': 6, '0011010110111110': 3, '0001000011010110': 7, '1011110101001001': 5, '0011110000100000': 1, '1010000111101110': 2, '0001101010101010': 9, '0000011111011110': 2, '0011001110000010': 4, '1000011000001001': 5, '1111000001100010': 7, '0111000001110010': 1, '0011110000110001': 14, '0000001100001000': 2, '0101010111110011': 1, '0111010001100010': 8, '1101101100010100': 2, '1101111111110101': 7, '1100000011011000': 1, '1110000110111110': 4, '1101101000110100': 1, '0001110010110011': 1, '0101101000011000': 1, '1001101110001000': 22, '0101101010001000': 1, '1010110111001000': 11, '1100111001011001': 10, '1110100011101100': 2, '0100011110010111': 7, '0001101101001010': 25, '1010100011011100': 4, '0011100010101110': 6, '0011011101001001': 6, '0011010001111111': 8, '1000001110001000': 4, '0000101101011101': 1, '0011100010000110': 1, '1001000001101010': 2, '1101100100010010': 1, '0101010110110110': 2, '1110010110001101': 1, '0001101010101100': 4, '0010010000101011': 1, '0011000110101110': 9, '1110110001011001': 5, '1011010001111010': 1, '0110000100011010': 1, '1100001100001100': 2, '1011010010001011': 1, '0001000011111110': 1, '1110110010011100': 1, '0001011000111100': 2, '0101110000100101': 1, '1001001110000011': 1, '0111101100011100': 7, '0111110100110111': 5, '0111110110000101': 3, '0110010101101001': 1, '0011011100000010': 1, '1011110000001001': 8, '0000001000111010': 2, '0101100010100011': 1, '1100111110010111': 13, '1000001111100011': 1, '1010010000101111': 1, '0100011110110101': 3, '1110100001001001': 5, '0101011010000111': 6, '0011111100001000': 3, '0011001010001010': 6, '1101001011110110': 8, '1100110101000101': 2, '0111110111001000': 2, '0011011110001011': 1, '1000011001100011': 1, '1101101011010101': 1, '1010010001101001': 20, '1100000001111100': 3, '0101111010000101': 2, '1000101010011100': 11, '0110111111001000': 1, '1101100110110110': 1, '1000011000001010': 4, '0100111101001001': 6, '1011001000111000': 1, '0001010111010111': 5, '0101000111010111': 1, '1001001010110010': 2, '0000010010011101': 1, '1000010011110111': 2, '0111100111001000': 12, '0110100000101010': 3, '1100000011011110': 2, '0011010111001010': 1, '1011110110011101': 10, '1000010011100011': 8, '1001001010000011': 3, '1010001010111110': 1, '1110000010110101': 3, '1001101110101100': 2, '1010110100101101': 1, '1001100101100010': 1, '0110100001011100': 7, '1100011101111001': 2, '0101000001001010': 1, '1110110110110111': 5, '1110001010101110': 1, '1010010111110111': 1, '0011000101001001': 2, '1001001001100010': 8, '1010000100000010': 15, '0110000011011110': 5, '1110100001011000': 8, '1001011111100011': 1, '1110100000101001': 4, '0111011101000010': 1, '0101000000010100': 1, '1101010010110111': 3, '0111110111011101': 14, '1011000000100010': 2, '1000011111011110': 16, '1100011101011101': 4, '0110010001101001': 2, '0100101111101000': 2, '1001100101001100': 1, '1011000110110110': 8, '1000100000101010': 3, '0010110100001001': 5, '1100000011000010': 3, '1110010010011011': 1, '0011001010010110': 2, '1010110110010111': 2, '0001101110001110': 4, '1100001010110011': 1, '1011000011111100': 2, '0100110000001000': 1, '1100001001000100': 1, '0001111000011001': 12, '0111110100000101': 2, '0100110010110111': 1, '0111000111001100': 1, '1011110110010111': 4, '0010001111001110': 2, '0001011110100110': 1, '0100111001111001': 2, '0010100000101100': 3, '0001111011110111': 5, '1110000101101100': 2, '1010110000100001': 4, '0101011110011110': 1, '0110100001101000': 4, '0001000100000010': 4, '0000111001111001': 3, '1100011010111111': 1, '1110100101101100': 4, '0011110100001100': 5, '1000001001111010': 3, '1110100110011101': 7, '1110111001101001': 15, '0001111110110110': 1, '1000101000011100': 1, '1011000010001010': 4, '0100111110110011': 1, '1000100010101000': 4, '0001101101011010': 2, '0011110001100001': 12, '0011101011111000': 3, '1110010011001000': 1, '0001101010000010': 1, '0101001010010010': 2, '1001001100011100': 2, '1001011001101010': 3, '1100101110010000': 2, '0000101000101010': 4, '1000010011011110': 1, '1100101010110100': 3, '0101011101010101': 1, '0010110101111001': 1, '1010111000001000': 1, '1001101101101000': 3, '1110100111010110': 15, '0111010111110110': 3, '1000001101001100': 7, '0001101010111101': 4, '00010

01110100110': 5, '1000111010001000': 3, '0011001000101100': 1, '1110100010000101': 2, '1101000110000010': 1, '0110100001110100': 1, '0001001000110011': 1, '11101001011 00000': 5, '1110110100000011': 6, '0110100011111110': 3, '0100101100001100': 2, '110 1010110100011': 2, '0110110001110001': 5, '1100101000101010': 20, '001101011001110 1': 3, '0011001111011110': 10, '0000111010110101': 2, '1010100000101001': 7, '001110 0000100000': 5, '0101110010110101': 1, '1010001111001000': 4, '1010111101011100': 6, '1000101111011000': 4, '0111111011111101': 3, '1011000010100011': 2, '11000010100110 11': 1, '0101011010101101': 1, '1010101101001000': 27, '1111011001100011': 1, '00011 01001110010': 1, '1010100010010111': 1, '1100101111000010': 10, '0111100000110010': 2, '0011101100001001': 3, '0100101100000010': 5, '1100110101101001': 4, '01001010001 01100': 2, '0011010010100110': 3, '1000101010101101': 1, '0101001010100111': 2, '010 1101010101000': 10, '0010000010011110': 2, '0000001111011110': 15, '011001010101111 1': 1, '1100010000000011': 2, '0110011101010111': 3, '1110010101111001': 2, '0111001 110110110': 4, '1101101100011100': 5, '1100101001011000': 6, '0111100011011110': 1, '0001011110111111': 5, '1100000101001000': 1, '0010100101101001': 1, '010010101011111 00': 4, '1100110011100011': 4, '0001110100101001': 5, '1100011111001101': 1, '110010 0100001100': 1, '0101111111100101': 4, '0011000000101001': 2, '1000111001001100': 1, '1011110000111100': 6, '1101011100000111': 1, '1100010001000001': 5, '11101001100111 10': 2, '0001110010000011': 3, '0101001010111010': 1, '0011100000101001': 21, '10100 10111001110': 3, '1110110111110011': 1, '1100111000111001': 1, '1000100001011100': 6, '1100000100010011': 1, '1100011000111111': 2, '0111011110100011': 7, '10001001101 11100': 2, '0000000111111110': 1, '0111010100110011': 1, '0100110001000001': 1, '111 0100100010011': 1, '1111010010000111': 1, '1110010101011101': 6, '0110110101101001': 4, '1100100101011000': 1, '1110000101000111': 2, '1001011011011101': 2, '11001011100 10111': 1, '0110110001110111': 4, '1001101011001000': 5, '0010110001011101': 1, '001 1000110011010': 2, '1001001110000110': 3, '0100111101010001': 2, '1100101001010101': 2, '0010110111011101': 1, '1000101100001001': 2, '1111000101010010': 2, '01100100011 10101': 1, '0100001111110110': 6, '1001101010011110': 1, '0100110000100001': 2, '111 0110101100101': 2, '0110000000001010': 4, '1000100001011000': 3, '0111011111010111': 4, '1110110101111100': 5, '1111110011011101': 1, '1100101111111000': 1, '10101110001 01010': 1, '0001011000101000': 4, '0110100111010110': 2, '0100000011110111': 3, '011 1100011001000': 1, '0001100100001000': 17, '1001011101001000': 1, '101010011111110 1': 1, '0001111000101101': 5, '0101010011010111': 4, '1110111001110100': 1, '0001001 110101000': 6, '1010101010111100': 8, '0101111110010110': 4, '0111001110000010': 3, '1111010010010011': 2, '0100101001101000': 9, '0110000001111010': 2, '00110001101101 11': 4, '0001111110010011': 5, '0001100010011110': 3, '1100000001100010': 7, '001111 0101010111': 3, '0001011011100011': 3, '1110010001010011': 4, '1100011111101011': 2, '1101001010010110': 12, '0100100010111100': 1, '1001010001100011': 2, '0101011100110 011': 3, '1001111101100001': 1, '0001000100010111': 1, '0001001111001100': 1, '11001 01111011110': 10, '0111111000010001': 1, '1100010101111111': 1, '0111011010110110': 1, '0001011010101010': 4, '0111000010101110': 1, '0101001010010011': 1, '10100001111 01000': 9, '0010101100001010': 1, '0001110010101101': 3, '1100111011000101': 4, '111 0010100000001': 3, '0111010010111101': 1, '0110100000101000': 9, '0100111011011101': 1, '1100100001001000': 3, '1010110101011000': 3, '0101010101110111': 4, '10100001101 11100': 1, '0000101101000000': 1, '0101101000100000': 6, '0100001011010110': 9, '010 0010010010111': 1, '1110000100001100': 1, '1100001010110111': 7, '1001111000110010': 1, '0011010010100010': 1, '0011011010101011': 2, '1100011001111101': 3, '01101011011 00001': 1, '0011101111011000': 4, '1000011000111111': 1, '0011110111010111': 1, '101 0001100011010': 3, '1100110001010111': 3, '0001011010111101': 5, '0111000010000110': 9, '1100111000000111': 2, '1010010001100001': 3, '1011110101100011': 1, '00110011100 00011': 1, '0000001111110110': 2, '0011100110100011': 2, '0001111001001000': 1, '101 0010011101011': 11, '0011001001101100': 1, '1111100011110101': 2, '111011101010000 1 0': 1, '0111010100000001': 5, '1110100100100001': 1, '0011111110000011': 1, '0101001 100010111': 10, '0110110000010111': 1, '1000111101011000': 1, '1100011111110110': 4, '1110000001011010': 2, '0011110000011000': 2, '1000011011110111': 10, '0101101100110 100': 2, '0111100011111100': 1, '1010000001101010': 4, '0011100100010010': 1, '11000

11010110011': 15, '0010110111101010': 1, '0001101000010001': 2, '0110100101101000': 3, '0110001100000010': 2, '1011111100101001': 2, '0010110011111101': 2, '11110100100 00011': 9, '0000001010110110': 1, '1110100001000001': 3, '1100111010101000': 5, '111 0100111100110': 2, '0011101010101101': 2, '1110001100000111': 1, '1010101101101000': 9, '1100101110111000': 9, '0011100011110110': 5, '0001100110011110': 1, '00011011101 11000': 1, '0100101001011100': 12, '0011110100111001': 13, '0010000111101010': 1, '1 001011010101111': 1, '1000100010011100': 1, '1001100000001100': 1, '001111100001110 0': 2, '1100101111111100': 3, '0011011110110110': 1, '1110100100000000': 1, '0101111 111010011': 3, '0011001000111010': 3, '0101101100011000': 2, '0010101001011000': 1, '0010110101111101': 1, '0000101001111000': 1, '1100001100000111': 1, '11001101011000 10': 1, '0100101001001000': 1, '0011000101101100': 1, '0001011010011110': 5, '001101 0001011111': 1, '1110100111011101': 1, '0111010111111101': 1, '1001000110100011': 1, '1100000011000110': 3, '1100010010110011': 2, '1110010001000111': 2, '00110101011101 11': 18, '0011110100010001': 13, '0010101001011100': 4, '0001101111011110': 1, '1100 101001000001': 4, '0001000000110111': 2, '1100001001110111': 21, '1000011010111101': 8, '1100011111101110': 2, '1110100000001100': 5, '1010010111101010': 1, '10101101101 01000': 3, '0011010110110110': 4, '1010110010111100': 2, '1000101111001110': 1, '111 1110010000011': 1, '1100011000001010': 7, '0001001001110010': 4, '0010111010111101': 4, '0001100101001100': 1, '1110100100101001': 3, '0001100101101010': 1, '00011111010 01101': 3, '1100010100101001': 1, '1010011110011101': 3, '0001001101110010': 2, '101 0100011101100': 5, '1010100101001001': 7, '1110010001011100': 1, '0101111110001000': 1, '1010010000110111': 5, '0001010100011111': 1, '1110111001111101': 4, '10000011111 01000': 4, '0101100010101000': 1, '1110110101011000': 1, '0111000011110111': 4, '000 1011010111111': 12, '1100001101001001': 1, '0110010001100101': 1, '010011111001110 1': 9, '0000011101010111': 3, '0000111010010101': 1, '1110001111100110': 2, '0010011 111011110': 1, '0001001000111000': 1, '1000000011110110': 1, '1101000100010111': 1, '1000101100011010': 1, '1100111100100011': 2, '0100011110111101': 2, '00010110111101 10': 3, '1001111011110101': 16, '1101000010100111': 1, '1110000001010010': 8, '00010 11001000011': 6, '0000001011110110': 4, '0011001001000010': 6, '1110000010010010': 1, '0001011000000011': 1, '0100001111100110': 3, '0110000111001010': 2, '10000010011 01000': 12, '0110010000000011': 1, '0101101011011100': 1, '1100101110010110': 20, '0 110000000001000': 1, '0001001101010001': 1, '0111000010001110': 1, '011010010110110 0': 1, '0100011010010011': 1, '1100100101000111': 1, '0111010010000010': 1, '1110100 001100010': 5, '1011110110000011': 2, '1110011100101010': 1, '0111011101001010': 1, '0001100100111100': 10, '1000010001110111': 3, '0111100110000010': 6, '1010000011001 000': 6, '0110110000000011': 1, '1110111101001000': 2, '0010000110011110': 2, '01011 00000010001': 1, '0001101010101101': 1, '0111001010010110': 4, '1110111110110101': 6, '0110001000101010': 2, '1110000011010111': 4, '1110110111101101': 4, '11001110011 11000': 1, '1110101110001000': 5, '0101101000110010': 2, '1100011101111100': 1, '010 1000110000011': 1, '0111111010000011': 1, '1110101100000010': 1, '0011100110000000': 2, '0100101011111100': 2, '1100011000101001': 4, '0101101110001010': 1, '10100001110 11010': 3, '1010011101101001': 3, '1001001011101010': 1, '0011011110010110': 3, '111 1010101010111': 7, '1011100110011100': 1, '1100011000101010': 4, '0111100010111100': 2, '0111110100011101': 4, '1100101100010010': 3, '1100110101111101': 2, '00110111000 00001': 2, '1100000000101000': 1, '1100001100100111': 1, '1001111011001101': 1, '110 0101110000000': 5, '0110100010001000': 3, '1011110111000011': 1, '0001001100010111': 3, '1000001001001001': 1, '1100001011001010': 10, '0000111010111101': 12, '001110100 0001000': 10, '0011100111110110': 4, '1000010110010111': 2, '1011000011011000': 1, '1101101010001000': 1, '0100000101100010': 1, '1000100101001000': 7, '10100001110101 10': 8, '0101110101100001': 1, '0110100101001100': 5, '0101101010010110': 6, '110001 0011111101': 1, '0110110101011100': 3, '0001110110001000': 1, '1110100111011110': 1 0, '1100010110010110': 2, '1101011111110011': 1, '0010101011011110': 1, '11111001100 10110': 2, '1000101001001100': 7, '1110111111111101': 1, '1100001011100000': 1, '011 1001010111110': 2, '0101101010100110': 3, '1001011010101011': 1, '0011011110011110': 4, '1111110001101101': 1, '0101110010000011': 6, '0110110011111101': 1, '11101101000 01000': 4, '0111110110110011': 2, '1010011011110111': 2, '0001010101110111': 3, '101

