Lecture 20: Introduction to Computer Programming Course - CS1010

DEPARTMENT OF COMPUTER SCIENCE | 04/4/2019

Rensselaer

Announcements

- No Class on April 8 – Monday
- Please bring all your re-grading requests directly to me by Tuesday night (April 9 th)
- There will be no-homework posted on Monday
- Will have an extra bonus question posted on Submitty during class time.
  - One point on the final grade

Goals for today

- Problems on Sets
- In Class exercise

A | B **A.union(B)**	Returns a set which is the union of sets A and B.
A |= B **A.update(B)**	Adds all elements of array B to the set A.
A & B **A.intersection(B)**	Returns a set which is the intersection of sets A and B.
A &= B **A.intersection_update(B)**	Leaves in the set A only items that belong to the set B.
A - B **A.difference(B)**	Returns the set difference of A and B (the elements included in A, but not included in B).
A -= B **A.difference_update(B)**	Removes all elements of B from the set A.
A ^ B **A.symmetric_difference(B)**	Returns the symmetric difference of sets A and B (the elements belonging to either A or B, but not to both sets simultaneously).
A ^= B **A.symmetric_difference_update(B)**	Writes in A the symmetric difference of sets A and B.
A <= B **A.issubset(B)**	Returns true if A is a subset of B.
A >= B **A.issuperset(B)**	Returns true if B is a subset of A.
A < B	Equivalent to A <= B and A != B
A > B	Equivalent to A >= B and A != B

Set Operations

Operation	Description
len(set)	Find the length (number of elements) of the set.
set1.update(set2)	Adds the elements in set2 to set1.
set.add(value)	Adds value into the set.
set.remove(value)	Removes value from the set. Raises KeyError if value is not found.
set.pop()	Removes a random element from the set.
set.clear()	Clears all elements from the set.

Problem 1

- Write a Python Program to count the number of vowels present in a string using sets.

Problem 2

- Write a Python Program to check common letters in the two input strings.

Problem 3

- Write a program that takes two strings and displays which letters are in the first string but not in the second string.
- For example if str1 = ‘Hello World’
- Str2 =World
- Result = {‘H’, ‘e’}

Problem 4

- Write a Python Program to display which letters are present in both the strings.

Problem 5

- Write a Python Program to display which letters are in the two strings but not in both.

Problem 6

- Given a list of numbers, calculate the average of all distinct numbers.

Problem 7

- The students of District College have subscriptions to *English* and *French* newspapers. Some students have subscribed only to *English*, some have subscribed to only *French* and some have subscribed to both newspapers. How many students have subscribed to at least 1 newspaper.
- Input:
- E= {1,2,3,9,10,11,12}
- F= {4,5,6,8,9,10,11,12,13}

Problem 8

- Given sets of integers, m and n, print their symmetric difference in ascending order. The term *symmetric difference* indicates those values that exist in either m or n but do not exist in both.

Problem 9

- The top 3 most popular male names of 2018 are Oliver, Declan, and Henry according to babynames.com.

- Assume that the newly popular name ‘Atlas’ continues its meteoric rise to the top of the charts in 2019. Write a program that modifies the male_names set by removing the name Oliver and adding the name Atlas.

Problem 10

- Given 2 sets of top 10 male and female names:
- male_names = { 'John', 'Bailey', 'Charlie', 'Chuck', 'Michael', 'Samuel', 'Jayden', 'Aiden', 'Henry', 'Lucas' }
- female_names = { 'Elizabeth', 'Meghan', 'Kim', 'Khloe', 'Bailey', 'Jayden', 'Aiden', 'Britney', 'Veronica', 'Maria' }
- Write a program that does the following:
- Creates a set **all_names** that contains all of the top 10 male and all of the top 10 female names.
- A set **neutral_names** that contains only names found in both male_names and female_names.
- A set **specific_names** that contains gender specific names found only in one of the top 10 sets.

In Class Exercise

- Given in class

Next Class

- Dictionaries