SENG 1000 - Software Engineering Foundations and Practice
Spring 2020 Midterm Exam Answers

1. **(10 Points)** Answer the following
   a. **(5 Points)** What are the major components of computer? Describe each one of them in one line

– check slides

   b. **(5 Points)** What is a Program? Write three steps on how program works?

– check slides

1. **(15 Points)** Answer the following
   a. **(2 Points)** What is difference between Compilers and Interpreters?

– check slides

   a. **(2 Points)** What are the four basic built-in datatypes of python?

– check slides

   b. **(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	**True**
a1	**True**
1a	**False**
*_a	**False**
_2_bob_	**True**
A_good_grade_is_A+	**False**
Student-1	**False**
_1	**True**

   c. **(2 Points)** Write any 2 Python's reserved words.

– check slides

   a. **(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?

37.0, Float, type(A)

   b. **(2 Points)** What is the output of the following code?

```
x, y = 2, 3
x, y = y, x
print("x = ", x)
print("y = ", y)
```

x = 3
y = 2

2. **(20 Points)** Answer the following
   a. **(4 Points)** Write a Python script to print the following pattern

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

```
for i in range(1, 6):
    print("* "*i)
```

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

```
if x > 1 or x <= 8:
    print("True")
```

The program will print "True" for any value of x.

c. **(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)
```

Program repeatedly prompts the user for an integer. If the integer is even, print the integer. If the integer is odd, don't print anything. Exit the program if the user enters the integer 99.

d. **(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     = __0.0__
product   = __1.0__

for __i__ in range(1, __11__):
    num = float(input("Please enter number " + str(i) + " : "))
    total     = __total + num__
    product   = __product * num__
average __= total / 10__

print("Sum: ", __total__)
print("Product: ", __product__)
print("Average: ", __average__)
```

3. **(15 Points)** Answer the following
   a. **(3 Points)** What are the benefits of code modularization using functions?
– check slides

b. **(2 Points)** What is the difference between `import math` and `from math import *`

— check slides

c. **(10 Points)** Write a function factorial(n). Write only function definition. Handle all cases of factorial. [Note: 0! = 1, 1! = 1, 5! = 120]

```
def factorial(n):
    fact = 1;
    for i in range(1, n+1):
        fact = fact * i
    return fact
```

4. **(15 Points)** Answer the following

a. **(5 Points)** Write the output of the following given `s = "ABRACADABRA"`
- `s1[-1:-4:-1])` **= ARBADACARB**
- `s1[4:1])` **= (this prints nothing)**
- `s1[-4:-1])`**= ABR**
- `len(s1[-1:0:-2]))` **= 5 => ABDCR**
- `s1[1:4:2]` **= BA**

b. **(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?

`"world" in greeting.lower()`

- What does `greeting.lower().find('world')` return?

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- What is the result of `greeting.split()`?

`['Hello', 'World', 'from', 'Another', 'World']`

c. **(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
```

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YWUSKOMKIGEC
XVTRPNLJHFDB

5. **(15 Points)** Answer the following
   a. **(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)
```

{'January': 31, 'February': 28, 'March': 31, 'April': 30, 'May': 31, 'June': 30, 'July': 31, 'August': 31, 'September': 30, 'October': 31, 'November': 30, 'December': 31}

   b. **(5 Points)** What is the main difference between Lists and Tuples? What is the purpose it serves?

– check slides

   c. **(5 Points)** Write the output of the following
      - `t = ()`

```
t = 10, 20, 30, 10, 50
print(t)
print(type(t))
print(len(t))
```

(10, 20, 30, 10, 50)
<class 'tuple'>
5

- ```
  L = [1,2,3,4,5, 1,2,3,4, t]
  print(L)
  print(type(L))
  print(len(L))
  ```

[1, 2, 3, 4, 5, 1, 2, 3, 4, (10, 20, 30, 10, 50)]
<class 'list'>
10

6. **(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

– check assignment solution