0010010110111': 8, '0010001111110110': 1, '1010100100001001': 5, '0110110100001001': 6, '1100111100110001': 2, '1011111000110111': 1, '0101000010011110': 1, '1000011101000001': 2, '0101111110110101': 1, '1011100011111101': 3, '0100001011111110': 13, '1101001011101000': 1, '1000111000101010': 3, '0010011100011100': 3, '0011111011001000': 2, '1100111001011101': 6, '0100011101000011': 1, '0010010011111010': 1, '0111111100010111': 1, '1010110110001101': 3, '1010100111011101': 1, '0001111000001101': 3, '1010000100001000': 7, '1100011101110101': 5, '1010100001111101': 3, '1100111111000101': 7, '0011110010101011': 3, '1110000101001010': 1, '0101011011110011': 7, '0100100001101001': 1, '0011010101000111': 16, '1110000101110010': 5, '1110100011111101': 1, '0111000101110111': 2, '0001110000010101': 1, '1110000001100011': 1, '0111100111000000': 5, '0111010011010110': 1, '0001101111111101': 8, '1110100000010101': 1, '0111000010001000': 2, '0011101101101000': 6, '0111101001010101': 1, '1001101011110101': 2, '0000011001111010': 1, '1010110100001100': 2, '1110000100101000': 3, '1110000011011111': 1, '0000110110011101': 1, '1110000101011000': 2, '0011100011011101': 3, '1100101101010101': 5, '1100011100101010': 2, '1001001111011110': 1, '0001101011100000': 1, '0100101011110110': 2, '0100011001011101': 1, '1000111010111111': 1, '0100101101011000': 1, '0011010100011111': 1, '1011100000101001': 1, '1001011101001010': 1, '1110011010010111': 2, '1001001010001010': 1, '1100001001101010': 4, '1110001010000010': 1, '1010000001001000': 5, '1011110101100001': 1, '0001100000110101': 2, '0110011001101001': 1, '1000010111000111': 1, '1100011001111111': 4, '0000101110111000': 1, '0101101011011000': 1, '0101001111011110': 3, '0001010110011110': 4, '1110110000001000': 2, '1011001011110010': 1, '0111110101000001': 11, '1001001101111010': 2, '1001111000111001': 6, '1001001001110111': 1, '0011000101110010': 1, '1011100111011000': 6, '1001011010010111': 4, '1100110000100001': 7, '1011100110000110': 2, '0101010001010111': 7, '1010101010101101': 1, '1110000110010011': 1, '1000100100101000': 1, '0110110101011001': 3, '0011100101011100': 2, '0001001110010011': 1, '0100101001000001': 2, '0001111100100011': 1, '1110110010010011': 2, '1110100010010000': 2, '0100110100110001': 1, '1100111010000101': 3, '1101001100010010': 5, '1001011111010110': 2, '0111000101110010': 2, '1110010001111100': 2, '1001101010111110': 2, '0001011110000010': 3, '0111101000111000': 1, '1001011111111101': 1, '1101111001110001': 1, '0001110000001001': 5, '1101001001110010': 1, '0111000101100111': 1, '1100100100100010': 2, '0011110101001100': 3, '0101101111010110': 5, '0100001011011110': 4, '0110000011110110': 18, '1110010000000111': 5, '0101001110110010': 1, '1000110000101000': 1, '0011000100001001': 1, '1000001101011010': 9, '1111110001110001': 1, '0011010000101000': 1, '0011101001101100': 3, '0011000110001100': 2, '0111100111010110': 6, '0011100110000110': 3, '1000001011111000': 1, '0011101001111001': 1, '0110000011010110': 11, '0011100110111100': 5, '0100111000101001': 6, '0011000111110111': 1, '0010101001101000': 2, '0001011011111110': 2, '0100011110110111': 2, '0001110101001001': 8, '1110111111100110 1': 3, '0110100001100001': 2, '0001001000000000': 1, '0110100100101000': 2, '1110000110011100': 7, '1010010101000010': 1, '0011001110101010': 5, '0011010000100111': 2, '0100101101100000': 2, '0001111111001000': 8, '0011010010001010': 3, '0001111110010101': 1, '0111010001000111': 3, '1010010110011111': 1, '0100111101100001': 11, '1110101111101100': 1, '1000010101011101': 2, '1001111100100001': 7, '0011011000101001': 5, '0001001100011000': 2, '1110110000101000': 7, '0010110000101001': 7, '0010000001101010': 1, '0001001100111001': 1, '0011110011001101': 2, '1011110110110111': 1, '1100001100010010': 9, '0011001010100111': 1, '1110111101010001': 2, '1110100001010101': 1, '1100101111111110': 3, '0001100011111100': 3, '1110101010011101': 2, '0000001111010110': 2, '1110111000001001': 5, '0101001000010001': 1, '0000101000101100': 3, '0001100000111000': 3, '0110110001011101': 1, '1110110001101101': 2, '1101110011110101': 2, '0010100000001100': 2, '0011100100100001': 4, '1110000000101001': 1, '0101000000010111': 2, '0111101110001000': 3, '0011000011111101': 3, '1010010100001001': 4, '0100111011010111': 1, '1011011101000011': 1, '0110110101110101': 3, '0011000001111111': 1, '0101101010100011': 5, '1000101010111110': 2, '0100011010010111': 5, '1010111101011101': 5, '0011000111011000': 1, '1000110101011101': 4, '0001101110001010': 8, '0001100110001000': 16, '0100111101011100': 2, '1010000101101010': 1, '1100000111100110': 1, '1011110000111001': 5, '1111110000001001': 2, '0101001010101010': 6, '0001101

011101101': 1, '0111110010110101': 4, '1110010011111111': 1, '0011000111110101': 1,
'0100001000001010': 7, '1111100010000000': 1, '0011010010101000': 1, '00101011011010
00': 1, '0011100111111101': 5, '0111110110100011': 15, '1100101000100001': 1, '00011
11110011110': 3, '0011000110111010': 1, '1110001010110110': 5, '1000011010110111':
5, '1011101100011000': 1, '0011100000100001': 6, '1100001000011010': 4, '10000110001
00011': 5, '1010110001010111': 1, '1011001000011100': 1, '0100111111011101': 3, '011
1100010000011': 1, '1110011100110111': 1, '0111011101010111': 1, '0100111001111100':
1, '0110100101100001': 2, '0001001111101000': 5, '0110110001010101': 6, '00100001010
11010': 1, '0011110000001100': 3, '0001000110001110': 1, '0001011001111111': 4, '101
1110111011000': 1, '0111110111101101': 1, '0101111000111001': 4, '0011010110001011':
10, '1011100100001001': 1, '0011001100001000': 3, '1001101100011000': 2, '1100111001
100101': 9, '0011010101111111': 2, '1000111011011111': 1, '0110110001010001': 2, '01
00101111000010': 1, '0011111100101000': 2, '0011010000000011': 3, '101111011100010
1': 2, '1100000011110010': 1, '0111111110111101': 1, '0111110011110111': 6, '1010010
011110011': 5, '1001111111011100': 1, '0001100111111100': 3, '0001101011111110': 2,
'0011100010100010': 1, '0010100100101001': 1, '0100011111000110': 1, '01111100000111
01': 1, '1100111100111100': 1, '1001011001001010': 1, '1000110001101000': 3, '010011
1101010101': 3, '1110010100100010': 3, '1000011011010111': 4, '1110010101111101': 1,
'1000101011101100': 2, '0011111000101101': 1, '1101110000000001': 1, '00111000011010
01': 9, '0111101101000010': 3, '1110100001100000': 1, '1001111011011101': 9, '111001
1001111100': 1, '1101010010100011': 6, '1000010010010110': 1, '1100101010110111': 3,
'1010010100001101': 1, '1011011010110111': 1, '1101100110010110': 2, '01010111101101
10': 2, '1011010011000011': 1, '0001110111101101': 1, '1110000101000011': 1, '101110
0011110101': 1, '0100011001000011': 1, '0101101110000010': 5, '0110010000100001': 1,
'0110100110010101': 2, '0000011111001011': 1, '1110010101011100': 3, '11101001101111
00': 6, '1110100011111010': 1, '1110000101110111': 6, '0011011111010111': 1, '010000
0010010110': 2, '0011010000011001': 2, '0100110011010111': 2, '0011101101101001': 2,
'1100100001110000': 1, '0001101011011101': 5, '0111011011110111': 4, '00111110000110
01': 1, '1110011011010111': 2, '1110000010111110': 9, '1110000010110010': 2, '011101
0101010001': 1, '0111110010010111': 3, '1111010011110110': 1, '1010100111001010': 4,
'0111111000101101': 1, '1100011001100010': 4, '0011010100000011': 3, '11100000110110
10': 1, '0111110000100011': 1, '0000100101100010': 1, '0101011100011001': 1, '000101
1111000011': 4, '1010111100101010': 1, '1000011101101000': 1, '0010010111010111': 1,
'0101001100000000': 1, '1101111100010101': 2, '0110000001101000': 2, '10011010001110
00': 4, '1110100001001000': 3, '0001011101001001': 8, '1001111000001001': 9, '110100
1000110111': 2, '0011100101010100': 1, '0001001110011101': 1, '0000111100101001': 2,
'0001010011110101': 3, '0001100010111110': 2, '1110101110111100': 1, '11000000110000
11': 1, '1100110110100101': 1, '1010011011011110': 2, '0011110001110111': 6, '010111
1001000011': 1, '0101001011110010': 2, '0100000011100110': 1, '0011000111000000': 1,
'1011010100110111': 2, '0001111010000111': 1, '0110111101000001': 4, '11111000111010
00': 2, '1011110100001101': 1, '1011000010100010': 4, '1100010001010001': 1, '110000
1010110010': 1, '1101011100010011': 1, '0100000110010110': 1, '1100100110101000': 1,
'0101100111010101': 1, '1011010010110110': 1, '0101000110100011': 1, '00111010100111
10': 5, '1100110110110011': 1, '1000111000000001': 1, '0000100001101000': 3, '100110
1001101100': 3, '1010000111111111': 1, '0111000001001010': 7, '0111010001000010': 2,
'0111000100000001': 1, '0111000000001000': 1, '0010010100001010': 1, '11100000111100
11': 2, '0111100111010000': 1, '0100000110110111': 1, '0011100100000010': 2, '000100
1010010111': 3, '0011110010011110': 3, '1001001010001110': 2, '0001001010111010': 1,
'0011001011011110': 2, '1000110001100001': 2, '0001010001100010': 3, '000110101000001
01': 1, '0111101100001100': 2, '0011010101001000': 2, '1001110110000011': 1, '010110
1010100000': 2, '0011100001100010': 3, '0001011110000111': 9, '1001110110111101': 1,
'0101010111010011': 4, '1110000110101010': 3, '0001000110100010': 2, '11001110011011
01': 2, '1110110110010011': 3, '0111101100001000': 2, '1100001110011101': 1, '010110
1111000000': 1, '1100000101110101': 1, '1111111100000001': 1, '0110001111001010': 1,
'0001011100101101': 1, '1100001001010010': 8, '0001111010100101': 4, '11001010111010
10': 2, '1110001101011000': 1, '1101011101010111': 8, '0111101111011100': 1, '100001

