Structure and Interpretation of Computer Programs with Python

Lesson 5

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Quick Review

While & For Loops

While statement:

```
1  ###We want to calculate the result for 1 + 2 + 3 + ... + n
2
3  def sum(n):
4      i, result = 1, 0
5      while i <= n:
6          result = result + i
7          i = i + 1
8      return result
9
```

Execution Rule:

1. Evaluate the header's expression
2. If it is a true value, execute the (whole) suite, then return to step 1.

For loop:

```
1   sum = 0
2   for i in range(10):
3       sum = sum + i
4   print(sum)
5
```

Execution Rule:

For each value in the list, execute the (whole) suite,
then repeat for the next value.

Exercise

Write a program that takes an integer n and prints out all the multiples of 7 that's smaller than n.

(Hint: Consider using a for loop)

Exercise

Find the max n that satisfies the following:

$$1 + 2 + 3 + \ldots + n < 3000$$

Exercise

Let the computer displays a random integer between 1 and 100 and asks you to make a guess. You type a number into the system, if you are wrong, the computer should respond either "the number is too small", or "the number is too large". If you are correct, print something like "Congrats" or "You are correct!"

To use the random library: import random

To generate a random integer in range(a, b): random.randint(a, b)

To read input from user: input()

Project Day!

Create a Rock, Paper, Scissors Game

- You vs computer
- Computer generates its play using a random function
- Best 3 out of 5
- Print the message stating whether you win or lose
- Print the score for both players after each round
- After one player winning 3 times, stop the game, and display the result

Hints

1. from random import choice
2. plays = ["Rock", "Paper", "Scissors"]
3. computer = choice(plays)
4. player = input()

5. str(5)
6. = vs ==

1. Import the library
2. Create a list of plays
3. Choose one play at random using the “choice” library
4. Wait and read user input. Will not move forward until it gets an input string
5. Convert integer 5 to string “5”
6. = assigns the value on the right to the variable on the left

== compares the values and evaluates to True or False

Consider using a while loop, many if-elif-else statements. Don’t forget about indentation and :