COME103 / CENG111 Computer Programming I

Lab - 12 Before LAB Examples

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1. TRUE / FALSE QUESTIONS

T Sets store their elements in an unordered fashion.

F You can store duplicate elements in a set.

T The remove method raises an exception if the specified element is not found in the set.

T You would typically use a for loop to iterate over the elements in a set.

F ~~T~~ Sets are immutable.

T The set remove and discard methods behave differently only when a specified item is not found in the set.

F The union of two sets is a set that contains only the elements that appear in both sets.

T The difference of set1 and set2 is a set that contains only the elements that appear in set1 but do not appear in set2.

T The issubset() method can be used to determine whether set1 is a subset of set2.

2. COMPLETION QUESTIONS: Fill in the blanks.

a) A(n) set is an object that holds multiple unique items of data in an unordered manner.

b) The built-in function, len, returns the number of items in a set.

c) To add a single item to a set, you can use the set add method.

d) The union of two sets is a set that contains all the elements of both sets.

e) To write an object to a file, you use the dump function of the pickle module.

3. ALGORITHM WORKBENCH QUESTIONS

Write statements to do the followings:

a) Assume each of the variables set1 and set2 references a set. Write code that creates another set containing the elements that appear in set1 but not in set2, and assigns the resulting set to the variable set3.

b) Write code that retrieves and unpickles the dictionary from a file named `mydata.dat`.

MULTIPLE CHOICE QUESTIONS

4. In order to avoid `KeyError` exceptions, you can check whether a key is in the dictionary using the _____ operator.

a) ~~included~~

b) `in`

c) `isnotin`

d) `isin`

5. This operator can be used to find the union of two sets.

a) |

b) &

c) -

d) ^

6. This operator can be used to find the intersection of two sets.

a) |

b) &

c) -

d) ^

7. Which method can be used to add a group of elements to a set?

a) `add`

b) `addgroup`

c) `update`

d) `addset`

8. Which of the following does not apply to sets?

a) The stored elements can be of different data types.

b) All the elements must be unique; you cannot have two elements with the same value.

c) The elements are unordered.

d) The elements are in pairs.

9. What is the process used to convert an object to a stream of bytes that can be saved in a file?

a) Pickling

b) Streaming

c) writing

d) Dumping

PROGRAMS

10. 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.

11. **File Analysis:** Write a program that reads the contents of two text files and compares them in the following ways:
    • It should display a list of all the unique words contained in both files.
    • It should display a list of the words that appear in both files.
    • It should display a list of the words that appear in the first file but not the second.
    • It should display a list of the words that appear in the second file but not the first.
    • It should display a list of the words that appear in either the first or second file, but not both.
    Hint: Use set operations to perform these analyses.

12. **Pickled Vegetables:** Write a program that keeps vegetable names and prices in a dictionary as key-value pairs. The program should display a menu that lets the user see a list of all vegetables and their prices, add a new vegetable and price, change the price of an existing vegetable, and delete an existing vegetable and price. 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.