1101101001': 6, '1011110010011101': 2, '0011010101000010': 7, '1100110110011101': 7, '0011011101010111': 4, '0001111001100011': 3, '0001100100001001': 2, '00001110001000 01': 1, '0001111010011101': 17, '0011101111011101': 4, '1000110001010101': 1, '01101 10000110101': 2, '1101011001000011': 2, '0101010011110011': 4, '1010000100101000': 3, '1110100000101010': 14, '1110110000001101': 1, '1000010111000011': 5, '1010010111 111111': 2, '0111001110010011': 1, '1111010100110111': 4, '1010011011111110': 3, '11 101100010010111': 2, '1110011001111101': 3, '1011100100110100': 1, '001101001100101 1': 2, '1110101101011000': 4, '1011100011111000': 2, '1000110010110101': 3, '0011010 000111001': 2, '1000011011101010': 1, '0001100101000010': 1, '1110010110110101': 4, '1010010100000011': 3, '0100011001101001': 3, '0110110101011101': 1, '11101100001000 11': 9, '1000100001101100': 1, '1100000100100011': 2, '0111110000001001': 6, '001110 0101101010': 8, '0101011010111110': 1, '1010000111100011': 2, '0111110011011101': 2, '1100010011010111': 18, '1110110011101011': 1, '0101011011100101': 2, '0101101000101 001': 2, '1110101110010111': 1, '0000101101001001': 2, '0111000110100110': 4, '11000 01110010111': 6, '1010011101000111': 1, '0100011001001001': 1, '0011001111001000': 5, '1011100111101000': 5, '1110100010011000': 3, '0101101111101000': 3, '00011110110 10110': 1, '1110101010111000': 1, '1010100001001100': 8, '1100001001100000': 2, '011 0100110111101': 2, '1000001010110110': 4, '1001000010111110': 3, '0001010000100001': 4, '1111110011110111': 1, '0110000111010111': 1, '1100101110100000': 2, '00010011111 10010': 1, '0111100100101100': 2, '0111010110011110': 2, '0111110110101101': 1, '010 1011000000111': 1, '0001011000111111': 2, '1011001010010110': 1, '1011010011010111': 3, '1110110011110110': 1, '0111000101001000': 1, '0000001011101000': 1, '11001011111 00110': 2, '0010100011111110': 1, '1110111101111001': 3, '0100001010101000': 2, '100 0011111111101': 1, '1110010110011101': 7, '1010110000101101': 3, '1000011001011101': 1, '1100101101101100': 5, '1100101000001100': 9, '0111110000000101': 1, '01110100100 01011': 1, '0011100001000010': 6, '0111100110110111': 1, '1011100101111100': 1, '100 0000101111100': 1, '1110010000101111': 1, '0100001111001010': 2, '1001111011110111': 1, '0111000101101010': 5, '1000011101001101': 1, '0001010011010111': 3, '01011000001 10010': 1, '1110001111011010': 1, '1101011011010111': 2, '0011011000001000': 1, '001 1100111100000': 1, '1100111101011000': 2, '1100110100101001': 1, '1001101111011100': 8, '1100101001001001': 2, '1100100110000101': 1, '0110000111110111': 1, '01001011000 01010': 2, '0101111001001001': 2, '0101010010010111': 10, '1010010100110010': 1, '11 01001111110110': 1, '1110101100101000': 4, '1011010011110101': 4, '110111101001101 1': 1, '1011000110010110': 12, '0110001100011100': 1, '1110010111111011': 1, '001111 0010111110': 2, '1110000101011101': 2, '1110100001111001': 1, '0001000110101010': 2, '1001001100011010': 1, '1011000001101000': 3, '0011011111011101': 5, '000010111011000 11': 8, '1010001101011100': 4, '0111010101010011': 2, '1110010100101010': 3, '011110 0100110000': 2, '1100101000001010': 1, '0101101100111100': 11, '1110101001001001': 1, '0011110110100101': 3, '0011000000011010': 3, '1010111011101011': 1, '00110000001 10111': 6, '1010011111010111': 1, '0110101001101000': 1, '0000001000101010': 15, '11 1111100100001000': 2, '1100001011100111': 3, '0001001100010010': 12, '111001011101111 1': 1, '0011010101001101': 1, '0001110100011100': 3, '1100110100001001': 2, '1100000 000100011': 1, '1010010010111110': 2, '0101100100010010': 1, '1000111110011100': 1, '1100101111100010': 1, '0101011011000011': 2, '0001011100001100': 2, '01000111111001 11': 1, '1011101100101001': 1, '1010100011111100': 4, '1110010100001001': 2, '100111 0100001000': 1, '0001001101000011': 2, '0011100110001100': 4, '1100111011010011': 2, '1010010010010101': 1, '0001101010001010': 2, '0010100011011110': 1, '11101101110100 11': 4, '0001001100111010': 4, '1011000111011100': 1, '1100111000101010': 2, '011110 0011110100': 1, '1000011000101001': 6, '0001000100011100': 4, '0011100010011101': 4, '1100110101100101': 1, '0110000100010010': 2, '1010110111011110': 1, '10101001011110 01': 2, '0000101110011110': 1, '0001110000010111': 1, '1110000001100001': 2, '011110 0000010000': 1, '1010000011100010': 1, '0110100111101000': 3, '0110110110010111': 2, '0111110110000111': 1, '1000000000101000': 1, '0101101110001110': 1, '00110001001110 10': 2, '0000111010101101': 2, '1110000000100001': 1, '0001111100011111': 1, '001011 1011101101': 1, '1011110000101001': 3, '1000011111001111': 1, '0001010001101001': 1, '1111110010110111': 4, '0001001010010010': 4, '1010110110101101': 3, '001101010100 10

01': 9, '1000001110011000': 2, '0011110001110101': 4, '0111010011000101': 2, '110111
1110010110': 3, '0011011111000011': 1, '0001010000110101': 1, '0101000100000010': 5,
'1001111011101000': 2, '0011100110101010': 2, '1100100010110101': 2, '11100001000101
11': 3, '0101000000110111': 2, '1001111111110101': 4, '0011100111001100': 1, '010101
0111010110': 3, '0011100110101110': 1, '1111111111011101': 1, '1000111101010001': 1,
'0101110110000011': 7, '1110000010011100': 1, '0010000011101110': 2, '01111001100000
11': 2, '1000101011100000': 1, '0000001001111100': 5, '1010110011001101': 1, '111010
0110100000': 2, '1111111111010101': 3, '1110011100000011': 3, '0001111001000001': 4,
'1101001000110010': 2, '1101111000110001': 1, '1100011110100101': 2, '00110101110001
01': 1, '1000000000100010': 1, '1101110011000101': 1, '0101100000010111': 1, '011101
0111000011': 6, '1011000101101010': 3, '1111000010000110': 1, '0011010100010011': 3,
'1010110001011100': 7, '1010010011110110': 2, '0101111011110111': 2, '00110100100101
10': 4, '0001010101101001': 1, '1000011011110110': 1, '1100100011100011': 1, '111101
0101000011': 3, '0111101011110101': 1, '1100011000000010': 5, '1111000110110110': 2,
'1100101101001010': 1, '1110110111010101': 1, '0101110110110111': 2, '10110001110111
10': 9, '1100110101111001': 1, '1010100011101010': 3, '0011010010000010': 1, '001110
1010111100': 4, '1100010100110111': 8, '0011101100111000': 1, '1010110100011010': 1,
'1101011001101010': 1, '1100011011101010': 3, '1110110010101011': 1, '00110000000010
00': 5, '0111011011110011': 1, '1110110000110101': 5, '1010010101010101': 1, '011110
0111011101': 1, '1110010110110011': 5, '0001101000000001': 2, '1000110110011101': 4,
'0000011011100011': 4, '0010000001111010': 1, '1100010101000001': 5, '11011110111101
11': 1, '0011101100011000': 5, '0011001111001110': 2, '1001101110111110': 1, '111010
1000001000': 4, '0100111010100101': 5, '0001111000100011': 1, '1100101111011101': 1,
'1011010110010011': 1, '0111000100100011': 1, '0001100110010110': 3, '01000111011101
01': 1, '0000111001001000': 1, '1000101101100001': 1, '1110011011110110': 3, '011101
1011010110': 1, '0101110001100111': 1, '0101101000010000': 1, '0111100011101000': 6,
'1101001110010111': 1, '0111010111011101': 2, '0101111000100010': 1, '00110111100101
11': 4, '1100000011100110': 5, '1001101100001001': 3, '1010110010011100': 1, '010110
0111001000': 1, '0101110101110001': 1, '0100001011100010': 3, '0100101110111100': 1,
'1101101101010100': 1, '0101011011111101': 3, '1100011101100011': 6, '010100100111 01
11': 5, '1101111000111101': 1, '1010101000001000': 4, '0110101000001000': 4, '000000
1001111111': 1, '0011001000101000': 3, '0111111000111101': 1, '1010110000100111': 1,
'0101111001110111': 6, '1100111111001101': 6, '0111100111011100': 2, '01010100001101
01': 2, '1101000101000010': 2, '1101111000100100': 1, '1100011010100011': 2, '110100
0111110111': 1, '0011011101000011': 4, '1000001011000110': 3, '1011100111011101': 2,
'1101101000101000': 1, '1110100110010010': 1, '1100001001101000': 8, '10110100110111
10': 1, '1000101110011110': 3, '0101010001100111': 5, '0101100011001000': 1, '001101
1110100011': 11, '1011011000110111': 1, '1010100011111101': 2, '0001010000000010':
1, '1000000111001110': 2, '0001110100011101': 3, '0101000100010111': 1, '00011001011
01000': 1, '0011010111011110': 2, '1100001111010011': 2, '0010000100000010': 2, '111
1010001100011': 2, '1010010011011101': 2, '0100101001110001': 1, '0111101011010101':
1, '1010010101101010': 1, '1100001110110101': 1, '0010110001100001': 1, '01010110000
10011': 1, '0101000101100010': 13, '1000110000001001': 1, '1100000011110011': 1, '10
11010001010111': 1, '0001111110000111': 2, '0011010101101010': 5, '1000011010101001
0': 1, '0101101001001100': 1, '0000101100101100': 2, '0001011100011001': 1, '0101110
000010001': 3, '0001001111011000': 2, '1100010001110101': 3, '0101001110001110': 3,
'0011000010111100': 1, '0111010000100010': 2, '0001100100101001': 1, '10000110011111
00': 5, '0111000010001010': 3, '1010100010111110': 1, '1010000011011010': 2, '000101
1010000110': 1, '1110000000010111': 4, '0101011000100010': 1, '0010101110011000': 1,
'0101011010010110': 4, '0001011001001001': 1, '1110000001011000': 1, '11000000000100
10': 2, '1011000010000010': 2, '0001010101000011': 5, '1100000011111110': 11, '11011
11101000001': 1, '0111000110000111': 2, '1101011111000011': 1, '1010011111001101':
1, '0101101000010100': 3, '1000011011001011': 1, '0011010110100010': 1, '00010011111
11100': 2, '0011011010001011': 3, '0001011000010011': 1, '0111000000010111': 1, '111
0011001010111': 2, '0111011001110111': 3, '0011010111000011': 1, '1100000011010111':
2, '1000000100101010': 3, '0011001100100010': 1, '1111010101110010': 1, '11101000101

11110': 2, '0111111100011100': 1, '0010010011100011': 2, '1110111100100001': 1, '000
1100110011101': 1, '0001111110011100': 3, '1010000100111010': 3, '0011111011100101':
3, '1100011011001011': 2, '0001011010010011': 5, '0100001110111110': 1, '01010110001
00011': 6, '1010000011111010': 1, '0111100001101100': 2, '1011101111001000': 1, '110
0010111110011': 2, '0100011101000010': 1, '1001001010100011': 4, '1000101011111100':
2, '1100111111101101': 2, '1000110110010101': 2, '0100101000100100': 1, '01110100011
01001': 1, '0001011110111110': 5, '0001101110110110': 5, '1000001011100011': 1, '101
0110010101101': 9, '1100001111110011': 2, '1000001110011100': 2, '0111010100010101':
2, '0011001110011100': 1, '1010110001101100': 2, '0011001101100010': 1, '01101010101
01000': 1, '0000001000100010': 1, '0110000100000111': 1, '0101000101010111': 2, '010
0111001010001': 1, '1000010111011011': 1, '0001011001100001': 2, '0011100000011101':
2, '1110001100011010': 1, '1111100111000000': 1, '1111001000011100': 1, '01110001100
10111': 4, '0100010100100011': 1, '0011100001100000': 1, '1000011111111111': 3, '101
0101011111000': 2, '0001101110111010': 1, '1110111000100001': 1, '1000000011011110':
4, '0011100110001010': 8, '1011010101010111': 7, '1101001110110110': 3, '00011101000
01000': 1, '0111111110100011': 1, '1111100000101100': 1, '1000001010001110': 1, '010
0001111110011': 1, '0111110101001001': 3, '1001011010110011': 3, '1110001111001010':
3, '1000001110111110': 3, '0110001001111010': 1, '1100011100111111': 3, '10001001010
11000': 2, '1100011011111010': 1, '1000101000001001': 1, '0001111011111110': 1, '000
1000100010010': 3, '0101001010110010': 1, '1100000100010010': 2, '1101010011110011':
1, '0001001101010010': 5, '0011101111111000': 1, '1001111110010111': 1, '01111100111
01101': 1, '1001001010101000': 3, '1011000001101100': 1, '1000001000101000': 3, '110
0010001101001': 2, '1110001101000010': 5, '1000111010100101': 2, '1011100101101100':
1, '0011010001110101': 1, '1100111001101100': 3, '1110011111101101': 1, '10001000111
11110': 1, '1101011000010101': 1, '1001000110111110': 1, '1000000101010111': 1, '010
1111100011001': 1, '1010100110101100': 1, '1000000010110110': 2, '1001000011011100':
1, '0001110101000111': 1, '0001100000101001': 1, '0110010011111101': 1, '10100101011
10011': 1, '0001100111010101': 2, '1110111101110001': 1, '0110111100001001': 3, '001
0110010110111': 1, '0101001111010101': 2, '1000111001001000': 5, '0111101010100010':
1, '1110010011011110': 2, '1000001101000010': 2, '1110010011111101': 3, '00111001010
11010': 2, '0010000011111111': 1, '1100100001111010': 1, '0100101111000000': 1, '001
1101001001100': 2, '0011011110001010': 1, '1100000101100011': 1, '1010000111001011':
1, '1110010101111111': 1, '1010101110101000': 7, '0100001111001000': 1, '11100000011
10100': 3, '1001010100110111': 2, '1010101111011110': 2, '1010010101101000': 1, '100
0011011100111': 4, '1110010111001000': 4, '0001001111010101': 2, '0001011000010101':
1, '1000101101101100': 2, '1000011010010111': 1, '0000011011010111': 2, '11011110000
00101': 1, '0010100111111110': 2, '0000100101001100': 1, '0111101111101000': 1, '110
0101001100000': 6, '0001111110001111': 1, '1010001100001000': 1, '1100101111100000':
1, '1010011001111101': 2, '1100001110001000': 3, '0010000010111101': 1, '10001100011
11101': 2, '0001101010111010': 1, '1000000011101000': 2, '1001101010111101': 1, '000
0011010111101': 1, '1011001100001100': 1, '0111110010100111': 3, '0100001111000011':
4, '0011001000000010': 2, '0110100001001000': 2, '0011010000011101': 1, '01010001010
00011': 1, '0100111111010111': 1, '1011100110011110': 6, '0110100001110001': 1, '111
1000100100011': 1, '1000001010001010': 1, '1100110011100111': 2, '0011110101000111':
3, '0110111101101001': 4, '1001101011010110': 1, '0001011010001011': 2, '10001010111
01110': 2, '0110000110110110': 1, '0001001111010011': 1, '1110111001110111': 2, '010
0111111111101': 1, '1000011001101101': 1, '0001101100110111': 1, '0011011101100011':
1, '1000001011100110': 6, '1011101101101010': 1, '1111000011010101': 1, '00101101100
01101': 2, '1101000001000010': 1, '1011100101001010': 2, '1111110001101001': 1, '001
1111101001001': 7, '1000110101010101': 1, '1101011110010110': 3, '1100000111011010':
1, '0000101110011100': 3, '1001100011001101': 1, '1010011101111111': 1, '00111101001
01101': 8, '0001101000100000': 3, '1111001001100010': 1, '1010110001111000': 1, '010
0010001110111': 3, '1100011001001001': 8, '1011110100110001': 1, '1100101100001001':
5, '1100100100001000': 6, '1010101110111000': 2, '1010010001011001': 2, '11010111111
00101': 1, '0100111111110111': 2, '1100110100000011': 3, '1001100011111100': 1, '101
1000010100110': 1, '1100011101010001': 6, '0111110000111101': 2, '0101101010000110':

