```
import pandas as pd
import numpy as np


from google.colab import drive
drive.mount('/content/drive/')
```

```
Drive already mounted at /content/drive/; to attempt to forcibly remount, call drive.mount("/content/drive/", force_remount=True).
```

```
raw_data = pd.read_csv('/content/drive/MyDrive/Colab Notebooks/WA_Fn-UseC_-Telco-Customer-Churn.csv')
data = raw_data.copy()
data
```

| | customerID | gender | SeniorCitizen | Partner | Dependents | tenure | PhoneService | MultipleLines | InternetService | OnlineSecurity | ... | DeviceProtection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 7590-VHVEG | Female | 0 | Yes | No | 1 | No | No phone service | DSL | No | ... | No |
| **1** | 5575-GNVDE | Male | 0 | No | No | 34 | Yes | No | DSL | Yes | ... | Yes |
| **2** | 3668-QPYBK | Male | 0 | No | No | 2 | Yes | No | DSL | Yes | ... | No |
| **3** | 7795-CFOCW | Male | 0 | No | No | 45 | No | No phone service | DSL | Yes | ... | Yes |
| **4** | 9237-HQITU | Female | 0 | No | No | 2 | Yes | No | Fiber optic | No | ... | No |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **7038** | 6840-RESVB | Male | 0 | Yes | Yes | 24 | Yes | Yes | DSL | Yes | ... | Yes |
| **7039** | 2234-XADUH | Female | 0 | Yes | Yes | 72 | Yes | Yes | Fiber optic | No | ... | Yes |
| **7040** | 4801-JZAZL | Female | 0 | Yes | Yes | 11 | No | No phone service | DSL | Yes | ... | No |
| **7041** | 8361-LTMKD | Male | 1 | Yes | No | 4 | Yes | Yes | Fiber optic | No | ... | No |
| **7042** | 3186-AJIEK | Male | 0 | No | No | 66 | Yes | No | Fiber optic | Yes | ... | Yes |

7043 rows × 21 columns

```
data.describe(include='all')
```

| | customerID | gender | SeniorCitizen | Partner | Dependents | tenure | PhoneService | MultipleLines | InternetService | OnlineSecurity | ... | DeviceProte |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **count** | 7043 | 7043 | 7043.000000 | 7043 | 7043 | 7043.000000 | 7043 | 7043 | 7043 | 7043 | ... | |
| **unique** | 7043 | 2 | NaN | 2 | 2 | NaN | 2 | 3 | 3 | 3 | ... | |
| **top** | 7590-VHVEG | Male | NaN | No | No | NaN | Yes | No | Fiber optic | No | ... | |
| **freq** | 1 | 3555 | NaN | 3641 | 4933 | NaN | 6361 | 3390 | 3096 | 3498 | ... | |
| **mean** | NaN | NaN | 0.162147 | NaN | NaN | 32.371149 | NaN | NaN | NaN | NaN | ... | |
| **std** | NaN | NaN | 0.368612 | NaN | NaN | 24.559481 | NaN | NaN | NaN | NaN | ... | |
| **min** | NaN | NaN | 0.000000 | NaN | NaN | 0.000000 | NaN | NaN | NaN | NaN | ... | |
| **25%** | NaN | NaN | 0.000000 | NaN | NaN | 9.000000 | NaN | NaN | NaN | NaN | ... | |
| **50%** | NaN | NaN | 0.000000 | NaN | NaN | 29.000000 | NaN | NaN | NaN | NaN | ... | |
| **75%** | NaN | NaN | 0.000000 | NaN | NaN | 55.000000 | NaN | NaN | NaN | NaN | ... | |
| **max** | NaN | NaN | 1.000000 | NaN | NaN | 72.000000 | NaN | NaN | NaN | NaN | ... | |

11 rows × 21 columns

```
data = data.drop('customerID', axis = 1)
data
```

| | gender | SeniorCitizen | Partner | Dependents | tenure | PhoneService | MultipleLines | InternetService | OnlineSecurity | OnlineBackup | DeviceProtection | Te |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | Female | 0 | Yes | No | 1 | No | No phone service | DSL | No | Yes | No | |
| **1** | Male | 0 | No | No | 34 | Yes | No | DSL | Yes | No | Yes | |
| **2** | Male | 0 | No | No | 2 | Yes | No | DSL | Yes | Yes | No | |
| **3** | Male | 0 | No | No | 45 | No | No phone service | DSL | Yes | No | Yes | |
