

## Question: Cost of Gas

The cost of gas is insane! Can you believe node traversal is so expensive? I wish I had some sort of map or matrix describing the cheapest cost to any node from any node ...

```
NodeA -> NodeC 32324
NodeB -> NodeA 26786
NodeC -> NodeB 77458 NodeC -> NodeD 19905 NodeC -> NodeG 19455
NodeD -> NodeA 64678 NodeD -> NodeE 57878
NodeE -> NodeF 29999 NodeE -> NodeA 82356
NodeF -> NodeC 77777 NodeF -> NodeA 33333 NodeF -> NodeD 88888 NodeF -> NodeG
88888
NodeG -> NodeA 1
```

Example submission: A -> B 1 B -> A 1  
Resulting matrix: A B A 0 1 B 1 0

THIS IS WHAT YOUR FLAG SHOULD LOOK LIKE: STOUTCTF{0110}  
.No spaces  
.One line  
.No letters

This is from the description

solve.py

```
import numpy as np

# Define nodes and edges
nodes = ['A', 'B', 'C', 'D', 'E', 'F', 'G']
edges = [
    ("A", "C", 32324),
    ("B", "A", 26786),
    ("C", "B", 77458), ("C", "D", 19905), ("C", "G", 19455),
    ("D", "A", 64678), ("D", "E", 57878),
    ("E", "F", 29999), ("E", "A", 82356),
    ("F", "C", 77777), ("F", "A", 33333), ("F", "D", 88888), ("F", "G", 88888),
    ("G", "A", 1)
]

# Create adjacency matrix
node_count = len(nodes)
INF = float('inf')
adj_matrix = np.full((node_count, node_count), INF)

# Set diagonal to 0 (self-costs)
np.fill_diagonal(adj_matrix, 0)

# Map node names to indices
```

```

node_index = {node: i for i, node in enumerate(nodes)}

# Fill adjacency matrix with given edges
for src, dst, cost in edges:
    src_idx = node_index[src]
    dst_idx = node_index[dst]
    adj_matrix[src_idx][dst_idx] = cost

# Floyd-Warshall Algorithm for all-pairs shortest paths
for k in range(node_count):
    for i in range(node_count):
        for j in range(node_count):
            adj_matrix[i][j] = min(adj_matrix[i][j], adj_matrix[i][k] + adj_matrix[k][j])

# Replace INF with 0 (for unconnected paths)
shortest_paths_matrix = np.where(adj_matrix == INF, 0, adj_matrix).astype(int)

# Flatten the matrix and format as required
shortest_path_one_line = ".join(map(lambda x: str(int(x)),
shortest_paths_matrix.flatten()))

# Create the final flag
final_flag = f"STOUTCTF{{{shortest_path_one_line}}}"

# Output the flag
print(final_flag)

```

I create the script run it and got the flag !

```

STOUTCTF{010978232324522291101071401065177926786059110790151368931668
927856519456774580199057778310778219455646781744609700205787887877116
457633321731149565611556102999911511133333143115656578556214344008511
2110978332325522301101081401070}

```

## Question: Hackers Keyboard

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	host	1.1.0	USB	36	GET_DESCRIPTOR Request DEVICE
2	0.000000	1.1.0	host	USB	46	GET_DESCRIPTOR Response DEVICE
3	0.000000	host	1.1.0	USB	36	GET_DESCRIPTOR Request CONFIGURATION
4	0.000000	1.1.0	host	USB	87	GET_DESCRIPTOR Response CONFIGURATION
5	0.000000	host	1.1.0	USB	36	SET_CONFIGURATION Request
6	0.000000	1.1.0	host	USB	28	SET_CONFIGURATION Response
7	0.000000	host	1.2.0	USB	36	GET_DESCRIPTOR Request DEVICE
8	0.000000	1.2.0	host	USB	46	GET_DESCRIPTOR Response DEVICE
9	0.000000	host	1.2.0	USB	36	GET_DESCRIPTOR Request CONFIGURATION
10	0.000000	1.2.0	host	USB	282	GET_DESCRIPTOR Response CONFIGURATION
11	0.000000	host	1.2.0	USB	36	SET_CONFIGURATION Request
12	0.000000	1.2.0	host	USB	28	SET_CONFIGURATION Response
13	0.000000	host	1.3.0	USB	36	GET_DESCRIPTOR Request DEVICE
14	0.000000	1.3.0	host	USB	46	GET_DESCRIPTOR Response DEVICE

We were given this file and since it says that his keyboard was hacked in the description so I guess it had something to do with an usb device for keyboards ?? so I filtered it

usb.src == "1.1.1"

No.	Time	Source
19	18.672762	1.1.1
21	18.776762	1.1.1
23	19.024761	1.1.1

▶ Frame 39: 35 bytes on wire (280  
▶ USB URB  
HID Data: 00002c0000000000

After we filter it we can see all the HID Data contains the keyboard's buttons.