3, '0110101011001000': 2, '0011100011110100': 1, '1101000000110010': 1, '00101001000
11100': 2, '0000001111001100': 1, '0001100100110101': 1, '0101010000010111': 6, '101
0101110011000': 3, '1110011101000111': 1, '1011100000000001': 1, '1010000001001100':
1, '0110100100100010': 2, '0011101001001010': 6, '0110000100110111': 1, '01011101010
10111': 1, '0101001110000111': 1, '0101110010100101': 2, '0111110110011101': 1, '101
0110010010101': 5, '0111110100111101': 2, '1110011001100001': 3, '1001101001100001':
1, '1001011101100111': 1, '1101111111000101': 1, '1001110011011101': 1, '11010010011
01000': 1, '0111011111110101': 1, '0001111011010111': 3, '0111100000000001': 2, '100
10111101001001': 1, '1010100111111110': 3, '0101010011010110': 1, '0011001100010111':
1, '1000011011011101': 1, '1111001110100010': 1, '1111110100111100': 1, '11000000111
01110': 1, '1010100101101001': 8, '1101001100000010': 3, '1100001011111111': 1, '000
1101110100101': 1, '1100001010101000': 3, '0101011010100010': 2, '1010000011011100':
1, '0011110010000101': 1, '1110100001000000': 6, '1110110000100101': 2, '01100101010
00111': 1, '0010000001111100': 1, '0001011011111111': 3, '1010100101011001': 1, '001
1100110000010': 4, '1001001111111110': 1, '1100011100001010': 6, '0011100010100000':
5, '0100001001010111': 1, '1010000011100110': 1, '0111100000010100': 4, '11001010010
00010': 2, '1100010010010011': 1, '0001101110101100': 3, '1101011010010111': 2, '011
0110001111001': 2, '1000101100011000': 1, '1110011001001101': 1, '1110011100010111':
6, '0111011101110111': 2, '1000110001110101': 1, '1110000101100001': 2, '11100101011
11100': 1, '0101001011100010': 1, '0100000011110110': 2, '0100011110001011': 1, '111
0110011001101': 2, '0001011110001010': 3, '1000100100011100': 1, '1010111100001000':
1, '0011011010110011': 2, '1101011111110111': 4, '1010111000001001': 3, '11110110010
10111': 1, '1000101111111100': 1, '0111110110001000': 3, '1001101011011100': 1, '111
0100111100000': 1, '1100011001010001': 1, '1110100010110100': 1, '0001111001111111':
1, '1110111100101000': 1, '0100011011110011': 3, '0011010011111111': 1, '01100001011
00010': 2, '0111000011101010': 1, '1110100101001001': 9, '1011001011111110': 1, '010
0001011110011': 1, '0011011011111110': 2, '0111010110001111': 1, '0001111110010110':
2, '0100110001111101': 2, '1001001101011010': 2, '1000011000000011': 1, '11000010011
10100': 1, '1001011101010111': 3, '1100000011110111': 2, '0011011101101001': 3, '100
0101011001010': 1, '0101110100010101': 3, '1001011010100111': 3, '0101111000100101':
3, '1110100011000110': 1, '0101101111110000': 1, '1001011010100010': 2, '10010000010
00010': 1, '0001011101001011': 2, '1111110111011101': 3, '1100001010010111': 2, '000
0111010101000': 1, '1110101011001100': 1, '1110100101110101': 1, '0110100000001000':
3, '0001001000101001': 1, '1001111001000001': 1, '0011000110100110': 3, '01010011010
10111': 2, '1010010101011001': 3, '1010110010001000': 1, '1001011001100111': 3, '010
1001111100011': 1, '1100111011011101': 5, '1000000010101110': 1, '0011000001101001':
2, '0101101110111000': 1, '1000100000001100': 1, '0001000010000010': 1, '01010111000
01001': 1, '0000000100000010': 1, '0100111101010111': 1, '0001111101101010': 1, '001
0110110001000': 1, '0111110001101001': 3, '0000100111101000': 1, '1100010001100111':
2, '1001110000011101': 1, '1110100011111110': 8, '1010010110101010': 1, '11100100010
11101': 1, '0001111100110001': 5, '1010010110001101': 1, '0111100100100000': 1, '001
1001011111100': 2, '0100101000001100': 1, '1010010111000010': 1, '1110110111111101':
3, '0001100100100001': 2, '1100110000001001': 3, '1110100111000110': 3, '01101001010
00010': 1, '0011000101101000': 4, '0110110000110111': 2, '1010001001111000': 1, '001
1111111101101': 1, '0001101011100001': 1, '0001110111010111': 2, '0110111001110111':
1, '0001010001010111': 2, '0101010010110011': 4, '0000100101101001': 1, '01111100001
01000': 2, '1110100011101110': 2, '0100001100101010': 4, '0100010111110111': 2, '110
0101110110110': 2, '1110011001100010': 1, '1000011101111000': 1, '1000011010010011':
1, '1110101001101100': 1, '0010101000001000': 1, '0011000101010111': 1, '11000010011
00101': 1, '1100011100110011': 1, '0000111101011100': 2, '0110100100001001': 2, '111
1000100010010': 2, '1100111001011100': 2, '0000010000001010': 1, '0001101010100011':
4, '0000011111010111': 2, '1110011100110011': 1, '1110111000100111': 1, '11111001000
11100': 2, '1011100100100010': 1, '0010000010111110': 5, '1010000001100000': 1, '010
0001001110111': 2, '0111100000110000': 1, '0011111100100001': 1, '0011010010101111':
2, '1010011001101001': 4, '1000011100100111': 1, '1100101111000101': 1, '01100001111
10110': 6, '1111100110011110': 1, '1010000110011101': 1, '1010001101011010': 2, '101

0101010011100': 2, '1110100110011000': 6, '0100001011100110': 4, '0110111001000001':
1, '1110001100100010': 4, '0010110001111100': 6, '0001101000001001': 4, '01011111011
10111': 3, '1011110000101000': 4, '0011101000001001': 1, '1110100011111000': 2, '001
1000001001000': 4, '1110110011101101': 8, '1000011101010111': 6, '0101101001101100':
1, '0101011100010001': 1, '0011101000110100': 1, '1101101010110110': 5, '10101100101
01000': 2, '0011100000011010': 1, '0001101101010111': 1, '1010111111011101': 3, '010
1110010110011': 2, '0101001011000110': 1, '1001111110000011': 4, '0111100010000111':
1, '1001001101010010': 1, '0101111101000011': 2, '0000101001011000': 1, '10110000001
00001': 1, '1100110110010111': 4, '0001011101001100': 1, '1000001001111101': 1, '110
0010001110011': 1, '0111100110101000': 5, '0010010100010111': 1, '1110001011011011':
1, '1011010000111101': 1, '0001110001010101': 2, '1010110001001000': 2, '11111101100
10111': 2, '0010110100001101': 1, '0100000111000010': 1, '1101101100000001': 1, '001
1111110101101': 1, '0111110100010100': 1, '0101101000100010': 3, '0011010100000111':
1, '1100100000111100': 1, '0110011011000011': 2, '1010110100001000': 6, '11101011000
01001': 1, '1011100100101001': 2, '0100000011110010': 1, '0010100100101100': 1, '011
0010100100011': 2, '1110011000100010': 1, '0111011000000010': 1, '0001111111110111':
1, '0001101100011001': 3, '1000001010011101': 2, '0110100011001000': 2, '11000000001
10111': 3, '0110111110110101': 1, '1111110000010101': 1, '0100101000001000': 3, '010
1111100111001': 1, '0011001011111000': 2, '1100000111100011': 2, '0111100010100110':
3, '1101101111111000': 1, '0001011110100111': 6, '1010101000001010': 1, '00011001111
01000': 1, '1110100110000000': 5, '0001001000001100': 2, '0101001010000111': 1, '101
0000100001001': 1, '1100010100100011': 3, '1110000010101110': 3, '1000001100101000':
1, '1001011100101001': 1, '0101101011111000': 2, '0111010000000011': 2, '01101101010
10111': 1, '0011101000101001': 3, '1100110100000001': 5, '0011000100100111': 1, '111
0000111010011': 4, '1001001100001001': 1, '0000101001001100': 3, '1110000001001001':
1, '1011000110101000': 1, '1100101110010100': 2, '0001000000111100': 1, '01100100001
01001': 1, '0011000001010010': 2, '0000101000111010': 1, '0001111110101101': 5, '101
1100001101010': 3, '0111010011100101': 2, '0011010010001011': 1, '1010100010101100':
2, '1000011100001101': 1, '1001111010101000': 2, '1110010001001001': 5, '11000010111
10011': 2, '1110110011100111': 2, '0100111001011101': 2, '1100011110001101': 1, '100
0010111010111': 3, '1001110111011101': 2, '0100001011101110': 1, '1101011011010101':
1, '1100000101110111': 2, '0001100101000011': 1, '1001100100011000': 2, '00010011100
11111': 1, '1010000111000110': 2, '1110011011111111': 1, '1100110100110111': 4, '010
1101000110101': 1, '1100111101001101': 1, '1111101101000010': 1, '0011100011111110':
2, '1001011111000011': 1, '1010010110111110': 1, '0010100011111000': 1, '11001001110
11100': 1, '0000101000001000': 3, '0001011110101110': 1, '1001000000011100': 1, '000
0001010101000': 1, '1100111100000010': 5, '1110001111100010': 1, '0001011111000111':
1, '0001110010110111': 4, '0101011000110010': 1, '1010101111011100': 2, '00010100100
10111': 7, '0111110111111101': 3, '1110000101101001': 1, '0110011011110111': 2, '110
0111000101000': 2, '1011101110001010': 1, '0001111100001100': 1, '1000011111101011':
1, '1110001011001000': 1, '1000011100101010': 2, '0110010100000010': 1, '11000000101
10010': 3, '1000111000111111': 2, '0001001101001001': 1, '0101001110001010': 4, '100
1111000011101': 2, '0111000111000010': 1, '1110011101101001': 1, '0001111001100111':
1, '0101001000001000': 1, '1100110000101001': 8, '0110110101110001': 2, '00101010111
11110': 1, '1011110100101000': 1, '1110111111001110': 1, '1110010111101000': 1, '010
0111001011001': 1, '0000110101001001': 2, '1100000111001000': 1, '0001000100111100':
1, '0011100010100011': 5, '0100011011111110': 1, '1010110011100101': 2, '01110100000
10001': 1, '1011100100111000': 1, '0110110010011101': 1, '1101100011110100': 1, '110
0101101111101': 1, '0110010001100010': 1, '1010000000101100': 1, '1101011101000111':
2, '1010101000111010': 1, '0100010010010111': 1, '0100011011100010': 1, '11011101001
00001': 2, '1100000111110111': 2, '0001111100110011': 1, '1110010011101111': 1, '001
1001010001000': 2, '1110101101101000': 3, '1110010100010010': 1, '1110010101100011':
3, '1001010100010111': 3, '0010000010110110': 1, '0110010110110011': 2, '01010000011
00011': 1, '0100001000001000': 1, '1110011110010101': 1, '1000001001001100': 1, '010
1100100001100': 1, '0111101100111100': 1, '1000101011101101': 2, '0110010110000010':
4, '0100110101110101': 1, '1111100000111100': 2, '1110001101010111': 3, '10001010111