| **4** | Female | 0 | No | No | 2 | Yes | No | Fiber optic | No | No | No | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **7038** | Male | 0 | Yes | Yes | 24 | Yes | Yes | DSL | Yes | No | Yes | |
| **7039** | Female | 0 | Yes | Yes | 72 | Yes | Yes | Fiber optic | No | Yes | Yes | |
| **7040** | Female | 0 | Yes | Yes | 11 | No | No phone service | DSL | Yes | No | No | |
| **7041** | Male | 1 | Yes | No | 4 | Yes | Yes | Fiber optic | No | No | No | |
| **7042** | Male | 0 | No | No | 66 | Yes | No | Fiber optic | Yes | No | Yes | |

7043 rows × 20 columns

```
data.isnull().sum()
```

```
gender              0
SeniorCitizen       0
Partner             0
Dependents          0
tenure              0
PhoneService        0
MultipleLines       0
InternetService     0
OnlineSecurity      0
OnlineBackup        0
DeviceProtection    0
TechSupport         0
StreamingTV         0
StreamingMovies     0
Contract            0
PaperlessBilling    0
PaymentMethod       0
MonthlyCharges      0
TotalCharges        0
Churn               0
dtype: int64
```

```
data['gender'] = data['gender'].map({'Male':0, 'Female':1})
data['gender']
```

```
0       1
1       0
2       0
3       0
4       1
       ..
7038    0
7039    1
7040    1
7041    0
7042    0
Name: gender, Length: 7043, dtype: int64
```

```
data
```

| | gender | SeniorCitizen | Partner | Dependents | tenure | PhoneService | MultipleLines | InternetService | OnlineSecurity | OnlineBackup | DeviceProtection | Te |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 0 | Yes | No | 1 | No | No phone service | DSL | No | Yes | No | |
| **1** | 0 | 0 | No | No | 34 | Yes | No | DSL | Yes | No | Yes | |
| **2** | 0 | 0 | No | No | 2 | Yes | No | DSL | Yes | Yes | No | |
| **3** | 0 | 0 | No | No | 45 | No | No phone service | DSL | Yes | No | Yes | |
| **4** | 1 | 0 | No | No | 2 | Yes | No | Fiber optic | No | No | No | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **7038** | 0 | 0 | Yes | Yes | 24 | Yes | Yes | DSL | Yes | No | Yes | |
| **7039** | 1 | 0 | Yes | Yes | 72 | Yes | Yes | Fiber optic | No | Yes | Yes | |
| **7040** | 1 | 0 | Yes | Yes | 11 | No | No phone service | DSL | Yes | No | No | |
| **7041** | 0 | 1 | Yes | No | 4 | Yes | Yes | Fiber optic | No | No | No | |
| **7042** | 0 | 0 | No | No | 66 | Yes | No | Fiber optic | Yes | No | Yes | |

7043 rows × 20 columns

```
data['Partner'].unique()
```

```
array(['Yes', 'No'], dtype=object)
```

```
data['Partner'] = data['Partner'].map({data['Partner'].unique()[0]:1, data['Partner'].unique()[1]:0})
data['Partner']
```

```
0       1
1       0
2       0
3       0
4       0
       ..
7038    1
7039    1
7040    1
7041    1
7042    0
Name: Partner, Length: 7043, dtype: int64
```

```
data['Dependents'].unique()
```

```
array(['No', 'Yes'], dtype=object)
```

```
data['Dependents'] = data['Dependents'].map({data['Dependents'].unique()[0]:1, data['Dependents'].unique()[1]:0})
data['Dependents']
```

```
0       1
1       1
2       1
3       1
4       1
       ..
7038    0
7039    0
7040    0
7041    1
7042    1
Name: Dependents, Length: 7043, dtype: int64
```

```
data['PhoneService'].unique()
```

```
array(['No', 'Yes'], dtype=object)
```

```
data['PhoneService'] = data['PhoneService'].map({data['PhoneService'].unique()[0]:1, data['PhoneService'].unique()[1]:0})
data['PhoneService']
```

```
0       1
1       0
2       0
3       1
4       0
```

```
       ..