AutoSave OFF

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No.	Time	Source	Destination	Protocol	Length	HID Data	Info
19	18.67276	1.1.1	host	USB	35	00000b000000	URB_INTERRUPT in
21	18.77676	1.1.1	host	USB	35	0	URB_INTERRUPT in
23	19.02476	1.1.1	host	USB	35	800000000000	URB_INTERRUPT in
25	19.12676	1.1.1	host	USB	35	0	URB_INTERRUPT in
27	19.38475	1.1.1	host	USB	35	00000f000000	URB_INTERRUPT in
29	19.47276	1.1.1	host	USB	35	0	URB_INTERRUPT in
31	19.52677	1.1.1	host	USB	35	00000f000000	URB_INTERRUPT in
33	19.61676	1.1.1	host	USB	35	0	URB_INTERRUPT in
35	19.71275	1.1.1	host	USB	35	1.2E+11	URB_INTERRUPT in
37	19.80891	1.1.1	host	USB	35	0	URB_INTERRUPT in
39	20.00075	1.1.1	host	USB	35	00002c000000	URB_INTERRUPT in
41	20.89675	1.1.1	host	USB	35	0	URB_INTERRUPT in
43	21.64876	1.1.1	host	USB	35	00000b000000	URB_INTERRUPT in
45	21.72875	1.1.1	host	USB	35	0	URB_INTERRUPT in
47	21.99275	1.1.1	host	USB	35	1.2E+11	URB_INTERRUPT in
49	22.08076	1.1.1	host	USB	35	0	URB_INTERRUPT in
51	22.16075	1.1.1	host	USB	35	1.3E+11	URB_INTERRUPT in
53	22.24075	1.1.1	host	USB	35	0	URB_INTERRUPT in
55	22.34475	1.1.1	host	USB	35	800000000000	URB_INTERRUPT in
57	22.43274	1.1.1	host	USB	35	0	URB_INTERRUPT in
59	22.47275	1.1.1	host	USB	35	00002c000000	URB_INTERRUPT in
61	22.55275	1.1.1	host	USB	35	0	URB_INTERRUPT in
63	22.72675	1.1.1	host	USB	35	00001c000000	URB_INTERRUPT in
65	22.81675	1.1.1	host	USB	35	0	URB_INTERRUPT in
67	23.04875	1.1.1	host	USB	35	1.2E+11	URB_INTERRUPT in
69	23.15274	1.1.1	host	USB	35	0	URB_INTERRUPT in
71	23.28074	1.1.1	host	USB	35	1.8E+11	URB_INTERRUPT in
73	23.38476	1.1.1	host	USB	35	0	URB_INTERRUPT in
75	23.60475	1.1.1	host	USB	35	00002c000000	URB_INTERRUPT in
77	23.58475	1.1.1	host	USB	35	0	URB_INTERRUPT in
79	23.75275	1.1.1	host	USB	35	600000000000	URB_INTERRUPT in

