Lab 7 More About Strings

1. Alphabetic Telephone Number Translator

Many companies use telephone numbers like 555-GET-FOOD so the number is easier for their customers to remember. On a standard telephone, the alphabetic letters are mapped to numbers in the following fashion:

A, B, and C = 2

D, E, and F = 3

G, H, and I = 4

J, K, and L = 5

M, N, and O = 6

P, Q, R, and S = 7

T, U, and V = 8

W, X, Y, and Z = 9

Write a program that asks the user to enter either a 10-character (domestic e.g. 555-GET-FOOD) or 11-character (international e.g. 1-800-GO-AVOXI) telephone number. The application should display the telephone number with any alphabetic characters that appeared in the original translated to their numeric equivalent in the format XXX-XXX-XXXX for a 10-character phone number and X-XXX-XXX-XXXX for an 11-character phone number.

For example, if the user enters 555-GET-FOOD, the application should display 555-438-3663.

Output example 1

```
Enter phone number: 555-GET-FOOD
555-438-3663
```

Output example 2

```
Enter phone number: 1-800-GO-AVOXI
1-800-462-8694
```

Output example 3

```
Enter phone number: 1-800-GoFedEx
1-800-463-3339
```

Output example 4

```
Enter phone number: 833-Ginger-2
833-446-4372
```

Source: Modified from Gaddis, T., & Agarwal, R.. Starting out with Python. Pearson

2. PowerBall Lottery

To play the PowerBall lottery, you buy a ticket that has five numbers in the range of 1–69, and a "PowerBall" number in the range of 1–26. (You can pick the numbers yourself, or you can let the ticket machine randomly pick them for you.) Then, on a specified date, a winning set of numbers is randomly selected by a machine. If your first five numbers match the first five winning numbers in any order, and your PowerBall number matches the winning PowerBall number, then you win the jackpot, which is a very large amount of money. If your numbers match only some of the winning numbers, you win a lesser amount, depending on how many of the winning numbers you have matched. A file named pbnumbers.txt, containing the winning PowerBall numbers that were selected between May 31, 2006 and September 29, 2018 (the file contains 1008 sets of winning numbers). Each line in the file contains the set of six numbers that were selected on a given date. The numbers are separated by a space, and the last number in each line is the PowerBall number for that day. For example, the first line in the file shows the numbers for September 29, 2018, which were 9, 17, 34, 59, 64 and the PowerBall number 22.

Write one or more programs that work with this file to perform the following:

• Display the 10 most common numbers, ordered by frequency

• Display the 10 least common numbers, ordered by frequency

• Display the 10 most overdue numbers (numbers that haven't been drawn in a long time), ordered from most overdue to least overdue

• Display the frequency of each number 1–69, and the frequency of each Powerball number 1–26

Output example

```
The 10 most common numbers and their frequencies
20:141  12:140  23:139  24:137  17:132  26:128  16:128  10:127  9:127   19:126
The 10 least common numbers and their frequencies
65:15   60:18   66:22   67:22   68:23   62:29   63:30   61:33   69:33   64:36
The 10 most overdue numbers
35      40      31      14      29      37      49      42      36      23
The frequency of each number 1–69
1:72    2:78    3:90    4:70    5:78    6:72    7:87    8:85    9:82    10:93   11:83   12:100  13:83   14:88   15:77
16:91   17:90   18:75   19:85   20:100  21:80   22:93   23:100  24:90   25:82   26:90   27:76   28:96   29:65
30:88   31:84   32:105  33:71   34:59   35:61   36:80   37:67   38:76   39:86   40:88   41:100  42:71   43:73
44:78   45:85   46:68   47:84   48:88   49:81   50:73   51:71   52:88   53:76   54:91   55:78   56:66   57:65
58:57   59:70   60:18   61:33   62:29   63:30   64:36   65:15   66:22   67:22   68:23   69:33
The frequency of each Powerball number 1–26
1:34    2:39    3:35    4:28    5:43    6:42    7:36    8:40    9:45    10:34   11:42   12:40   13:38   14:33   15:43
16:37   17:42   18:41   19:41   20:41   21:38   22:32   23:39   24:47   25:40   26:38
```

Source: Modified from Gaddis, T., & Agarwal, R.. Starting out with Python. Pearson