7038    0
7039    0
7040    1
7041    0
7042    0
Name: PhoneService, Length: 7043, dtype: int64
```

```
data
```

| | gender | SeniorCitizen | Partner | Dependents | tenure | PhoneService | MultipleLines | InternetService | OnlineSecurity | OnlineBackup | DeviceProtection | Te |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 0 | 1 | 1 | 1 | 1 | No phone service | DSL | No | Yes | No | |
| **1** | 0 | 0 | 0 | 1 | 34 | 0 | No | DSL | Yes | No | Yes | |
| **2** | 0 | 0 | 0 | 1 | 2 | 0 | No | DSL | Yes | Yes | No | |
| **3** | 0 | 0 | 0 | 1 | 45 | 1 | No phone service | DSL | Yes | No | Yes | |
| **4** | 1 | 0 | 0 | 1 | 2 | 0 | No | Fiber optic | No | No | No | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **7038** | 0 | 0 | 1 | 0 | 24 | 0 | Yes | DSL | Yes | No | Yes | |
| **7039** | 1 | 0 | 1 | 0 | 72 | 0 | Yes | Fiber optic | No | Yes | Yes | |
| **7040** | 1 | 0 | 1 | 0 | 11 | 1 | No phone service | DSL | Yes | No | No | |
| **7041** | 0 | 1 | 1 | 1 | 4 | 0 | Yes | Fiber optic | No | No | No | |
| **7042** | 0 | 0 | 0 | 1 | 66 | 0 | No | Fiber optic | Yes | No | Yes | |

7043 rows × 20 columns

```
data['MultipleLines'].unique()
```

```
array(['No phone service', 'No', 'Yes'], dtype=object)
```

```
data['MultipleLines'] = data['MultipleLines'].map({data['MultipleLines'].unique()[0]:0, data['MultipleLines'].unique()[1]:1, data['MultipleLines'].unique()[2
data['MultipleLines']
```

```
0       0
1       1
2       1
3       0
4       1
       ..
7038    2
7039    2
7040    0
7041    2
7042    1
Name: MultipleLines, Length: 7043, dtype: int64
```

```
data['InternetService'].unique()
```

```
array(['DSL', 'Fiber optic', 'No'], dtype=object)
```

```
data['InternetService'] = data['InternetService'].map({data['InternetService'].unique()[0]:1, data['InternetService'].unique()[1]:2, data['InternetService'].
data['InternetService']
```

```
0       1
1       1
2       1
3       1
4       2
       ..
7038    1
7039    2
7040    1
7041    2
7042    2
Name: InternetService, Length: 7043, dtype: int64
```

```
data['OnlineSecurity'].unique()
```

```
array(['No', 'Yes', 'No internet service'], dtype=object)
```

```
data['OnlineSecurity'] = data['OnlineSecurity'].map({data['OnlineSecurity'].unique()[0]:0, data['OnlineSecurity'].unique()[1]:1, data['OnlineSecurity'].uniqu
data['OnlineSecurity']
```

```
0       0
1       1
2       1
3       1
4       0
       ..
7038    1
7039    0
7040    1
7041    0
7042    1
Name: OnlineSecurity, Length: 7043, dtype: int64
```

```
data['OnlineBackup'].unique()
```

```
array(['Yes', 'No', 'No internet service'], dtype=object)
```

```
data['OnlineBackup'] = data['OnlineBackup'].map({data['OnlineBackup'].unique()[0]:1, data['OnlineBackup'].unique()[1]:0, data['OnlineBackup'].unique()[2]:2})
data['OnlineBackup']
```

```
0       1
1       0
2       1
3       0
4       0
       ..
7038    0
7039    1
7040    0
7041    0
7042    0
Name: OnlineBackup, Length: 7043, dtype: int64
```

```
data['DeviceProtection'].unique()
```

```
array(['No', 'Yes', 'No internet service'], dtype=object)
```

```
data['DeviceProtection'] = data['DeviceProtection'].map({data['DeviceProtection'].unique()[0]:0, data['DeviceProtection'].unique()[1]:1, data['DeviceProtectior
data['DeviceProtection']
```

```
0       0
1       1
2       0
3       1
4       0
       ..
7038    1
7039    1
7040    0
7041    0
7042    1
Name: DeviceProtection, Length: 7043, dtype: int64
```

```
data['TechSupport'].unique()
```

```
array(['No', 'Yes', 'No internet service'], dtype=object)
```

```
data['TechSupport'] = data['TechSupport'].map({data['TechSupport'].unique()[0]:0, data['TechSupport'].unique()[1]:1, data['TechSupport'].unique()[2]:2})
data['TechSupport']
```

```
0       0
1       0
2       0
3       1
4       0
       ..