apply as column and export the data as csv

Solve.py

```
#!/usr/bin/python
# coding: utf-8
from __future__ import print_function
import sys, os
```

```
# declare -A lcasekey
lcasekey = {}
# declare -A ucasekey
ucasekey = {}

# associate USB HID scan codes with keys
# ex: key 4 can be both "a" and "A", depending on if SHIFT is held down
lcasekey[4] = "a"; ucasekey[4] = "A"
lcasekey[5] = "b"; ucasekey[5] = "B"
lcasekey[6] = "c"; ucasekey[6] = "C"
lcasekey[7] = "d"; ucasekey[7] = "D"
lcasekey[8] = "e"; ucasekey[8] = "E"
lcasekey[9] = "f"; ucasekey[9] = "F"
lcasekey[10] = "g"; ucasekey[10] = "G"
lcasekey[11] = "h"; ucasekey[11] = "H"
lcasekey[12] = "i"; ucasekey[12] = "I"
lcasekey[13] = "j"; ucasekey[13] = "J"
lcasekey[14] = "k"; ucasekey[14] = "K"
lcasekey[15] = "l"; ucasekey[15] = "L"
lcasekey[16] = "m"; ucasekey[16] = "M"
lcasekey[17] = "n"; ucasekey[17] = "N"
lcasekey[18] = "o"; ucasekey[18] = "O"
lcasekey[19] = "p"; ucasekey[19] = "P"
lcasekey[20] = "q"; ucasekey[20] = "Q"
lcasekey[21] = "r"; ucasekey[21] = "R"
lcasekey[22] = "s"; ucasekey[22] = "S"
lcasekey[23] = "t"; ucasekey[23] = "T"
lcasekey[24] = "u"; ucasekey[24] = "U"
lcasekey[25] = "v"; ucasekey[25] = "V"
lcasekey[26] = "w"; ucasekey[26] = "W"
lcasekey[27] = "x"; ucasekey[27] = "X"
lcasekey[28] = "y"; ucasekey[28] = "Y"
lcasekey[29] = "z"; ucasekey[29] = "Z"
lcasekey[30] = "1"; ucasekey[30] = "!"
lcasekey[31] = "2"; ucasekey[31] = "@"
lcasekey[32] = "3"; ucasekey[32] = "#"
lcasekey[33] = "4"; ucasekey[33] = "$"
lcasekey[34] = "5"; ucasekey[34] = "%"
lcasekey[35] = "6"; ucasekey[35] = "^"
lcasekey[36] = "7"; ucasekey[36] = "&"
lcasekey[37] = "8"; ucasekey[37] = "*"
lcasekey[38] = "9"; ucasekey[38] = "("
lcasekey[39] = "0"; ucasekey[39] = ")"
lcasekey[40] = "Enter"; ucasekey[40] = "Enter"
lcasekey[41] = "esc"; ucasekey[41] = "esc"
lcasekey[42] = "del"; ucasekey[42] = "del"
```

```

lcasekey[43] = "tab"; ucasekey[43] = "tab"
lcasekey[44] = "space"; ucasekey[44] = "space"
lcasekey[45] = "-"; ucasekey[45] = "_"
lcasekey[46] = "="; ucasekey[46] = "+"
lcasekey[47] = "["; ucasekey[47] = "{"
lcasekey[48] = "]"; ucasekey[48] = "}"
lcasekey[49] = "\\"; ucasekey[49] = "|"
lcasekey[50] = " "; ucasekey[50] = " "
lcasekey[51] = ";"; ucasekey[51] = ":"
lcasekey[52] = """; ucasekey[52] = "\"
lcasekey[53] = "`"; ucasekey[53] = "~"
lcasekey[54] = "<"; ucasekey[54] = "<"
lcasekey[55] = ">"; ucasekey[55] = ">"
lcasekey[56] = "/"; ucasekey[56] = "?"
lcasekey[57] = "CapsLock"; ucasekey[57] = "CapsLock"
lcasekey[79] = "RightArrow"; ucasekey[79] = "RightArrow"
lcasekey[80] = "LeftArrow"; ucasekey[80] = "LeftArrow"
lcasekey[84] = "/"; ucasekey[84] = "/"
lcasekey[85] = "*"; ucasekey[85] = "*"
lcasekey[86] = "-"; ucasekey[86] = "-"
lcasekey[87] = "+"; ucasekey[87] = "+"
lcasekey[88] = "Enter"; ucasekey[88] = "Enter"
lcasekey[89] = "1"; ucasekey[89] = "1"
lcasekey[90] = "2"; ucasekey[90] = "2"
lcasekey[91] = "3"; ucasekey[91] = "3"
lcasekey[92] = "4"; ucasekey[92] = "4"
lcasekey[93] = "5"; ucasekey[93] = "5"
lcasekey[94] = "6"; ucasekey[94] = "6"
lcasekey[95] = "7"; ucasekey[95] = "7"
lcasekey[96] = "8"; ucasekey[96] = "8"
lcasekey[97] = "9"; ucasekey[97] = "9"
lcasekey[98] = "0"; ucasekey[98] = "0"
lcasekey[99] = "."; ucasekey[99] = "."

```

```

# modify this line to open the file directly, without command-line arguments
filename = "hid_data.txt"

```

```

# open the file and process the key codes
with open(filename, 'r') as keycodes:
    for line in keycodes:
        # Strip out any whitespace characters and check if the line contains valid hex
        line = line.strip()
        if not all(c in '0123456789ABCDEFabcdef' for c in line):
            print(f"Skipping invalid line: {line}")
            continue

```

```

try:

```

```

# dump line to bytearray
byteArray = bytearray.fromhex(line)
# see if we have a key code
val = int(byteArray[2])
if val > 3 and val < 100:
    # see if left shift or right shift was held down
    if byteArray[0] == 0x02 or byteArray[0] == 0x20:
        print(ucasekey[int(byteArray[2])], end='') # single line output
    else:
        print(lcasekey[int(byteArray[2])], end='') # single line output
except ValueError:
    print(f"Error processing line: {line}")

