Lecture 12: Introduction to Computer Programming Course - CS1010

DEPARTMENT OF COMPUTER SCIENCE | 02/25/2019

Rensselaer

Announcements

- Homework 6 will be posted tonight
- Will be due the Monday after Spring Break.
- Exam 2 is scheduled for Thursday (March 21)
- Exam 1 did not go well for many of you so I have decided the following:
  - There are 2 exams in all that make up 35 % of your overall grade
  - When calculating the final grade I will give smaller weightage to the exam you scored lower on.
  - For example if you scored lower on Exam 1 than Exam 2 then 10% will be Exam 1 and 25% will be Exam 2 and vice versa.

Goals for today

- While Loops
- Problems on While Loops

Rule to remember

- For all while loops we must:
  - Initialize
  - Give condition (of while)
  - Specify action
  - Increment and/or decrement

Problem 1

- Print numbers in the range 23 to 49 (both inclusive)

Problem 2

- Print even numbers in the range 23 to 49.

Problem 3

- Given a list that contains years from 1950 to 2020, print the years that are leap years. It is given that 1952 is a leap year.

Problem 4

- Print numbers 1 to 10 in descending order and all in one line.

Problem 5

- Print 100 stars with one character space between them.

Problem 6

- Given two lists of equal length, return a new list that contains the sum of elements of each list.
- Test Cases
- [1,2,3,4] [4,5,6,7] Result: [5,7,9,11]
- [-1,3,0] [2,-2,5] Result: [1,1,5]

Problem 7

- Print a rectangle as shown:

```
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
```

Problem 8

- You are given two lists, rat_1 and rat_2, that contain the daily weights of two rats over a period of ten days. Compare the weights of both rats and output the days on which rat 1 is heavier than rat 2.
- Test Cases:
- Rat1=[1,3,2,2,1,3,4,2,1,1]
- Rat2=[2,1,1,3,2,2,2,1,1,2]
- Output: Days=[2,3,6,7,8]

Random Numbers

- Some applications require behavior that appears random.
- Random numbers are useful particularly in games and simulations. For example, many board games use a die (one of a pair of dice) to determine how many places a player is to advance.
- A software representation of a game that involves dice would need a way to simulate the random roll of a die.

Pseudo Random Numbers

- All algorithmic random number generators actually produce pseudo random numbers, not true random numbers.
- A pseudorandom number generator has a particular period, based on the nature of the algorithm used.
- If the generator is used long enough, the pattern of numbers produced repeats itself exactly.
- All practical algorithmic pseudo random number generators have periods that are large enough for most applications

Problem 9

- Write a Python program to guess a number between 1 to 9.
- Note : User is prompted to enter a guess. If the user guesses wrong then the prompt appears again until the guess is correct, on successful guess, user will get a "Well guessed!" message, and the program will exit.

Problem 10

- Write a Python program to find numbers between 100 and 400 (both included) where each digit of a number is an even number. The numbers obtained should be printed in a comma-separated sequence.

In Class Exercise

- Given in class

Next Class

- For Loops