7038    1
7039    0
7040    0
7041    0
7042    1
Name: TechSupport, Length: 7043, dtype: int64
```

```
data.describe(include='all')
```

| | gender | SeniorCitizen | Partner | Dependents | tenure | PhoneService | MultipleLines | InternetService | OnlineSecurity | OnlineBackup | Devic |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **count** | 7043.000000 | 7043.000000 | 7043.000000 | 7043.000000 | 7043.000000 | 7043.000000 | 7043.000000 | 7043.000000 | 7043.000000 | 7043.000000 | |
| **unique** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | |
| **top** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | |
| **freq** | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | |
| **mean** | 0.495244 | 0.162147 | 0.483033 | 0.700412 | 32.371149 | 0.096834 | 1.325004 | 1.222916 | 0.720006 | 0.778220 | |
| **std** | 0.500013 | 0.368612 | 0.499748 | 0.458110 | 24.559481 | 0.295752 | 0.642730 | 0.778877 | 0.796885 | 0.778472 | |
| **min** | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | |
| **25%** | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 9.000000 | 0.000000 | 1.000000 | 1.000000 | 0.000000 | 0.000000 | |
| **50%** | 0.000000 | 0.000000 | 0.000000 | 1.000000 | 29.000000 | 0.000000 | 1.000000 | 1.000000 | 1.000000 | 1.000000 | |
| **75%** | 1.000000 | 0.000000 | 1.000000 | 1.000000 | 55.000000 | 0.000000 | 2.000000 | 2.000000 | 1.000000 | 1.000000 | |
| **max** | 1.000000 | 1.000000 | 1.000000 | 1.000000 | 72.000000 | 1.000000 | 2.000000 | 2.000000 | 2.000000 | 2.000000 | |

```
data['StreamingTV'].unique()
```

```
array(['No', 'Yes', 'No internet service'], dtype=object)
```

```
data['StreamingTV'] = data['StreamingTV'].map({data['StreamingTV'].unique()[0]:0, data['StreamingTV'].unique()[1]:1, data['StreamingTV'].unique()[2]:2})
data['StreamingTV']
```

```
0       0
1       0
2       0
3       0
4       0
       ..
7038    1
7039    1
7040    0
7041    0
7042    1
Name: StreamingTV, Length: 7043, dtype: int64
```

```
data['StreamingMovies'].unique()
```

```
array(['No', 'Yes', 'No internet service'], dtype=object)
```

```
data['StreamingMovies'] = data['StreamingMovies'].map({data['StreamingMovies'].unique()[0]:0, data['StreamingMovies'].unique()[1]:1, data['StreamingMovies'].
data['StreamingMovies']
```

```
0       0
1       0
2       0
3       0
4       0
       ..
7038    1
7039    1
7040    0
7041    0
7042    1
Name: StreamingMovies, Length: 7043, dtype: int64
```

```
data['Contract'].unique()
```

```
array(['Month-to-month', 'One year', 'Two year'], dtype=object)
```

```
data['Contract'] = data['Contract'].map({data['Contract'].unique()[0]:0, data['Contract'].unique()[1]:1, data['Contract'].unique()[2]:2})
data['Contract']
```

```
0       0
1       1
2       0
3       1
4       0
       ..
7038    1
7039    1
7040    0
7041    0
7042    2
Name: Contract, Length: 7043, dtype: int64
```

```
data['PaperlessBilling'].unique()
```

```
array(['Yes', 'No'], dtype=object)
```

```
data['PaperlessBilling'] = data['PaperlessBilling'].map({data['PaperlessBilling'].unique()[0]:1, data['PaperlessBilling'].unique()[1]:0})
data['PaperlessBilling']
```

```
0       1
1       0
2       1
3       0
4       1
       ..
7038    1
7039    1
7040    1
7041    1
7042    1
Name: PaperlessBilling, Length: 7043, dtype: int64
```

```
data['PaymentMethod'].unique()
```

```
array(['Electronic check', 'Mailed check', 'Bank transfer (automatic)',
       'Credit card (automatic)'], dtype=object)
```

```
data['PaymentMethod'] = data['PaymentMethod'].map({data['PaymentMethod'].unique()[0]:0, data['PaymentMethod'].unique()[1]:1, data['PaymentMethod'].unique()[2
data['PaymentMethod']
```

```
0       0
1       1
2       1
3       2
4       0
       ..