```

The screenshot shows a VS Code editor with a file named `solve.py` open. The script contains Python code for processing hex lines. The terminal at the bottom shows the execution of `python solve.py`, which outputs the flag `stoutctf{by3yfbt3vs1ecx6ery}` after skipping an invalid line.

```

solve.py x
solve.py > ...
95     print(f"Skipping invalid line: {line}")
96     continue
97
98     try:
99         # dump line to bytearray
100        byteArray = bytearray.fromhex(line)
101        # see if we have a key code
102        val = int(byteArray[2])
103        if val > 3 and val < 100:
104            # see if left shift or right shift was held down
105            if byteArray[0] == 0x02 or byteArray[0] == 0x20:
106                print(ucasekey[int(byteArray[2])], end='') # single line output
107            else:
108                print(lcasekey[int(byteArray[2])], end='') # single line output
109        except ValueError:
110            print(f"Error processing line: {line}")
111
PROBLEMS  OUTPUT  TERMINAL  PORTS  DEBUG CONSOLE
PS C:\Users\akmal\OneDrive\Desktop\ctf> python solve.py
Skipping invalid line: HID Data
hellospacehopespaceyouspacecanspacegetspacehisspaceflag:)spacestoutctf{by3yfbt3vs1ecx6ery}goodspaceluck
PS C:\Users\akmal\OneDrive\Desktop\ctf>

```

I used this script and here I got the flag

`stoutctf{by3yfbt3vs1ecx6ery}`

## Question: Who Said 30 Times

```
File Edit View
00000000 56 6d 30 77 64 32 51 79 55 58 6c 56 57 47 78 57 |Vm0wd2QyUXlVWGxW|
00000010 56 30 64 34 56 31 59 77 5a 44 52 57 4d 56 6c 33 |V0d4V1YwZDRWMVl3|
00000020 57 6b 52 53 56 30 31 57 62 44 4e 58 61 31 4a 54 |WkRSV01WbDNXa1JT|
00000030 56 6a 41 78 56 32 4a 45 54 6c 68 68 4d 55 70 55 |VjAxV2JETlhhMUpU|
00000040 56 6d 70 42 65 46 59 79 53 6b 56 55 62 47 68 6f |VmpBeFYySkvUbGho|
00000050 54 56 56 77 56 56 5a 74 63 45 4a 6c 52 6c 6c 35 |TVVwVVZtcEJlRl15|
00000060 55 32 74 57 56 57 4a 48 61 47 39 55 56 6c 5a 33 |U2tWVWJHaG9UVlZ3|
00000070 56 6c 5a 61 64 47 4e 46 53 6d 78 53 62 47 77 31 |VlZadGNFSmxSbGw1|
00000080 56 54 4a 30 56 31 5a 58 53 6b 68 68 52 7a 6c 56 |VTJ0V1ZXSkhhRzlv|
00000090 56 6d 78 61 4d 31 5a 73 57 6d 46 6b 52 30 35 47 |Vmxam1ZsWmFkR05G|
000000a0 55 32 31 34 55 32 4a 48 64 7a 46 57 56 45 6f 77 |U214U2JHdzFWVEow|
000000b0 56 6a 46 61 57 46 4e 72 61 47 68 53 65 6d 78 57 |VjFaWfNraGhSemxw|
000000c0 56 6d 31 34 59 55 30 78 57 6e 4e 58 62 55 5a 72 |Vm14YU0xWnNXbUZr|
000000d0 55 6a 41 31 52 31 55 79 4d 54 52 56 4d 6b 70 49 |UjA1R1UyMTRVMkpI|
000000e0 5a 48 70 47 56 31 5a 46 62 33 64 57 61 6b 5a 68 |ZHPGV1ZFb3dWakZh|
000000f0 56 30 5a 4f 63 6d 46 48 61 46 4e 6c 62 58 68 58 |V0Z0cmFHaFNlbXhX|
00000100 56 6d 30 78 4e 46 6c 56 4d 48 68 58 62 6b 35 59 |Vm0xNf1VMHhXbk5Y|
00000110 59 6c 56 61 63 6c 56 71 51 54 46 53 4d 56 56 35 |YlVaclVqQTFSMvV5|
00000120 54 56 52 53 56 6b 31 72 63 45 6c 61 53 48 42 48 |TVRSVk1rcElasHBH|
00000130 56 6a 46 61 52 6d 49 7a 5a 46 64 68 61 31 70 6f |VjFaRmIzZFdhapo|
00000140 56 6a 42 61 54 32 4e 74 52 6b 68 68 52 6b 35 73 |VjBaT2NtRkhhRk5s|
00000150 59 6c 68 6f 57 46 5a 74 4d 48 68 4f 52 6d 78 57 |YlhowFZtMHhORMxw|
00000160 54 55 68 6f 57 47 4a 72 4e 56 6c 5a 62 46 5a 68 |TUhowGJrNVlZbFZh|
00000170 59 32 78 57 63 56 46 55 52 6c 4e 4e 56 6c 59 31 |Y2xWcVFURlNNVlY1|
00000180 56 46 5a 53 55 31 5a 72 4d 58 4a 6a 52 57 78 68 |VFZSU1ZrMXJjRWxh|
00000190 55 30 68 43 53 46 5a 71 52 6d 46 53 62 55 6c 36 |U0hCSFZqRmFSbU16|
000001a0 57 6b 5a 6b 61 47 45 78 63 47 39 57 61 6b 4a 68 |WkZkaGExcG9WakJh|
000001b0 56 44 4a 4f 64 46 4a 72 61 47 68 53 61 7a 56 7a |VDJ0dFJraGhSazVz|
000001c0 57 57 78 6f 62 31 64 47 57 6e 52 4e 53 47 68 50 |Wwxob1dGwnRNSGHP|
000001d0 55 6d 31 34 56 31 52 56 61 47 39 58 52 30 70 79 |Um14V1RVaG9XR0py|
000001e0 54 6c 5a 73 57 6d 4a 47 57 6d 68 5a 4d 6e 68 58 |TlZsWmJGWmhZMnhX|
000001f0 59 31 5a 47 56 56 4a 73 54 6b 35 57 62 46 6b 78 |Y1ZGVVJsTk5WbFkx|
00000200 56 6b 5a 61 55 31 55 78 57 6e 4a 4e 57 45 70 71 |VkZaU1UxwnJNWEpq|
00000210 55 6c 64 34 61 46 55 77 61 45 4e 54 52 6c 70 78 |Uld4aFUwaENTRlpx|
00000220 55 6d 31 47 55 32 4a 56 62 44 5a 58 61 31 70 72 |Um1GU2JVbDZXa1pr|
00000230 59 55 64 46 65 47 4e 48 4f 56 64 68 61 30 70 6f |YUdFeGNHOvdha0po|
00000240 56 6b 52 4b 54 32 52 47 53 6e 4a 68 52 32 68 54 |VkrKT2RGsnJhR2hT|
00000250 59 58 70 57 65 6c 64 58 65 47 39 69 4d 57 52 48 |YXpWeldXeG9iMWRH|
00000260 56 32 35 53 54 6c 4e 48 61 46 42 56 62 54 45 30 |V25STlNHafBVbTE0|
Ln 1, Col 1 1,235,511 characters 100% Unix (LF) UTF-8
```