00110': 1, '0001101000011101': 2, '0110001111000110': 1, '0010001111111110': 1, '000
1010001100011': 4, '0011101011010000': 1, '0001101011011110': 1, '0001010110110111':
6, '0110110010100101': 1, '0001101001000001': 1, '0011110000111111': 1, '01111000100
00000': 1, '0110110100101001': 1, '1010100011010011': 1, '1011110100010001': 1, '111
0000010111011': 1, '1101111110110111': 1, '1001110010011101': 1, '1100001010011110':
4, '1110010100011111': 3, '1110110000010111': 4, '0001011100010001': 1, '00111000001
11101': 5, '0001011111000101': 2, '0111010101001001': 1, '1110100101101001': 2, '111
1000001100011': 1, '1100101001110111': 1, '0111100001101001': 1, '1001000001100010':
1, '0011101100101001': 2, '1100000110110111': 1, '1010000011011000': 1, '01010010010
11010': 1, '1010110100001101': 1, '1100011000110011': 3, '1100100100101000': 2, '001
1100101100010': 1, '0011010000110001': 2, '1010000111011000': 1, '1010101001101100':
3, '0011110100100101': 2, '1100001001001100': 2, '1100011101110001': 2, '11101010000
01010': 1, '0001100001100010': 2, '1010010000100111': 3, '1010011000100011': 1, '111
0100110010111': 1, '0111110100010011': 2, '1101001110001000': 1, '0001101110000110':
1, '1110001010011110': 1, '0110100100001000': 4, '0110100000000001': 1, '10101101011
10001': 1, '1010011001110111': 3, '1000011010101111': 1, '0001010111110111': 3, '001
1010100000010': 1, '1000111100110111': 2, '1110110011101100': 1, '1100001111000111':
1, '0011111011010101': 3, '1100001110010101': 2, '0011101100110111': 1, '01011011001
00010': 1, '1000000111001010': 3, '1110010110111110': 1, '1100010100100111': 1, '001
1110100001101': 1, '1100110010101101': 1, '1010110110110111': 1, '1110110101101101':
1, '1110011101001001': 1, '1010010011001011': 1, '0001111101100010': 1, '01001111010
11101': 3, '0101111110100101': 1, '1100000100010111': 1, '1000011011011110': 5, '110
0110111000011': 3, '0010010001111000': 1, '1100101010011101': 2, '0100001111001110':
3, '1000110101100001': 2, '1100101111001100': 2, '1100011100100101': 1, '10100000011
01100': 2, '0011100000010010': 1, '1110000000101100': 3, '1111011101000011': 1, '110
1111001100001': 2, '1011100101001001': 1, '1100011101100111': 4, '0001010100000011':
1, '1110100000110010': 2, '1011001010111111': 1, '0101111001000001': 3, '00011101011
01101': 1, '0111100110000111': 1, '0010000001101100': 1, '1001011010011110': 1, '111
0010111001010': 2, '1000001001001010': 2, '1100110010011101': 2, '0101101000001100':
1, '1100101001111101': 2, '1101001010110010': 1, '0100011100110111': 3, '10000101000
00010': 1, '0101011001000010': 4, '0011100110110110': 1, '0101011001000001': 1, '111
1100101000010': 1, '1100011010100101': 1, '1001101010110110': 2, '1110001011101110':
3, '0011011001101010': 3, '1110101100001100': 2, '1110110010111111': 1, '00010101101
11011': 1, '0101001011100000': 2, '1001111101010101': 1, '0010101001111100': 7, '111
0111001010111': 1, '1001111000111111': 1, '1000110111011101': 2, '0010010011000011':
2, '1010010111001111': 1, '0111010011010011': 3, '0001000111111110': 1, '11000111010
00111': 4, '0100111010010111': 2, '1110010101110101': 2, '1011000001111010': 2, '110
0010000100010': 2, '1100100011111100': 1, '0101100011100000': 1, '1001000110000010':
2, '1110110011110011': 2, '1101111000010111': 1, '0101101110011100': 1, '00010010101
10010': 2, '0100001110001010': 1, '0101100000010010': 1, '1000001101010010': 1, '111
0011100001111': 1, '1010110101110101': 2, '1100000111111110': 1, '0110110111111101':
3, '0111000011100011': 1, '0011010100111111': 1, '1110000100100111': 1, '01010110011
00001': 4, '0101001100011100': 1, '1011110111001101': 1, '0111101010001101': 1, '001
1110101011100': 1, '1010000011010110': 3, '0101110110010011': 1, '0011100010000000':
1, '0011101010011100': 1, '1111011110000110': 1, '1000101101000000': 1, '00111000011
00001': 1, '1111100100010101': 1, '1100011110000011': 1, '1000001010101010': 2, '010
1001000100111': 1, '1110101111001100': 1, '0111011001100111': 1, '1011010101001001':
1, '0011110010101100': 1, '1010010001010010': 1, '0011110110000111': 1, '11011010000
01100': 1, '0001001011110101': 1, '1111101111011000': 1, '0100000010110110': 1, '011
1110111110111': 2, '1000111111100101': 1, '0100101001110100': 1, '1000101010110101':
2, '0100111011101101': 2, '1011001001100010': 1, '1010010110111101': 2, '10001110100
11100': 1, '1001101111110101': 1, '0101110110000101': 2, '0011010011110110': 1, '001
0100101001001': 1, '1101100010110110': 2, '0011010111110110': 1, '1100001101101010':
1, '0001001010111111': 1, '1011000110011010': 2, '0010000001101000': 3, '00111111111
01000': 1, '1011110100010101': 2, '1010100110110111': 2, '0001011010001110': 1, '111
0010111001011': 1, '1010100100101010': 3, '0100111001100101': 1, '1110101101101100':

1, '0001000110000010': 3, '0110000101010111': 2, '0100101000000010': 1, '00001110101
11100': 1, '0110110011101101': 1, '0011110011000101': 2, '1110110101100011': 1, '110
1101100100000': 1, '0101000010110111': 3, '0100111101111101': 1, '1111111100100001':
1, '1100101000111100': 4, '0011010011010110': 1, '1111110010010111': 1, '10001111000
01101': 1, '0011100100110111': 1, '1111010101000111': 1, '0111100100000010': 1, '101
1101100011001': 1, '1101110110000011': 1, '1110101001111000': 2, '1110010011100010':
3, '0001000001110010': 1, '1010101000011100': 3, '1110111100000111': 1, '10111011000
01000': 2, '0011101111010110': 1, '1010101001001100': 2, '1101111000111001': 1, '001
1110010100111': 2, '1011110011010101': 2, '1010001101001000': 2, '1001101000001100':
1, '1001011111110011': 1, '1011010011110011': 2, '1011101000001000': 3, '01100100101
10110': 1, '1010101010111101': 2, '0000010011100111': 1, '0110110110000101': 1, '110
0101001110010': 2, '0001111001100001': 5, '1011011011110111': 2, '0110010000010111':
2, '0111100100101001': 1, '0111101010100110': 1, '0101101111111100': 2, '01110101001
00011': 3, '0110010100100111': 2, '1010001110001000': 1, '1110010111101110': 1, '010
0111110010111': 3, '0011011110000010': 1, '1011101010111110': 2, '0111011001000011':
1, '1110011001100011': 2, '1000001111010111': 1, '1110100001011001': 1, '01011100111
11100': 1, '1100100101010010': 1, '1011011101110111': 1, '0101111110111101': 1, '101
0101001111101': 1, '1000001111000010': 4, '1100011100101001': 1, '1010001100100010':
1, '0010100100001010': 2, '0101000001010100': 1, '0111111100111101': 2, '10001010110
10110': 2, '1001010010000011': 1, '0011010011111110': 3, '0101010011100011': 2, '010
0001100011010': 2, '1010100111001110': 2, '0111001100000010': 3, '1010101111001101':
1, '1010010100110111': 4, '1110110000001010': 2, '0011101101001010': 5, '01010100010
00011': 2, '0001111010111111': 1, '1101111110100011': 2, '1100001111001100': 1, '011
1101011101100': 1, '0001001101010111': 1, '1011111000001001': 2, '1000111000101100':
1, '1000001111000011': 1, '1010110010100101': 2, '1100111111000111': 4, '00011010101
00101': 1, '0111001110000110': 1, '1100111110111100': 1, '1110001101111100': 1, '000
1011100100011': 1, '0111100100010101': 2, '0100010100000111': 2, '1110001110010111':
1, '0110001100001010': 4, '1001011110011011': 1, '0111100111010100': 1, '00110000000
10010': 2, '0111011010100111': 1, '0001001001110111': 1, '0110010001100011': 2, '110
0100111101000': 2, '0111110001001001': 2, '1011110000011001': 1, '1110111011101101':
2, '1001101110011101': 2, '0000011111010011': 1, '0001111011011110': 1, '01010101101
00010': 1, '1100010110001101': 1, '1111010110000111': 3, '0001100000000001': 1, '011
1100100111000': 1, '0101101110110110': 6, '1110010011101000': 3, '0111001001001010':
1, '1010000110110110': 1, '1100010001011000': 2, '1001000110011110': 1, '10101001001
11100': 1, '0001100001101100': 1, '0000001111111110': 5, '0001001000011010': 3, '100
0001001110010': 2, '0101011100000010': 1, '0011011000001001': 2, '1010010101011000':
1, '1110100011001100': 3, '0110101100001000': 2, '1101011101100010': 1, '11000011001
00011': 1, '1111110011111101': 1, '1011000000000010': 1, '1010010101000011': 1, '000
1001010001000': 4, '0011111101010101': 2, '1110100011001110': 1, '0001011111100011':
1, '1100111010001101': 2, '1111110000011001': 1, '1111100110101000': 3, '01011110100
10011': 1, '0001011100001101': 1, '0101101100110101': 1, '0001011101011111': 1, '010
1001110111110': 3, '1010100010011101': 2, '0010001100001010': 2, '0110110100001000':
1, '0001110110000011': 4, '1110000100110111': 1, '0001011000011000': 1, '10111001100
11101': 2, '1001111011101101': 1, '1110100110010000': 1, '0101011110000110': 1, '001
1100111110011': 1, '0010100001011000': 1, '1000001101011001': 1, '0110110000100011':
3, '1011011110100011': 1, '1011110000110101': 2, '1010000100010111': 2, '10000000110
10110': 2, '0100011000010111': 2, '1110111011000011': 1, '1010010100001111': 1, '010
0101110010101': 1, '0111000100100010': 6, '1011100101101010': 1, '0011010011111010':
1, '0110010011101000': 2, '1101011011000011': 1, '1100111101110111': 7, '00010000110
10111': 1, '0100101110110101': 1, '1011000011101110': 1, '0100111100010111': 1, '001
0000000001011100': 2, '0001101010111000': 1, '0001110110011101': 1, '1100100001101001':
1, '0001111001001100': 1, '1110110111100101': 2, '1111000110001010': 1, '01111110101
10111': 2, '1100001010111110': 5, '0110000011110011': 1, '0100101101101000': 3, '111
0111001011001': 1, '1110100111011100': 4, '0101101101110001': 1, '1100000010110011':
1, '0100000000000010': 4, '0001100010000101': 1, '0101001000110100': 2, '11010000101
10110': 2, '1001010101000010': 1, '0011000001110011': 1, '0101010100110101': 1, '110

0001011111100': 1, '1110110001011000': 2, '0101001101110010': 3, '1011110100011001':
1, '0101101100110010': 1, '0001101010110111': 1, '0011100011101101': 1, '10101001110
01101': 1, '0011111000001101': 1, '0000101100001010': 1, '0101101001101010': 2, '010
1001100001000': 1, '1110111100100011': 2, '0011100110110111': 2, '1110011000001010':
1, '1000001001101100': 3, '1001100101101010': 1, '1010010101110111': 1, '11110001100
00011': 3, '0111000111000011': 1, '1110001110010010': 1, '1100011111011111': 3, '000
1110101001000': 2, '0000001101111100': 1, '0101001111000000': 1, '1001111100011001':
4, '1001011100110111': 2, '1010000011000011': 1, '1100110011111101': 1, '11011101000
10111': 1, '0011110010111000': 1, '1010101101011000': 1, '1100110111010011': 1, '111
0101101111000': 1, '0011010011100101': 1, '0110000011110111': 1, '1100101100000000':
1, '0000111001010101': 1, '1110001010110111': 1, '0101100000010100': 1, '01001110011
10001': 2, '1000011011001000': 2, '0110010001000001': 2, '0110100010010110': 1, '100
0011000011001': 1, '1110110110011100': 3, '1100001111001011': 1, '0011001011111010':
1, '1100001000000011': 1, '0100011101001001': 1, '0110000011100110': 1, '00011111010
01100': 1, '1100111001100111': 2, '0001000001010010': 1, '0001101110000011': 1, '001
1110110110011': 1, '1010000001100010': 2, '1000111100111101': 1, '0010000111101000':
1, '1110001011000010': 2, '0110100110101000': 2, '0011001010001110': 2, '00101011100
11100': 1, '0011010111001101': 1, '0011110110001010': 1, '0101011111000011': 4, '011
1010111011111': 1, '1110001011101000': 2, '0100011110011101': 1, '0101010100010011':
1, '0011000000111101': 1, '1011111100100001': 1, '0001101110010111': 1, '10111001010
00010': 1, '0101001010001110': 1, '0010000100111010': 1, '1100111111111101': 3, '101
0000101001100': 1, '0001001000111010': 2, '0001110110010011': 1, '1001011001100010':
1, '1100010001111101': 1, '1000001001101001': 3, '1101100011100000': 1, '10011111010
01000': 2, '1100110001010011': 1, '0001110010100101': 1, '0011110111010011': 1, '101
0010010101101': 1, '1110010011000010': 3, '0011000111001010': 4, '1010000111000011':
5, '1101111111010111': 1, '0001011010000010': 1, '1100100001100001': 2, '01001010110
10110': 1, '0011010110000110': 1, '1100110000100011': 2, '0100111111010011': 1, '000
1010100100011': 1, '0010100000100010': 1, '1011000011001000': 1, '0111111000110111':
1, '1110101110010100': 1, '0111110000011100': 1, '1010011111000111': 1, '00010000000
10010': 3, '0001110110111100': 1, '0001000001000010': 7, '1010100001100001': 1, '110
1011000110101': 1, '1000011111001000': 1, '0011000010011010': 2, '1011011111011110':
2, '1001111011001000': 1, '1100100000000010': 1, '0111000001111010': 1, '00011011010
11100': 1, '1010100011101110': 2, '1011011110001011': 2, '0001011100000011': 4, '010
1100110001000': 2, '0111111011100101': 2, '1011000111110110': 1, '1000111011111000':
1, '0001110110100011': 2, '0101101110100101': 1, '1000001010011100': 1, '10010110000
01100': 1, '0000011000010111': 1, '0101001010110011': 2, '1000110001011101': 3, '110
0000000110010': 2, '1000101101001010': 1, '1001010101100111': 1, '0001110010011100':
1, '1010001010001110': 1, '1110001100001000': 1, '1100111111101000': 1, '11101000010
11101': 2, '1101111100010001': 3, '1100010111011110': 1, '0100011000100001': 1, '100
0101000100010': 3, '1111100011100000': 1, '1100000001000000': 1, '1110001110110110':
1, '1110000101111010': 2, '1000111110000101': 1, '0011110110010101': 1, '00110111110
10101': 1, '1001110101000011': 1, '0000011101001001': 1, '0100100110010110': 1, '111
1000111010111': 1, '1011110010100011': 1, '1111100110000010': 1, '0001110011101011':
1, '0111010010111110': 2, '1010001101001100': 1, '1110010001000101': 1, '01011110011
10101': 2, '0110101100000010': 1, '1101010001110111': 1, '0001110110001101': 1, '101
0010001111000': 1, '1000110010010111': 2, '1011101000111000': 1, '0011101110111000':
1, '0011100100000100': 1, '0111111101001001': 1, '1011011010000111': 1, '11000010000
10111': 2, '0011010101110011': 1, '1001000100011100': 1, '0010101110001000': 2, '001
1010001101000': 1, '1001110010000011': 1, '1100010101100011': 3, '0000001011100010':
1, '1000111111010111': 1, '0001011101100101': 1, '0101000011110111': 1, '01010010111
10101': 1, '0010000011001010': 2, '0110110010110011': 3, '1011110100011000': 1, '010
0111101110001': 1, '1010010101011111': 4, '1110000111110010': 1, '0011000011011010':
1, '1111110100010101': 4, '1010011001001001': 1, '1110101010010101': 2, '10010001100
10110': 3, '0011000101100011': 1, '0001100010111000': 1, '1010110100000001': 3, '101
1110111001000': 2, '0110011000110111': 1, '1110101001100010': 1, '0100101010001000':
3, '1010110000110111': 2, '1111111110000011': 1, '1100011000101111': 1, '01110111101