7038    1
7039    3
7040    0
7041    1
7042    2
Name: PaymentMethod, Length: 7043, dtype: int64
```

```
pd.options.display.max_columns = None
pd.options.display.max_rows = None
```

```
display(data)
```

| | gender | SeniorCitizen | Partner | Dependents | tenure | PhoneService | MultipleLines | InternetService | OnlineSecurity | OnlineBackup | DeviceProtection | Te |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | |
| **1** | 0 | 0 | 0 | 1 | 34 | 0 | 1 | 1 | 1 | 0 | 1 | |
| **2** | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 0 | |
| **3** | 0 | 0 | 0 | 1 | 45 | 1 | 0 | 1 | 1 | 0 | 1 | |
| **4** | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | |
| **5** | 1 | 0 | 0 | 1 | 8 | 0 | 2 | 2 | 0 | 0 | 1 | |
| **6** | 0 | 0 | 0 | 0 | 22 | 0 | 2 | 2 | 0 | 1 | 0 | |
| **7** | 1 | 0 | 0 | 1 | 10 | 1 | 0 | 1 | 1 | 0 | 0 | |
| **8** | 1 | 0 | 1 | 1 | 28 | 0 | 2 | 2 | 0 | 0 | 1 | |
| **9** | 0 | 0 | 0 | 0 | 62 | 0 | 1 | 1 | 1 | 1 | 0 | |
| **10** | 0 | 0 | 1 | 0 | 13 | 0 | 1 | 1 | 1 | 0 | 0 | |
| **11** | 0 | 0 | 0 | 1 | 16 | 0 | 1 | 0 | 2 | 2 | 2 | |
| **12** | 0 | 0 | 1 | 1 | 58 | 0 | 2 | 2 | 0 | 0 | 1 | |
| **13** | 0 | 0 | 0 | 1 | 49 | 0 | 2 | 2 | 0 | 1 | 1 | |
| **14** | 0 | 0 | 0 | 1 | 25 | 0 | 1 | 2 | 1 | 0 | 1 | |
| **15** | 1 | 0 | 1 | 0 | 69 | 0 | 2 | 2 | 1 | 1 | 1 | |
| **16** | 1 | 0 | 0 | 1 | 52 | 0 | 1 | 0 | 2 | 2 | 2 | |
| **17** | 0 | 0 | 0 | 0 | 71 | 0 | 2 | 2 | 1 | 0 | 1 | |
| **18** | 1 | 0 | 1 | 0 | 10 | 0 | 1 | 1 | 0 | 0 | 1 | |
| **19** | 1 | 0 | 0 | 1 | 21 | 0 | 1 | 2 | 0 | 1 | 1 | |
| **20** | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | |
| **21** | 0 | 0 | 1 | 1 | 12 | 0 | 1 | 0 | 2 | 2 | 2 | |
| **22** | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 2 | |
| **23** | 1 | 0 | 1 | 1 | 58 | 0 | 2 | 1 | 0 | 1 | 0 | |
| **24** | 0 | 0 | 1 | 0 | 49 | 0 | 1 | 1 | 1 | 1 | 0 | |
| **25** | 1 | 0 | 0 | 1 | 30 | 0 | 1 | 1 | 1 | 1 | 0 | |
| **26** | 0 | 0 | 1 | 0 | 47 | 0 | 2 | 2 | 0 | 1 | 0 | |
| **27** | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | |
| **28** | 0 | 0 | 1 | 1 | 72 | 0 | 2 | 1 | 1 | 1 | 1 | |
| **29** | 1 | 0 | 0 | 0 | 17 | 0 | 1 | 1 | 0 | 0 | 0 | |
| **30** | 1 | 1 | 1 | 1 | 71 | 0 | 2 | 2 | 1 | 1 | 1 | |
| **31** | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | 0 | 1 | |
| **32** | 1 | 0 | 1 | 0 | 27 | 0 | 1 | 1 | 1 | 1 | 1 | |
