Lecture 23: Introduction to Computer Programming Course - CS1010

DEPARTMENT OF COMPUTER SCIENCE | 04/18/2019

Rensselaer

Announcements

- Homework 10 is due on April 23rd (Tuesday)
- Exam Review on April 25th

Goals for Today

- **Problems on Dictionaries**
- **In Class Exercise**

Object Types (Table from Previous Lectures)

Name	Type (representation)	Example
Integers	int	Whole Numbers: 1, 5 , 7500
Floating Point	float	Decimal: 2.3, 4.6, 23.15
Strings	str	Ordered sequence of characters: “hello” “Sam” “2000”
Lists	list	Ordered sequence of objects: [10, “hello”, 500.5]
Dictionary	dict	Unordered Key Value pairs: {“mykey”:”Value”, “place”: “New York”}
Tuples	tup	Ordered immutable sequence of objects: (100,”Hello”, 20.5)
Sets	set	Unordered collection of unique objects: {“a”,”b”}
Booleans	bool	Logical Value: True, False

Problem 1

- Read the text file called dict.txt from the folder code. Find the number of times each letter of the alphabet appears in the file.

Problem 2

- Given a string, return True if it has all unique characters. Otherwise return False.

Problem 3

- Given 2 strings, check if one is the permutation of the other.
- Test cases:
- str1: abcd, str2: dabc, Result: True
- Str1: abba, str2: abbd, Result:False

Problem 4

- Given a dictionary with all integer values, write a program to sort the values.

Problem 5

- Write a Python script to concatenate following dictionaries to create a new one.
- Sample Dictionary :
  dic1={1:10, 2:20}
  dic2={3:30, 4:40}
  dic3={5:50,6:60}
  Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}

Problem 6

- Write a Python program to multiply all the items (Values) in a dictionary.

Problem 7

- Write a Python program to sort a dictionary by key.

Problem 8

- According to an encryption technique called ROT-13, each letter of the alphabet is weighed down by 13 positions. For example ‘a’ becomes ‘n’, ‘b’ becomes ‘o’ and so on. We are given the key for this encryption (next slide). Write a function decode that takes two arguments, a secrete message stored as a string and a key like the one above stored as a dictionary, and returns the decoded string. Use your function to write a program that decodes the following secret message:
- Pnrfne pvcure? V zhpu cersre Pnrfne fnynq!

Problem 8

- key ={’a ’ : ’ n ’ , ’b ’ : ’ o ’ , ’ c ’ : ’ p ’ , ’d ’ : ’ q ’ , ’ e ’ : ’ r ’ , ’ f ’ : ’ s ’ ,’g ’ : ’ t ’ , ’h ’ : ’ u ’ , ’ i ’ : ’ v ’ , ’ j ’ : ’ w’ , ’k ’ : ’ x ’ , ’ l ’ : ’ y ’ ,’m’ : ’ z ’ , ’n ’ : ’ a ’ , ’o ’ : ’ b ’ , ’p ’ : ’ c ’ , ’q ’ : ’ d ’ , ’ r ’ : ’ e ’ ,’ s ’ : ’ f ’ , ’ t ’ : ’ g ’ , ’u ’ : ’ h ’ , ’v ’ : ’ i ’ , ’w’ : ’ j ’ , ’x ’ : ’ k ’ ,’y ’ : ’ l ’ , ’ z ’ : ’m’ , ’A’ : ’N’ , ’B’ : ’O’ , ’C’ : ’ P’ , ’D’ : ’Q’ ,’E’ : ’R’ , ’F ’ : ’ S ’ , ’G’ : ’ T’ , ’H’ : ’U’ , ’ I ’ : ’V’ , ’J ’ : ’W’ ,’K’ : ’X’ , ’L ’ : ’Y’ , ’M’ : ’ Z ’ , ’N’ : ’A’ , ’O’ : ’ B’ , ’P’ : ’ C’ ,’Q’ : ’D’ , ’R’ : ’ E’ , ’S ’ : ’ F’ , ’T’ : ’G’ , ’U’ : ’H’ , ’V’ : ’ I ’ ,’W’ : ’ J ’ , ’X’ : ’K’ , ’Y’ : ’ L’ , ’Z ’ : ’M’}

In Class Exercise

- Given in class