11101': 1, '1100111100010001': 1, '0111110000110010': 1, '1101101110001000': 1, '100 0001100000011': 1, '0001000001001010': 5, '0111001001100111': 1, '0001011110001110': 1, '0011000001010111': 1, '0001100000100010': 1, '1011001000111010': 2, '11101110001 10111': 1, '1100111010000000': 1, '0101111000010111': 2, '0001011101111111': 2, '001 1100100010000': 1, '0010100111011110': 2, '1011010010110011': 2, '1110111000111101': 1, '1110000110110111': 2, '1111010010000010': 1, '1110100110010100': 2, '11111110111 10101': 1, '1100110001100101': 2, '1100110001111000': 1, '0010010011000111': 1, '110 0011101110011': 2, '0101001001100111': 2, '1010000101111010': 2, '1101111000010101': 1, '0011000000001100': 1, '0101111110010011': 2, '0101010110000101': 1, '10100100100 10111': 2, '1010011100011111': 1, '1100001011010010': 1, '0011011110001110': 1, '001 1000000111111': 1, '0011101010101110': 1, '0011101010001110': 1, '1110010110000011': 1, '0011011100011101': 2, '1001011110110111': 1, '1100100111100010': 2, '10111101000 10111': 1, '1011010110001011': 2, '1001110001101001': 1, '1111010010110011': 1, '111 0110000011101': 1, '1010110101001101': 3, '0101001010101110': 2, '1010110101110111': 1, '1011011110010111': 1, '0011011101001010': 3, '1010010000011010': 1, '00111001000 00000': 3, '1011111000011101': 1, '1110111110111101': 3, '1110111100000001': 1, '111 0110010110011': 1, '1110011011100111': 4, '0001101110111101': 2, '0011111000110111': 1, '0110001100101010': 1, '0111110010100110': 1, '1111001101100010': 1, '01010010111 10011': 1, '0110000011100010': 6, '0011101011110010': 1, '1100001110110011': 1, '110 0110111010111': 1, '1010111011101101': 2, '0011010111001000': 1, '1000111000001000': 1, '1001101100111001': 1, '0010110010110101': 1, '0111010110001010': 1, '10111011101 11110': 1, '1000111100000001': 2, '1010111001110111': 1, '1011111101001001': 1, '101 0011001111001': 1, '1001111110110111': 1, '0001110100111100': 1, '0111000001010111': 2, '0101111001100011': 2, '0100011010101011': 1, '1010010001100010': 2, '10001100101 11000': 1, '0111111100110101': 1, '1010011111001111': 1, '0101000010110010': 1, '001 1110010110101': 2, '1110000101010100': 1, '0110110101111100': 1, '0101111010000111': 1, '0001101110001101': 2, '0101011100110001': 1, '1110111111000011': 2, '00111010011 01001': 1, '0111010110111110': 1, '0100101001100010': 1, '1011110011100101': 1, '100 0110001011001': 1, '1100011100110010': 1, '0001010001000001': 1, '0111000000010010': 3, '1100001011001000': 4, '0011110100101100': 2, '1010111001110101': 1, '01001100101 00101': 1, '0001110100110111': 1, '0001001001001100': 1, '1100111010111000': 1, '001 1111010110111': 2, '0101000010010011': 1, '1011000001100011': 1, '0110000011111010': 1, '1010110100101000': 1, '1110110000100111': 1, '1100111010110011': 1, '01010011011 00011': 1, '0001010100100001': 1, '1110010000010011': 3, '0101101100110001': 1, '000 1011101011011': 1, '0101011100110100': 1, '0010110110011000': 1, '0111101100010010': 1, '0110110110001000': 1, '1110101001100001': 1, '1010010111000111': 2, '10100100100 10011': 1, '1110000001111111': 1, '1001010001110111': 1, '0010001100101010': 2, '100 0011101111001': 2, '0011111010100011': 1, '1000100111011110': 1, '1010100100100010': 1, '0001100010000110': 1, '1110111001101000': 2, '0001100000001000': 1, '01100010100 11000': 1, '0100010011010111': 2, '1111110011100101': 1, '0011100010110111': 1, '110 0011001110010': 1, '1110100011010111': 1, '0100001011000011': 1, '1000001101001001': 3, '1111100010110110': 2, '0000001011001010': 1, '0111000000101000': 1, '01101001111 11110': 1, '1000010001110011': 1, '1110100100101010': 4, '0001111101000011': 1, '000 1111111010011': 2, '1101000101100010': 1, '1100011111100010': 1, '0100111101000100': 1, '0011010011101101': 1, '1001100000101000': 3, '1110010011010101': 1, '01111111010 00001': 1, '1100010001000011': 1, '1010110011010111': 1, '0010110101011101': 2, '111 0100100010101': 1, '0001111110100101': 2, '0001111100010100': 1, '0101111100111100': 1, '0111010011111101': 1, '0010111000001101': 1, '0110100110110110': 1, '00010000000 11100': 1, '1100101001100100': 1, '0111000100011100': 2, '1010000010010110': 2, '001 1011001100111': 1, '0110100010110101': 2, '1000011101111100': 1, '0101111100101101': 1, '1001001001101000': 1, '0111110010011101': 1, '1110010010101011': 1, '10111011101 10111': 1, '0011100100100000': 2, '0110010000000010': 1, '1100101100110010': 1, '000 1011110111010': 1, '1101111100011001': 1, '0110010010110101': 1, '0011101100011101': 1, '0000011001111101': 1, '0101111000011101': 1, '0000100101111100': 1, '10100001110 00010': 1, '0100010100010111': 1, '1110000100000011': 1, '1001100101010001': 1, '000 0111110001000': 1, '0001001101011100': 1, '1001000011111110': 1, '0010111001111101':

2, '1100111011111110': 1, '0111110100011001': 1, '0011011110000111': 1, '00010101001 01001': 2, '1001011011010111': 1, '1110001011110111': 1, '0111001101001000': 1, '010 1011001010001': 1, '1100011001111001': 1, '0100001011001000': 2, '00000110110000011': 1, '0010010110010111': 1, '1111000110100010': 2, '1000111110010111': 1, '11100001011 10001': 2, '1110000101010101': 1, '0001111001110001': 1, '0001111100011000': 1, '111 0011111011110': 2, '1101101000111100': 1, '0100100001111100': 1, '0000111110011110': 1, '0110000111100010': 1, '0111100111000101': 1, '1110010001110010': 2, '11101010101 11110': 1, '0111110000110011': 1, '0001001111111000': 1, '0100110101100001': 3, '000 1110000101000': 1, '1100101101100000': 2, '1100010101000011': 3, '0101100111010100': 1, '1101001011001000': 1, '1001011100110010': 1, '0110001110010110': 1, '10000111011 00010': 1, '1110111000101000': 1, '0011110110111011': 1, '0011000010010011': 1, '111 0100110100101': 1, '1110000001100000': 1, '1100000100000001': 1, '1110010001101000': 1, '0101010010100110': 1, '0011100010101011': 1, '1101000010010110': 2, '01001101010 11101': 1, '1100100100010100': 1, '1010111010110111': 1, '1100111111001011': 1, '011 0100110110100': 1, '1100010100010011': 1, '0111111010111111': 1, '1000011001100111': 1, '1110110101001101': 3, '1110100011001101': 1, '1100000100110111': 2, '01111000101 10111': 1, '1110100011101101': 1, '0010010010010101': 1, '1110011101011001': 1, '110 0111111111000': 1, '0100101110011110': 1, '0000011100011010': 1, '1010110100011111': 1, '1110011101110001': 1, '1010100011011000': 1, '1110110100001010': 2, '10011100000 01001': 1, '1010110110010011': 1, '1011000110101010': 2, '1110111011111101': 3, '000 1011000011111': 1, '1010000010101010': 2, '1000011100111111': 1, '0000111001001100': 1, '1110001111010011': 1, '1011010011001101': 1, '1001110010101000': 1, '10100100011 01100': 1, '1010011011101101': 1, '0101011010000010': 1, '1100011101000101': 1, '110 1001100110010': 1, '0100011110010110': 1, '0001101111101100': 1, '1010100001011111': 1, '1000001001100010': 1, '1010000000001000': 1, '0101011011111100': 1, '00110101001 10001': 1, '0111110101010001': 1, '0111110000100101': 3, '1000011011110011': 1, '011 1100010011110': 1, '1100100101000000': 1, '0110001010110110': 1, '0101100100010100': 1, '1000100110001000': 1, '0101110100000111': 1, '0101101000010010': 1, '10000110110 01101': 1, '0011000100001101': 1, '0101110100110111': 1, '1011000010101110': 1, '100 0000001001000': 1, '0011000101000011': 1, '0111001111011100': 1, '0110010110010101': 1, '0011100100001010': 1, '1110010111100110': 1, '1010101010101100': 1, '01111001100 10100': 1, '0100110001010111': 1, '1100001010111100': 1, '0010010101110111': 1, '011 1110011101000': 2, '0001110100111001': 1, '1100110011101000': 1, '0000000101000010': 1, '1111100011111101': 1, '0100111011110111': 1, '0011111101000001': 1, '10100101010 10011': 1, '1100100001000010': 1, '1110011101111001': 1, '0011010000000010': 1, '110 1000010100110': 1, '0011100001110101': 1, '0011101101000010': 1, '1000001010100011': 1, '1010001110010110': 1, '1100011101111101': 1, '0111000101000000': 1, '10000100000 00011': 1, '0111001110100110': 1, '0101011111111101': 1, '1001111100100011': 1, '100 1110000000001': 1, '0011011011011101': 1, '0000001111101110': 1, '0011110010111111': 1, '0111111000110001': 1, '0110000011101110': 1, '0010010111011110': 1, '11000110010 00111': 4, '0011011110011011': 1, '0100011001111101': 1, '1100000111000111': 1, '110 0000010011110': 1, '1110010110001000': 2, '1110100110110100': 1, '1010111101000001': 1, '0101001011101000': 1, '1100101001000100': 1, '0011100100111001': 1, '00110011101 00011': 1, '0100011000100010': 1, '1010100001110100': 1, '1000110101010001': 1, '101 0110010101001': 1, '0010010110010101': 1, '0000001001101000': 1, '1110000000000111': 1, '0011000010001011': 1, '1100111011101011': 1, '0111000011010010': 1, '01100101001 10101': 1, '0101000010000011': 2, '0001001011001010': 1, '1100000001100000': 1, '100 1100000100001': 1, '1101010110010110': 1, '0111111100110111': 1, '1000001011000010': 1, '0110010001111001': 1, '1111110000110111': 1, '1111001011110110': 1, '00111011000 11010': 1, '1100001110111110': 1, '0101001101101010': 1, '1001011111010011': 2, '001 1101110010110': 1, '1010010001010011': 1, '0011001000110010': 1, '0011000011010010': 1, '1000010001110101': 1, '0011111000110100': 1, '0100111110000101': 1, '10111011101 01000': 2, '1000101101000001': 1, '1010001000011010': 1, '1100011110001010': 1, '010 1010000100011': 1, '0110110011110011': 1, '1110000001101010': 1, '1010010111010011': 3, '0001010010010110': 1, '0111011011010101': 1, '0101010011110101': 2, '01110010101 10111': 1, '1100100010010110': 1, '0010010011101011': 1, '0110111101011001': 1, '001