| **33** | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 2 | |
| **34** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | |
| **35** | 1 | 0 | 1 | 0 | 72 | 0 | 2 | 2 | 1 | 1 | 0 | |
| **36** | 0 | 0 | 0 | 1 | 5 | 0 | 1 | 2 | 0 | 0 | 0 | |
| **37** | 1 | 0 | 0 | 1 | 46 | 0 | 1 | 2 | 0 | 0 | 1 | |
| **38** | 0 | 0 | 0 | 1 | 34 | 0 | 2 | 2 | 0 | 1 | 1 | |
| **39** | 1 | 0 | 0 | 1 | 11 | 0 | 2 | 2 | 0 | 0 | 1 | |
| **40** | 0 | 0 | 1 | 0 | 10 | 0 | 1 | 1 | 0 | 1 | 0 | |
| **41** | 1 | 0 | 1 | 0 | 70 | 0 | 2 | 1 | 1 | 1 | 0 | |
| **42** | 1 | 0 | 1 | 0 | 17 | 0 | 1 | 0 | 2 | 2 | 2 | |
| **43** | 1 | 0 | 0 | 1 | 63 | 0 | 2 | 1 | 1 | 1 | 1 | |
| **44** | 1 | 0 | 1 | 1 | 13 | 0 | 2 | 1 | 1 | 1 | 0 | |
| **45** | 1 | 0 | 0 | 1 | 49 | 0 | 2 | 2 | 0 | 0 | 0 | |
| **46** | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 0 | |
| **47** | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | |
| **48** | 0 | 0 | 0 | 1 | 52 | 0 | 2 | 1 | 1 | 0 | 0 | |
| **49** | 1 | 0 | 1 | 0 | 69 | 0 | 2 | 1 | 1 | 0 | 1 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **50** | 1 | 1 | 0 | 1 | 43 | 0 | 2 | 2 | 0 | 1 | 0 |
| **51** | 1 | 0 | 0 | 1 | 15 | 0 | 1 | 2 | 1 | 1 | 0 |
| **52** | 1 | 1 | 1 | 1 | 25 | 0 | 2 | 1 | 1 | 0 | 0 |
| **53** | 1 | 1 | 1 | 1 | 8 | 0 | 2 | 2 | 0 | 1 | 0 |
| **54** | 1 | 1 | 1 | 0 | 60 | 0 | 1 | 1 | 1 | 1 | 1 |
| **55** | 0 | 1 | 0 | 1 | 18 | 0 | 2 | 2 | 0 | 0 | 0 |
| **56** | 1 | 0 | 1 | 0 | 63 | 0 | 2 | 2 | 1 | 0 | 0 |
| **57** | 0 | 1 | 1 | 0 | 66 | 0 | 2 | 2 | 0 | 1 | 1 |
| **58** | 1 | 0 | 1 | 0 | 34 | 0 | 2 | 0 | 2 | 2 | 2 |
| **59** | 1 | 0 | 0 | 1 | 72 | 0 | 2 | 2 | 0 | 0 | 1 |
| **60** | 1 | 0 | 1 | 1 | 47 | 0 | 2 | 2 | 0 | 0 | 1 |
| **61** | 0 | 0 | 0 | 1 | 60 | 0 | 2 | 2 | 0 | 1 | 0 |
| **62** | 0 | 0 | 1 | 1 | 72 | 1 | 0 | 1 | 1 | 1 | 1 |
| **63** | 1 | 0 | 1 | 0 | 18 | 0 | 1 | 1 | 0 | 0 | 1 |
| **64** | 1 | 0 | 0 | 1 | 9 | 0 | 2 | 2 | 0 | 0 | 0 |
| **65** | 1 | 0 | 0 | 1 | 3 | 0 | 1 | 1 | 0 | 1 | 0 |
| **66** | 0 | 0 | 1 | 1 | 47 | 0 | 2 | 2 | 0 | 1 | 0 |
| **67** | 1 | 0 | 0 | 1 | 31 | 0 | 1 | 1 | 0 | 1 | 1 |
| **68** | 1 | 0 | 1 | 0 | 50 | 0 | 1 | 0 | 2 | 2 | 2 |
| **69** | 0 | 0 | 0 | 1 | 10 | 0 | 1 | 2 | 1 | 0 | 1 |
| **70** | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| **71** | 1 | 0 | 1 | 0 | 52 | 0 | 1 | 0 | 2 | 2 | 2 |
| **72** | 0 | 1 | 1 | 0 | 64 | 0 | 2 | 2 | 1 | 0 | 1 |
| **73** | 0 | 0 | 1 | 0 | 62 | 0 | 2 | 0 | 2 | 2 | 2 |