The file given so I open it with notepad and extract the hex.

```
solve.py x Who_Said_30.txt
solve.py > ...
3 def extract_strings_from_file(filename):
4     content = file.read()
5
6     # Define the regular expression pattern to match text between '|'
7     pattern = r'|([^\|]+)|'
8
9     # Find all matches of the pattern
10    matched_strings = re.findall(pattern, content)
11
12    if matched_strings:
13        # Print all the extracted strings on a single line
14        print("".join(matched_strings))
15    else:
16        print("No strings found within | |")
17
18    except Exception as e:
19        print(f"An error occurred: {e}")
20
21    # Usage: specify the filename where you want to filter the strings
22    filename = 'Who_Said_30.txt' # Replace this with your actual file path
23    extract_strings_from_file(filename)
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```



Now decode the base64 30 times

```
import base64

# Decode base64 content multiple times
def decode_base64_multiple_times(encoded_str, times=30):
    decoded = encoded_str
    for _ in range(times):
        decoded = base64.b64decode(decoded).decode('utf-8', errors='ignore')
    return decoded

# Usage example: Assuming the content is read from a file
def decode_file_content(file_path, times=30):
    # Read the file content
    with open(file_path, 'r') as file:
        encoded_content = file.read()

    # Decode the content multiple times
    decoded_content = decode_base64_multiple_times(encoded_content, times)

    # Save the decoded content to a new file
    decoded_file_path = "decoded_content.txt"
    with open(decoded_file_path, 'w') as file:
        file.write(decoded_content)

    return decoded_file_path
```

Flag : STOUTCTF{djfRQP4yBWjbcnEEixBHvUvta8iZd5Fm}