

## Programming Exercises

### 1. Initials

Write a program that gets a string containing a person's first, middle, and last names, and displays their first, middle, and last initials. For example, if the user enters John William Smith, the program should display J. W. S.

### 2. Date Printer

Write a program that reads a string from the user containing a date in the form mm/dd/yyyy. It should print the date in the format March 12, 2018.

### 3. 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 a 10-character telephone number in the format XXX-XXX-XXXX. The application should display the telephone number with any alphabetic characters that appeared in the original translated to their numeric equivalent.

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

### 4. Character Analysis

If you have downloaded the source code you will find a file named text.txt in the Chapter 08 folder. Write a program that reads the file's contents and determines the following:

- The number of uppercase letters in the file
- The number of lowercase letters in the file
- The number of digits in the file
- The number of whitespace characters in the file

## 5. Vowels and Consonants

Write a program with a function that accepts a string as an argument and returns the number of vowels that the string contains. The application should have another function that accepts a string as an argument and returns the number of consonants that the string contains. The application should let the user enter a string, and should display the number of vowels and the number of consonants it contains.

## 6. Course information

Write a program that creates a dictionary containing course numbers and the room numbers of the rooms where the courses meet. The dictionary should have the following key-value pairs:

Course Number (key)	Room Number (value)
CS101	3004
CS102	4501
CS103	6755
NT110	1244
CM241	1411

The program should also create a dictionary containing course numbers and the names of the instructors that teach each course. The dictionary should have the following key-value pairs:

Course Number (key)	Instructor (value)
CS101	Haynes
CS102	Alvarado
CS103	Rich
NT110	Burke
CM241	Lee

The program should also create a dictionary containing course numbers and the meeting times of each course. The dictionary should have the following key-value pairs:

Course Number (key)	Meeting Time (value)
CS101	8:00 a.m.
CS102	9:00 a.m.
CS103	10:00 a.m.
NT110	11:00 a.m.
CM241	1:00 p.m.

The program should let the user enter a course number, then it should display the course's room number, instructor, and meeting time.

## 7. File Encryption and Decryption

Write a program that uses a dictionary to assign "codes" to each letter of the alphabet. For example:

```
codes = { 'A' : '%', 'a' : '9', 'B' : '@', 'b' : '#', etc . . . }
```

Using this example, the letter A would be assigned the symbol %, the letter a would be assigned the number 9, the letter B would be assigned the symbol @, and so forth.

The program should open a specified text file, read its contents, then use the dictionary to write an encrypted version of the file's contents to a second file. Each character in the second file should contain the code for the corresponding character in the first file.

Write a second program that opens an encrypted file and displays its decrypted contents on the screen.

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Write a program that asks the user to enter a 10-character telephone number in the format XXX-XXX-XXXX. The application should display the telephone number with any alphabetic characters that appeared in the original translated to their numeric equivalent.

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### 9. Unique Words

Write a program that opens a specified text file then displays a list of all the unique words found in the file.

*Hint: Store each word as an element of a set.*

### 10. Word Frequency

Write a program that reads the contents of a text file. The program should create a dictionary in which the keys are the individual words found in the file and the values are the number of times each word appears. For example, if the word “the” appears 128 times, the dictionary would contain an element with 'the' as the key and 128 as the value. The program should either display the frequency of each word or create a second file containing a list of each word and its frequency.

### 11. Name and Email Addresses

Write a program that keeps names and email addresses in a dictionary as key-value pairs. The program should display a menu that lets the user look up a person’s email address, add a new name and email address, change an existing email address, and delete an existing name and email address. The program should pickle the dictionary and save it to a file when the user exits the program. Each time the program starts, it should retrieve the dictionary from the file and unpickle it.