| **74** | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 1 | 1 | 0 | 0 |
| **75** | 1 | 1 | 0 | 1 | 56 | 0 | 2 | 2 | 1 | 1 | 1 |
| **76** | 1 | 0 | 0 | 1 | 46 | 0 | 1 | 1 | 0 | 0 | 0 |
| **77** | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 1 | 1 | 1 | 0 |
| **78** | 0 | 1 | 0 | 1 | 30 | 0 | 1 | 1 | 1 | 1 | 0 |
| **79** | 1 | 0 | 1 | 0 | 45 | 0 | 2 | 0 | 2 | 2 | 2 |
| **80** | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 |
| **81** | 1 | 0 | 1 | 0 | 11 | 1 | 0 | 1 | 1 | 0 | 0 |
| **82** | 1 | 0 | 1 | 1 | 7 | 0 | 1 | 2 | 0 | 0 | 1 |
| **83** | 1 | 0 | 0 | 1 | 42 | 0 | 1 | 2 | 0 | 1 | 1 |
| **84** | 1 | 0 | 1 | 1 | 49 | 0 | 1 | 0 | 2 | 2 | 2 |
| **85** | 0 | 0 | 0 | 1 | 9 | 0 | 2 | 2 | 0 | 1 | 0 |
| **86** | 1 | 0 | 1 | 1 | 35 | 0 | 1 | 1 | 1 | 0 | 0 |
| **87** | 1 | 0 | 1 | 0 | 48 | 0 | 1 | 0 | 2 | 2 | 2 |
| **88** | 1 | 0 | 1 | 0 | 46 | 0 | 1 | 0 | 2 | 2 | 2 |
| **89** | 0 | 0 | 1 | 1 | 29 | 1 | 0 | 1 | 0 | 0 | 0 |
| **90** | 0 | 0 | 1 | 0 | 30 | 0 | 1 | 2 | 0 | 1 | 1 |
| **91** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 0 |
| **92** | 0 | 0 | 1 | 0 | 66 | 0 | 2 | 1 | 1 | 0 | 1 |
| **93** | 1 | 0 | 0 | 1 | 65 | 0 | 2 | 2 | 1 | 1 | 1 |
| **94** | 0 | 0 | 0 | 1 | 72 | 0 | 2 | 2 | 0 | 1 | 1 |
| **95** | 1 | 0 | 0 | 1 | 12 | 0 | 2 | 2 | 1 | 0 | 0 |
| **96** | 0 | 0 | 1 | 0 | 71 | 0 | 2 | 1 | 1 | 1 | 0 |
| **97** | 0 | 0 | 0 | 1 | 5 | 0 | 1 | 0 | 2 | 2 | 2 |
| **98** | 0 | 0 | 0 | 1 | 52 | 0 | 1 | 0 | 2 | 2 | 2 |
| **99** | 1 | 1 | 1 | 1 | 25 | 0 | 1 | 2 | 0 | 1 | 1 |
| **100** | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 2 |
| **101** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 2 | 2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **101** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 2 | 2 |
| **102** | 0 | 0 | 0 | 1 | 38 | 0 | 2 | 2 | 0 | 0 | 1 |
| **103** | 1 | 1 | 1 | 1 | 66 | 1 | 0 | 1 | 0 | 1 | 1 |
| **104** | 0 | 0 | 1 | 1 | 68 | 0 | 2 | 2 | 0 | 1 | 1 |
| **105** | 0 | 0 | 0 | 1 | 5 | 1 | 0 | 1 | 0 | 0 | 0 |
| **106** | 1 | 0 | 1 | 0 | 72 | 0 | 2 | 2 | 1 | 1 | 0 |
| **107** | 1 | 0 | 0 | 1 | 32 | 1 | 0 | 1 | 1 | 0 | 0 |
| **108** | 0 | 0 | 0 | 1 | 43 | 0 | 2 | 2 | 0 | 0 | 0 |
| **109** | 0 | 0 | 1 | 0 | 72 | 0 | 1 | 0 | 2 | 2 | 2 |
| **110** | 0 | 0 | 1 | 1 | 55 | 0 | 2 | 2 | 1 | 1 | 0 |
| **111** | 1 | 0 | 0 | 1 | 52 | 0 | 1 | 1 | 1 | 0 | 1 |