0111000101000': 1, '0110001001011100': 1, '1101111010100111': 1, '1100100101100000': 1, '1011011101001000': 1, '1100001101011000': 2, '0011000111000110': 1, '1100100111001110': 1, '1010101111011000': 1, '0000000001010010': 1, '1110110011000101': 1, '1000001010001000': 1, '1111000110100110': 1, '1110111110001000': 2, '1100101111100011': 1, '0001101000011001': 2, '1100010101100001': 1, '0001011100111100': 1, '0110010001110010': 1, '1011110000001000': 1, '1010000001110111': 1, '1001001010100110': 1, '1000011111101000': 1, '1001001110001000': 1, '1101111111110011': 1, '0010010111010110': 1, '0110110100001010': 1, '0110110011000110': 1, '1000001010111010': 1, '0101010001100010': 2, '1010010101100111': 1, '0100001111010011': 1, '1011010000000001': 1, '1011000100100010': 1, '0001010011010110': 1, '1011000010010111': 1, '1010111111111101': 1, '1010101101011101': 1, '0110010100001010': 1, '1001111101000010': 1, '1110000111000111': 1, '0011101110111100': 1, '1110100001110001': 1, '1110011111011111': 1, '0011001110110110': 1, '0101000010010010': 1, '0101111110001101': 1, '1000110110001000': 2, '1111111000101001': 1, '1010001101001010': 1, '0001001010011010': 1, '0001010100110101': 1, '0111101010001000': 1, '1000001101001010': 2, '0011101000010111': 1, '1100001110110100': 1, '0010010111111110': 1, '1100100101110100': 2, '0100011101010101': 1, '0101000001010111': 1, '0001110010011101': 1, '1001011110111110': 1, '1000111001010001': 1, '1101111011111101': 1, '0001110100011001': 1, '1110001010111110': 1, '1110100000111000': 1, '0000001011101110': 2, '1001010111010111': 2, '0111010111100011': 2, '0011011010100111': 1, '1001001001111010': 2, '1110100111111100': 2, '0101001101001000': 2, '0010100100101010': 1, '1110111011111111': 1, '1001011110000010': 1, '0001001011010111': 1, '1100010101001000': 1, '1100111110110011': 2, '1110111110111100': 1, '1010100010011101': 1, '0100011110010011': 1, '0010100110011000': 1, '0010000001001100': 1, '1100101010010111': 1, '0001010111010101': 1, '0100101110010100': 1, '1000011010110101': 1, '0011111011001101': 1, '1111110100110111': 1, '0001011010101000': 1, '1010000001101001': 1, '0101101100000100': 1, '0111010001101010': 1, '0100011100100111': 2, '0110110101001000': 1, '1000010111011101': 1, '1110010011001011': 1, '1001111010111100': 1, '1100000110010111': 1, '1100100001000000': 1, '0110110010110111': 2, '1110000010111010': 1, '0111111010110011': 1, '1000011010110011': 1, '1110100011100110': 1, '0111001110101110': 1, '1110101101011010': 1, '0100111011110011': 1, '1010110111001100': 1, '0001100111011100': 1, '0111100111110110': 2, '0001110101101010': 1, '0001001011110011': 1, '1110011101010011': 1, '1010111011111111': 1, '0100110001001001': 1, '1100000001010111': 1, '1000101011111010': 1, '1010110111011111': 1, '0010010101111101': 1, '0011111111110101': 1, '1011010001101010': 1, '1001100100010100': 1, '1110101001010100': 1, '1010000101111101': 1, '0011011010111110': 1, '1110101011110110': 1, '1010010101000111': 1, '0001011001101111': 1, '0011101101001001': 1, '1100010001110010': 1, '0011100000000000': 1, '1110010001011010': 1, '1100110100100001': 3, '1000010110011101': 1, '1000101111001100': 2, '1001101110111010': 1, '0100001111010111': 1, '1101101111010101': 1, '1111100000100010': 1, '1010001000111100': 1, '1010111111101101': 1, '1011110010101011': 1, '0100100101110010': 1, '0101011000110011': 2, '0001010010000111': 1, '0001001010101011': 1, '1001010100000011': 1, '0001010110001110': 1, '1001001010000110': 1, '1100001110000000': 1, '0001100010000011': 1, '1100101000000000': 1, '1100111110110110': 1, '1000111101001100': 1, '0011000010110011': 1, '1001011001100011': 3, '0011100111101100': 1, '1011000010001000': 1, '0101111101110001': 2, '1101011001001010': 1, '1100100011010110': 1, '0001001010100111': 1, '0110000000110010': 1, '0101100010100101': 1, '1010010111111110': 1, '0001001100001001': 1, '0000110001010001': 1, '1010110000111010': 1, '0101001011010011': 1, '1011010010010011': 1, '1000110001000001': 1, '1000011100011010': 1, '0110110010010011': 1, '0101101000000100': 1, '1000011011101111': 1, '1110001100010010': 1, '0110001111001110': 1, '1011001100110010': 1, '1111010101100111': 1, '0100011000100111': 1, '0101110011100101': 2, '1011001011110110': 1, '0010100010111000': 1, '0010111001111001': 1, '0101011010100101': 1, '0001101111001101': 1, '0001110100000111': 1, '1100110011000011': 1, '1101111000011101': 1, '1000101110000101': 1, '0110100110000000': 1, '1010010100111111': 2, '1001001010101110': 1, '0001010101110010': 1, '0111000000010100': 1, '0011010011101000': 1, '1010110100101100': 2, '1110000110001010': 1, '1101100100111000': 1, '0010100110101101': 1, '0011110101101000': 1, '1110010011001110': 1, '0100111101

01000': 1, '1000010000110111': 1, '0011111100011000': 1, '0100111100000011': 1, '000
1101100111010': 1, '1111000011011110': 1, '1100111000101100': 1, '0100000001011100':
1, '1110111011101000': 1, '1100010011010110': 1, '1000001000100011': 1, '11100011010
10010': 1, '1101010111110101': 1, '1100111100110010': 1, '0011011011110101': 1, '101
0000111010010': 1, '1100011010110010': 1, '0101101010000010': 1, '1111000111110111':
1, '0011100110111101': 1, '1000000110011101': 1, '0001111111100101': 1, '11001101100
00101': 1, '0001000111110010': 1, '1110110111010010': 1, '1110101110010101': 1, '110
0000110001010': 1, '1111010110100101': 1, '1101101110100010': 1, '1011010000010111':
1, '1100010000001001': 1, '0011000011110010': 1, '0010010101110101': 1, '00011000000
01100': 1, '0000111101000001': 1, '1010101100001001': 1, '1000000011001010': 2, '100
0010100010011': 1, '1010000011001100': 1, '0111100100110100': 1, '1011111000100001':
1, '0110100010011100': 1, '1000011011000010': 1, '0100110110111101': 1, '10010010001
00010': 1, '1010000110111101': 1, '0010100000001010': 1, '0001011010011101': 1, '101
1010110100111': 1, '0100101111010110': 1, '1010101110111100': 1, '1010001111101000':
1, '0101100000100010': 2, '0001001101110111': 1, '1010000010001100': 1, '01100010011
00010': 1, '1110101101000001': 1, '0001000100001000': 1, '0111010011000011': 1, '101
1110100111001': 1, '0010000011001110': 2, '1110100111011000': 1, '1000100000101100':
1, '1110011100001001': 1, '1100011111100101': 1, '0101011010000110': 1, '10101100001
11100': 1, '0110011000101010': 1, '0000110111001000': 1, '1110000110001000': 1, '011
0110110101000': 1, '0111110100111100': 1, '0111000110000101': 1, '1110101111001010':
1, '0011111100001101': 1, '0111110110111101': 1, '1001011100011100': 1, '01101000111
10110': 1, '0111000000110101': 1, '0001011000110001': 1, '1010110000001101': 1, '111
0000101111111': 1, '1011100111111101': 1, '1000010101001001': 1, '1001101100010100':
1, '0101101110100110': 1, '1010010010111100': 1, '0001010010111110': 1, '11101010101
10110': 1, '1100101101110101': 1, '0000101011001000': 1, '0101011111001000': 1, '100
1101010001110': 1, '0001011000000001': 1, '0001001110110111': 1, '0101011101100010':
1, '1010100011111010': 1, '0011111011110111': 1, '1110101101001100': 1, '11100010010
01000': 1, '1000000101001100': 1, '0100111000100001': 1, '0010101010011100': 1, '110
0100101101000': 1, '0010000101101010': 1, '1011101111011100': 1, '0101000111010101':
1, '1110101100101100': 1, '0110100000101100': 1, '1010101100101001': 1, '11111110001
00001': 1, '0111011110011110': 1, '1100011011110010': 1, '1100110010000101': 1, '110
0001110110010': 1, '0010010010111101': 1, '0011100011010110': 1, '0100101001101010':
1, '0000010110011101': 1, '0101010100100011': 1, '1110010011101010': 1, '10010110111
11101': 1, '0001011110001101': 1, '0011100001110100': 1, '0101110010100111': 1, '111
0000001000001': 1, '0111001101010010': 1, '0111111001101001': 1, '0011000010111111':
1, '1100110111111101': 1, '1101000011000000': 1, '1110010100000101': 1, '00010010110
00010': 1, '1010110011011100': 1, '0111000000000001': 1, '0011101111011110': 1, '100
0110111100011': 1, '1000011100000111': 1, '1010100010100000': 1, '0011100000101101':
1, '0011100010001110': 1, '0101101101001010': 1, '0101010110110011': 1, '11000011100
11000': 1, '0011010001101101': 1, '1001001100000010': 1, '1001000011110010': 1, '001
1011100011001': 1, '0001111001010111': 2, '0011011000100001': 1, '1100101011000110':
1, '1110000101000001': 1, '1100111010011000': 1, '1110011100001011': 1, '00011110100
11110': 1, '0010100001111101': 1, '1101000111110110': 1, '1001101100000001': 1, '101
0000100101100': 1, '0001001011100010': 1, '1100101100010111': 1, '0110110111110111':
1, '0010010001010111': 1, '0110101101111100': 1, '0100011110010101': 1, '00001110010
01101': 1, '1000001110111100': 1, '1100100111011101': 1, '0111101100000010': 1, '101
1010010000111': 1, '0101001000100011': 1, '0001001111111010': 1, '0001011110011010':
1, '0111110101100011': 1, '1000001001011000': 1, '1100000011101010': 1, '01111101100
11110': 1, '1000001100010111': 1, '0011010000110011': 1, '0100001010110011': 1, '010
0011001100001': 1, '1001011110110011': 1, '1110110001001100': 1, '1100001101000011':
1, '0001100110000011': 1, '0111110010100010': 1, '0011000010010111': 1, '00000111010
11101': 1, '0000110010011110': 1, '0110000001010111': 1, '1111111100010101': 1, '101
0011101010111': 1, '0101001110110011': 1, '0001001001100111': 1, '1000111011000101':
1, '1000110000100001': 1, '0101000110100110': 1, '1110110000010001': 1, '11110101000
10001': 1, '0110010111000010': 1, '1100111100100111': 1, '1010001101111010': 1, '110
0101000110010': 1, '0111110111011100': 1, '0000011110010111': 1, '1100101011110011':

```
1, '1000110011111101': 1, '0111100110000000': 1, '1010001000000010': 1, '11001011011
10010': 1, '0101100110010101': 1, '0100011011010011': 2, '0001001010110011': 1, '111
0110010111000': 1, '1111110110110111': 1, '0101101110001101': 1, '1010010101000001':
1, '0001011110000101': 1, '0011100000001101': 1, '1100010001100101': 1, '11100100110
11111': 1, '0001101000100010': 1, '1000001111101011': 1, '1001011110001110': 1, '101
0010110101011': 1, '0000000101011010': 1, '1110100110110000': 1, '0001111110111010':
1, '0101000101100011': 1, '1110100111111000': 1, '1010011111100011': 1, '11000110010
11100': 1, '0111000011110100': 1, '0101101111010010': 1, '0000110001110101': 1, '001
0010100101001': 1, '1001111100111001': 1, '1100001011010011': 1, '0001100000011000':
1, '1100110010010011': 1, '1110101110111000': 1, '0011110001001101': 1, '11001010110
00000': 1, '0111010110000110': 1, '0100010111110011': 1, '0101001100001001': 1, '000
1100001110010': 1, '0001011110010010': 1, '0001101011000101': 1, '1010100100000010':
1, '0111100001100011': 1, '0010110111010111': 1, '1110100101011010': 1, '11110101011
10111': 2, '1011000111111110': 1, '0111001000000010': 1, '1000001111100110': 1, '111
0111111101000': 1, '1011011001110111': 1, '0000011011111101': 1, '0111000001000011':
1, '0011000111001011': 1, '0001010111011011': 1, '1100111001100011': 1, '11010010100
11110': 1, '0111100111110101': 1, '0001100110100011': 1, '0110001000000010': 1, '011
1100010101101': 1, '1111100111001000': 1, '0111001111110110': 1}
```

```
In [80]:  interpret_solution(graph, best_bs)
          print("Cut value: "+str(compute_cut_size(graph, best_bs)))
          print(graph, best_bs)
```
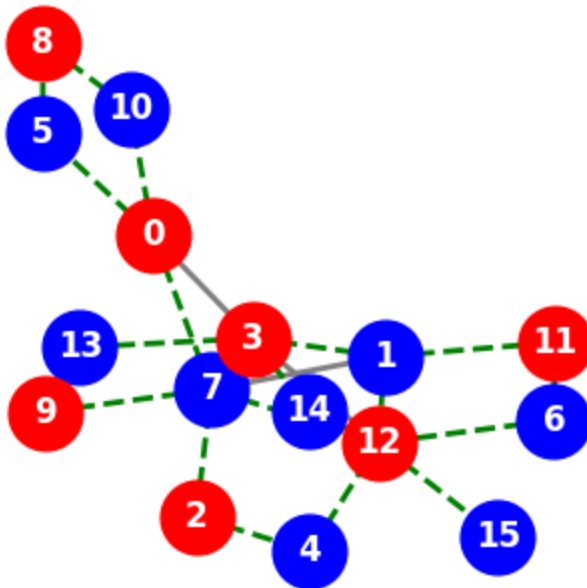


```
Cut value: 20
Graph with 16 nodes and 23 edges 1011000011011000
```

