**SENG 1000 - Software Engineering Foundations and Practice**

**Spring 2020 Midterm Exam**

**March 3, 2020, 3:30 PM to 5:00 PM, Duration: 90 minutes**

**(9 Pages, 7 Questions, 100 Marks)**

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**Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* This exam covers from Lecture 1 to Lecture 7(Data Structures List & Tuples), posted examples and Assignments.
* This exam is closed book, closed notes.
* You can use simple calculator that does arithmetic operations. No scientific calculators allowed.
* There are 7 questions worth 100 points

**Questions**

1. **(10 Points)** Answer the following
   1. **(5 Points)** What are the major components of computer? Describe each one of them in one line
   2. **(5 Points)** What is a Program? Write three steps on how program works?
2. **(15 Points)** Answer the following
   1. **(2 Points)** What is difference between Compilers and Interpreters?
   2. **(2 Points)** What are the four basic built-in datatypes of python?
   3. **(4 Points)** Identify the following valid variable names? (Write True in front of valid variables. False in front of invalid variables)

|  |  |
| --- | --- |
| **Variable name** | **True/ False** |
| a |  |
| a1 |  |
| 1a |  |
| \*\_a |  |
| \_2\_bob\_ |  |
| A\_good\_grade\_is\_A+ |  |
| Student-1 |  |
| \_1 |  |

* 1. **(2 Points)** Write any 2 Python’s reserved words.
  2. **(3 Points)** Given the following expression

A=(2+4\*5)-12/6+((2\*\*3)+8+True)+False

* What is the result of A? What is the datatype of A? What built-in function is used to find the datatype of A?
  1. **(2 Points)** What is the output of the following code?

x, y = 2, 3

x, y = y, x

print(“x = ”, x)

print(“y = ”, y)

1. **(20 Points)** Answer the following
   1. **(4 Points)** Write a Python script to print the following pattern

\*   
\* \*   
\* \* \*   
\* \* \* \*   
\* \* \* \* \*

* 1. **(2 Points)** For what values of x will this program print "True"?

if x > 1 or x <= 8:

print("True")

* 1. **(4 Points)** What is this code doing? [Hint: Look for break and continue]

while (True):

num = int(input("Enter an integer: "))

if num == 99:

break

if num % 2:

continue

print(num)

* 1. **(10 Points)** This is a program which prompts the user for 10 floating-point numbers (in a loop) and calculates their sum, product and average. Fill in appropriate code.

total = \_\_\_\_\_\_\_

product = \_\_\_\_\_\_\_

for \_\_\_\_ in range(1, \_\_\_\_\_\_):

num = \_\_\_\_\_\_(input("Please enter number " + str(i) + " : "))

total = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

product = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

average \_\_\_\_\_\_\_\_\_\_\_\_\_

print("Sum: ", \_\_\_\_\_\_\_)

print("Product: ",\_\_\_\_\_\_\_)

print("Average: ",\_\_\_\_\_\_\_)

1. **(15 Points)** Answer the following
   1. **(3 Points)** What are the benefits of code modularization using functions?
   2. **(2 Points)** What is the difference between import math and from math import \*
   3. **(10 Points)** Write a function factorial(n). Write only function definition. Handle all cases of factorial. [Note: 0! = 1, 1! = 1, 5! = 120]
2. **(15 Points)** Answer the following
   1. **(5 Points)** Write the output of the following given s = “ABRACADABRA”

* s1[-1:-4:-1])
* s1[4:1])
* s1[-4:-1])
* len(s1[-1:0:-2]))
* s1[1:4:2]
  1. **(5 Points)** Consider the following string

greeting = “Hello World from Another World”

* How do you check if “world” exists in greeting, using case-insensitive comparison?
* What does greeting.lower().find(‘world’) return?
* What is the result of greeting.split()?
  1. **(5 Points)** Print the output of the following

s1 = "ABCDEFGHIJKLMNOPKRSTUVWXYZ"

i = -1

j = -1 \* len(s1)

while i >= j:

print(s1[i:0:-2])

i -= 1

1. **(15 Points)** Answer the following
   1. **(5 Points)** What will the following program print?

months = ("January", "February", "March", "April", "May",

"June", "July", "August", "September", "October",

"November", "December")

num\_days = (31, 28, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31)

month\_dict = {}

for month, days in zip(months, num\_days):

month\_dict[month] = days

print(month\_dict)

* 1. **(5 Points)** What is the main difference between Lists and Tuples? What is the purpose it serves?
  2. **(5 Points)** Write the output of the following
* t = ()

t = 10, 20, 30, 10, 50

print(t)

print(type(t))

print(len(t))

* L = [1,2,3,4,5, 1,2,3,4, t]

print(L)

print(type(L))

print(len(L))

1. **(10 Points)** Write a python script to accept two integer numbers from the user using a prompt and print the result of all operations like shown below.

Enter first number: 6

Enter second number: 2

Addition: 6 + 2 = 8

Subtraction: 6 – 2 = 4

Multiplication: 6 \* 2 = 12

Division: 6 / 2 = 3.0

Integer Division: 6 // 2 = 3

Modulus: 6 % 2 = 0

Exponent: 6 \*\* 2 = 36