| **112** | 1 | 0 | 0 | 1 | 43 | 0 | 1 | 2 | 0 | 1 | 1 |
| **113** | 1 | 1 | 1 | 1 | 37 | 0 | 2 | 2 | 0 | 0 | 0 |
| **114** | 1 | 0 | 1 | 0 | 64 | 1 | 0 | 1 | 0 | 1 | 0 |
| **115** | 0 | 0 | 1 | 0 | 3 | 0 | 1 | 2 | 1 | 1 | 0 |
| **116** | 1 | 0 | 0 | 1 | 36 | 1 | 0 | 1 | 1 | 0 | 0 |
| **117** | 1 | 0 | 1 | 0 | 10 | 0 | 2 | 2 | 1 | 0 | 0 |
| **118** | 1 | 0 | 0 | 1 | 41 | 0 | 1 | 0 | 2 | 2 | 2 |
| **119** | 0 | 0 | 1 | 0 | 27 | 0 | 2 | 2 | 0 | 1 | 0 |
| **120** | 1 | 0 | 1 | 0 | 56 | 0 | 2 | 2 | 0 | 0 | 1 |
| **121** | 1 | 0 | 0 | 1 | 6 | 0 | 1 | 0 | 2 | 2 | 2 |
| **122** | 0 | 0 | 0 | 1 | 3 | 0 | 2 | 2 | 0 | 0 | 0 |
| **123** | 1 | 0 | 1 | 0 | 7 | 0 | 1 | 1 | 1 | 0 | 0 |
| **124** | 1 | 0 | 1 | 0 | 4 | 0 | 1 | 0 | 2 | 2 | 2 |
| **125** | 0 | 0 | 0 | 1 | 33 | 0 | 1 | 2 | 1 | 0 | 0 |
| **126** | 1 | 1 | 0 | 1 | 27 | 0 | 2 | 2 | 0 | 0 | 1 |
| **127** | 0 | 0 | 1 | 1 | 72 | 0 | 2 | 0 | 2 | 2 | 2 |
| **128** | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 2 |
| **129** | 0 | 1 | 0 | 1 | 71 | 1 | 0 | 1 | 1 | 1 | 0 |
| **130** | 1 | 0 | 0 | 1 | 13 | 0 | 2 | 2 | 0 | 0 | 0 |
| **131** | 1 | 0 | 1 | 0 | 25 | 1 | 0 | 1 | 1 | 1 | 1 |
| **132** | 0 | 0 | 0 | 1 | 67 | 0 | 1 | 1 | 0 | 0 | 0 |
| **133** | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| **134** | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 0 | 0 |
| **135** | 1 | 0 | 0 | 1 | 43 | 0 | 2 | 0 | 2 | 2 | 2 |
| **136** | 1 | 0 | 0 | 1 | 23 | 0 | 1 | 2 | 1 | 0 | 0 |
| **137** | 1 | 0 | 1 | 0 | 64 | 0 | 1 | 0 | 2 | 2 | 2 |
| **138** | 0 | 0 | 0 | 0 | 57 | 0 | 1 | 0 | 2 | 2 | 2 |
| **139** | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 0 |
| **140** | 1 | 1 | 1 | 0 | 72 | 0 | 2 | 1 | 1 | 1 | 1 |
| **141** | 1 | 0 | 0 | 1 | 8 | 0 | 2 | 1 | 1 | 0 | 0 |
| **142** | 1 | 0 | 1 | 1 | 61 | 0 | 2 | 2 | 0 | 1 | 0 |
| **143** | 0 | 0 | 0 | 1 | 64 | 0 | 2 | 2 | 1 | 1 | 0 |
| **144** | 0 | 1 | 1 | 1 | 71 | 0 | 2 | 0 | 2 | 2 | 2 |
| **145** | 1 | 0 | 1 | 0 | 65 | 0 | 2 | 2 | 1 | 1 | 0 |
| **146** | 0 | 0 | 0 | 1 | 3 | 0 | 1 | 0 | 2 | 2 | 2 |
| **147** | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| **148** | 0 | 0 | 0 | 0 | 30 | 0 | 1 | 1 | 0 | 1 | 1 |
| **149** | 0 | 0 | 1 | 0 | 15 | 0 | 1 | 1 | 0 | 1 | 1 |
| **150** | 1 | 0 | 1 | 0 | 8 | 0 | 1 | 1 | 0 | 0 | 0 |
| **151** | 0 | 0 | 0 | 1 | 7 | 0 | 2 | 2 | 0 | 0 | 0 |
| **152** | 1 | 0 | 1 | 0 | 70 | 0 | 2 | 2 | 1 | 1 | 1 |