Drumroll please... the scores!

```
In [81]:  %%time
          # Brute-force approach with conditional checks

          verbose = False

          G = graph
          n = len(G.nodes())
```

```python
w = np.zeros([n, n])
for i in range(n):
    for j in range(n):
        temp = G.get_edge_data(i, j, default=0)
        if temp != 0:
            w[i, j] = 1.0
if verbose:
    print(w)

best_cost_brute = 0
best_cost_balanced = 0
best_cost_connected = 0

for b in range(2**n):
    x = [int(t) for t in reversed(list(bin(b)[2:].zfill(n)))]

    # Create subgraphs based on the partition
    subgraph0 = G.subgraph([i for i, val in enumerate(x) if val == 0])
    subgraph1 = G.subgraph([i for i, val in enumerate(x) if val == 1])

    bs = "".join(str(i) for i in x)

    # Check if subgraphs are not empty
    if len(subgraph0.nodes) > 0 and len(subgraph1.nodes) > 0:
        cost = 0
        for i in range(n):
            for j in range(n):
                cost = cost + w[i, j] * x[i] * (1 - x[j])
        if best_cost_brute < cost:
            best_cost_brute = cost
            xbest_brute = x
            XS_brut = []
        if best_cost_brute == cost:
            XS_brut.append(bs)

        outstr = "case = " + str(x) + " cost = " + str(cost)

        if (len(subgraph1.nodes)-len(subgraph0.nodes))**2 <= 1:
            outstr += " balanced"
            if best_cost_balanced < cost:
                best_cost_balanced = cost
                xbest_balanced = x
                XS_balanced = []
            if best_cost_balanced == cost:
                XS_balanced.append(bs)

        if nx.is_connected(subgraph0) and nx.is_connected(subgraph1):
            outstr += " connected"
            if best_cost_connected < cost:
                best_cost_connected = cost
                xbest_connected = x
                XS_connected = []
            if best_cost_connected == cost:
                XS_connected.append(bs)
        if verbose:
            print(outstr)
```

```
CPU times: total: 8.97 s
Wall time: 19.8 s
```

In [82]:
```python
# This is classical brute force solver results:
interpret_solution(graph, xbest_brute)
print(graph, xbest_brute)
print("\nBest solution = " + str(xbest_brute) + " cost = " + str(best_cost_brute))
print(XS_brut)

interpret_solution(graph, xbest_balanced)
print(graph, xbest_balanced)
print("\nBest balanced = " + str(xbest_balanced) + " cost = " + str(best_cost_balan
print(XS_balanced)

interpret_solution(graph, xbest_connected)
print(graph, xbest_connected)
print("\nBest connected = " + str(xbest_connected) + " cost = " + str(best_cost_con
print(XS_connected)
plt.show()
```
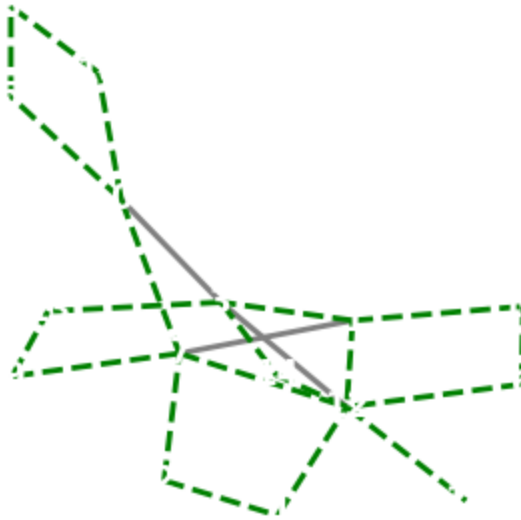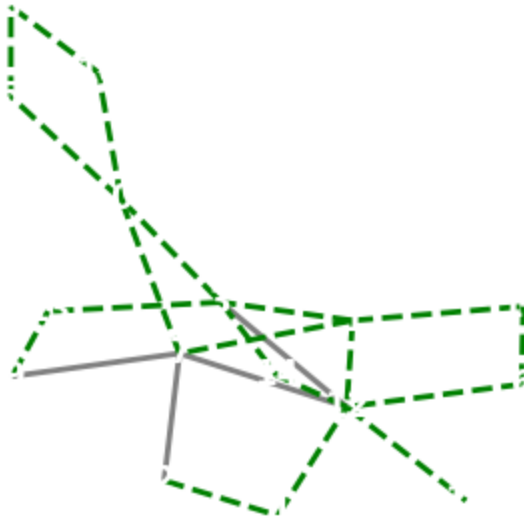


```
Graph with 16 nodes and 23 edges [1, 0, 1, 1, 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0]

Best solution = [1, 0, 1, 1, 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0] cost = 20.0
['1011000011011000', '0011010001111000', '1100101110000111', '0100111100100111']
```
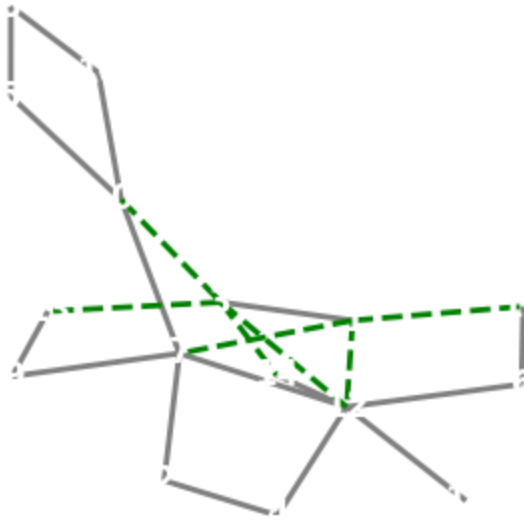
Graph with 16 nodes and 23 edges [0, 0, 1, 1, 0, 1, 0, 1, 0, 1, 1, 1, 1, 0, 0, 0]

Best balanced = [0, 0, 1, 1, 0, 1, 0, 1, 0, 1, 1, 1, 1, 0, 0, 0] cost = 19.0
['0011010101111000', '0001110101111000', '1110001011001100', '1110000011011100', '00
11010100111100', '0001110100111100', '1110001011001010', '1110000011011010', '110010
1110000110', '0100111100100110', '1110001010001110', '1110000011001110', '1110000010
011110', '1010000011011110', '0101111100100001', '0001111101100001', '00011111001100
01', '0001110101110001', '1011000011011001', '0011010001111001', '0001111100100101',
'0001110100110101', '1110001011000011', '1100101011000011', '0001111100100011', '000
1110100110011', '1110001010000111', '1100101010000111']

Graph with 16 nodes and 23 edges [0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]

Best connected = [0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0] cost = 7.0
['0101000000000000', '0100000100000000', '0110000100000000', '0110100100000000', '0100000101000000', '0110000101000000', '0110100101000000', '1101010010100000', '1100010110100000', '1110010110100000', '1110110110100000', '1100010111100000', '1110010111100000', '1110110111100000', '0101000000010000', '0101001000010000', '0100000100010000', '0110000100010000', '0110100100010000', '0100001100010000', '0110001100010000', '0110101100010000', '0100000101010000', '0110000101010000', '0110100101010000', '0100001101010000', '0110001101010000', '0110101101010000', '1101010010110000', '1101011010110000', '1100010110110000', '1110010110110000', '1110110110110000', '1100011110110000', '1110011110110000', '1110111110110000', '1100010111110000', '1110010111110000', '1110110111110000', '1100011111110000', '1110011111110000', '1110111111110000', '0101000000000100', '0101000001000100', '0100000101000100', '0110000101000100', '0110100101000100', '1101010010100100', '1101010011100100', '1100010111100100', '1110010111100100', '1110110111100100', '0101000000010100', '0101001000010100', '0101000001010100', '0101001001010100', '0100000101010100', '0110000101010100', '0110100101010100', '0100001101010100', '0110001101010100', '0110101101010100', '1101010010110100', '1101011010110100', '1101010011110100', '1101011011110100', '1100010111110100', '1110010111110100', '1110110111110100', '1100011111110100', '1110011111110100', '1110111111110100', '0101000000000010', '1101010010100010', '0101000000010010', '0101001000010010', '1101010010110010', '1101011010110010', '0101000000000110', '0101000001000110', '1101010010100110', '1101010011100110', '0101000000010110', '0101001000010110', '0101000001010110', '0101001001010110', '1101010010110110', '1101011010110110', '1101010011110110', '1101011011110110', '0010100100001001', '0010101100001001', '0010100101001001', '0010101101001001', '1010110110101001', '1010111110101001', '1010110111101001', '1010111111101001', '0010101100011001', '0010101101011001', '1010111111011001', '1010111111111001', '0010100101001101', '0010101101001101', '1010110111101101', '1010111111101101', '0010101101011101', '1010111111111101', '0001000000001011', '0001100000001011', '0011100000001011', '0001001000001011', '0001101000001011', '0011101000001011', '0010100100001011', '0010101100001011', '0010100101001011', '0010101101001011', '1001010010101011', '1001110010101011', '1011110010101011', '1001011010101011', '1001111010101011', '1011111010101011', '1010110110101011', '1010111110101011', '1010110111101011', '1010111111101011', '0001001000011011', '0001101000011011', '0011101000011011', '0010101100011011', '0010101101011011', '1001011010111011', '1001111010111011', '1011111010111011', '1010111110111011', '1010111111111011', '0001000000001111', '0001100000001111', '0011100000001111', '0001001000001111', '0001101000001111', '0011101000001111', '0001000001001111', '0001100001001111', '0011100001001111', '0001001001001111', '0001101001001111', '0011101001001111', '0010100101001111', '0010101101001111', '1001010010101111', '1001110010101111', '1011110010101111', '1001011010101111', '1001111010101111', '1011111010101111', '1001010011101111', '1001110011101111', '1011110011101111', '1001011011101111', '1001111011101111', '1011111011101111', '1010110111101111', '1010111111101111', '0001001000011111', '0001101000011111', '0011101000011111', '0001001001011111', '0001101001011111', '0011101001011111', '0010101101011111', '1001011010111111', '1001111010111111', '1011111010111111', '1001011011111111', '1001111011111111', '1011111011111111', '1010111111111111']

In [83]:
```python
# And this is how we calculate the shots counted toward scores for each class of th

sum_counts = 0
for bs in counts:
    if bs in XS_brut:
        sum_counts += counts[bs]

print(f"Pure max-cut: {sum_counts} out of {shots}")
```

```
        sum_balanced_counts = 0
        for bs in counts:
            if bs in XS_balanced:
                sum_balanced_counts += counts[bs]

        print(f"Balanced max-cut: {sum_balanced_counts} out of {shots}")

        sum_connected_counts = 0
        for bs in counts:
            if bs in XS_connected:
                sum_connected_counts += counts[bs]

        print(f"Connected max-cut: {sum_connected_counts} out of {shots}")
```

```
Pure max-cut: 1 out of 100000
Balanced max-cut: 169 out of 100000
Connected max-cut: 28 out of 100000
```

In [84]:
```python
def final_score(graph, XS_brut,counts,shots,ansatz,challenge):

    if(challenge=='base'):
        sum_counts = 0
        for bs in counts:
            if bs in XS_brut:
                sum_counts += counts[bs]
    elif(challenge=='balanced'):
        sum_balanced_counts = 0
        for bs in counts:
            if bs in XS_balanced:
                sum_balanced_counts += counts[bs]
        sum_counts = sum_balanced_counts
    elif(challenge=='connected'):
        sum_connected_counts = 0
        for bs in counts:
            if bs in XS_connected:
                sum_connected_counts += counts[bs]
        sum_counts = sum_connected_counts


    transpiled_ansatz = transpile(ansatz, basis_gates = ['cx','rz','sx','x'])
    cx_count = transpiled_ansatz.count_ops()['cx']
    score = (4*2*graph.number_of_edges())/(4*2*graph.number_of_edges() + cx_count)

    return np.round(score,5)
```

In [85]:
```python
print("Base score: " + str(final_score(graph,XS_brut,counts,shots,ansatz,'base')))
print("Balanced score: " + str(final_score(graph,XS_brut,counts,shots,ansatz,'balan
print("Connected score: " + str(final_score(graph,XS_brut,counts,shots,ansatz,'conn
```

```
Base score: 1e-05
Balanced score: 0.00135
Connected score: 0.00022
```

In [86]:
```python
# calculate our version of the score for the final solution
print("Base score: " + str(final_score(graph,XS_brut,counts,shots,ansatz_H,'base'))
```

```
print("Balanced score: " + str(final_score(graph,XS_brut,counts,shots,ansatz_H,'bal
print("Connected score: " + str(final_score(graph,XS_brut,counts,shots,ansatz_H,'co
```

```
Base score: 1e-05
Balanced score: 0.00155
Connected score: 0.00026
```

In [87]:
```
# calculate our version of the score for the final solution
print("Base score: " + str(final_score(graph,XS_brut,counts,shots,ansatz_T,'base'))
print("Balanced score: " + str(final_score(graph,XS_brut,counts,shots,ansatz_T,'bal
print("Connected score: " + str(final_score(graph,XS_brut,counts,shots,ansatz_T,'co
```

```
Base score: 1e-05
Balanced score: 0.00145
Connected score: 0.00024
```

This is the main challenge: design optimal ansatz generators and Hamiltonians for the max-cut problem, subject to three specific conditions. Solutions for each condition can be submitted independently; however, a unified approach applicable to all three conditions will receive additional credit.

Submit your results

I guess this is the most important part. You probably want to report your results.

Please, follow the link: https://forms.gle/gkpSCe7HGr7QHZXQ6

Let's revisit the problem statement. **This is important!!!** We have three scoring methods to report:

1. Counts shots achieving the optimal max-cut value. Sorry, no approximation value this time.
2. Adds a balance constraint—subgraphs must have equal cardinality.
3. Requires connected subgraphs—all vertices within a subgraph must be mutually reachable.

For **in-person participants**: Prepare a presentation that explains your research and demonstrates the value of your proposed solution. You can modify any parts of the code, if you can defend your modifications during the presentation.

For **remote participants** (per Daiwei's comment in Discord channel): @everyone, just summarize a few clarifications we just made.

1. you are only suppose to change ansatz builder and hamiltonian builder function, without making any changes to the function signature. So we can do auto-grading.
2. You should submit three notebook. One for each challenge. This way you don't need a argument to specify the challenge type in the ansatz and hamiltonian builder.

3. We will push an update to the git page with all the anoucements and clarifications we did(will do) at 3pm today. ✅

Can you solve this? Good luck!

Feedback

If you have any suggestions or recommendations abou the hackathon challange, please, don't hesitatate to leave your comment here: https://iter.ly/u42um

In [ ]: