## THE UNIVERSITY OF WESTERN ONTARIO LONDON, CANADA

**Computer Science 1026a** 

### **MIDTERM EXAMINATION**

OCTOBER 27, 2018

2 Hours: 3:00pm-5:00pm

# **SOLUTIONS**

Question	Out of	Mark
Section 1: Scantron		
1. True/False	15	
2. Multiple Choice	40	
Section 1 Total Marks	55	
Section 2: On Exam		
3. Logic Errors	12	
4. A Little Code	33	
Section 2 Total Marks	45	
Total	100	

## **SECTION 1**

Answer questions in PART 1 and PART 2 on the scantron provided. Any markings you make on the pages on the question booklet for PART 1 and PART 2 <u>WILL</u>

<u>NOT</u> be graded

## Question 1: True/False - 15 Marks (1 each)

For the following questions, please circle (or indicate as specified by the question) your answer directly on the exam sheet. Note that questions are each worth one point unless otherwise indicated.

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use the name w velout	l th	e loca thin
1) A variable in Python has a name and a location (memory).	<b>True</b>	False
2) Python can have variables that hold integer values.	<u>True</u>	False
3) Boolean variables can only have a value of True or False.	True	False
4) Compilers translate source code into byte code.	<u>True</u>	False
5) The first position in a string in Python has the index 0.	<u>True</u>	False
6) The symbol '#' is used in Python to indicate a comment.	<u>True</u>	False
7) X3yZ is a valid variable name in Pothon.	True	False
8) 9.7E05 is a floating number in Python.	True	False
9) The keyword <b>def</b> is used to define a function in Python.	True	False
10) The assignment operator in Python is .	<u>True</u>	False
11) To divide two integers to get an integer result, you can use //.	<u>True</u>	False
he keyword <b>elseif</b> can be used in if-statements in Python.	<b>True</b>	False
13) The operator + can be used to concatenate two strings together.	<b>True</b>	False
14) In Python, lists are mutable.	True	<u>False</u>
15) 45 % 8 produces the result 8.	<u>True</u>	False
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## Question 2: Multiple Choice - 40 Marks (2 each)

- 16) Which of the following statements is/are TKUE about the CPU?
  - a. CPU stands for Central Processing Unit
  - b. The CPU is what performs computation
  - c. The CPU processes machine language
  - d. At least two of the above statements are true
  - e. None of the above are true
- 17) What are two of the most important benefits of the Python language?
  - a. Advanced mathematical equations and fast programs
  - b. Ease of use and fast programs
  - c. Ease of use and portability
  - d. Fast programs and smaller programs
- 18) Which statement(s) allows us to initialize the list numbers with 10 elements all set to zero?
  - a. numbers = [0]
  - b. numbers[10] = 0
  - c.  $\underline{\text{numbers}} = [0] * 10$
  - d. numbers[10] = [0] \* 10
- 19) Which of the following subtracts a variable x from a variable y, divides their difference by 3 and adds 11 to the result:

a. 
$$((x - y) / 3) + 11$$

c. 
$$y - x / 3 + 11$$

d. 
$$(y - x) / 3 + 11$$

- e. None of the above are true
- 20) What will be the values of the variables num1 and num2 after the execution of the following assignments?

$$num1 = 21$$

$$num2 = 18$$

$$num1 = num1 + num2 // 2$$

$$num2 = num1$$

- a. num1 is 21, num2 is 21
- b. <u>num1 is 30, num2 is 30</u>
- c. num1 is 30, num2 is 21
- d. num1 is 30, num2 is 18
- e. None of the above.

- 21) Which statement correctly creates a list that contains four elements?
  - a. values[4]
  - b. values = [4]

  - c. values = [1, 2, 3, 4]
    d. value[4] = [1, 2, 3, 4]

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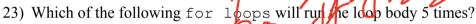
22) The following code snippet contains an error. What is the error?

```
cost = int(input("Enter the cost: "))
if cost > 100
   cost = cost - 10
print("Discounted cost:", cost)
```

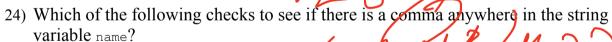
a. Logical error: use of an uninitialized variable

b. Syntax error: missing colon after if statement

- c. Syntax error: missing an else statement
- d. Logical error: error in conventing impul



- a. for i in range (1/3, 1/9, 1/9)
- b. for i in range (14)
- c. for i in range (15,
- d. for i in range (14



- a. if name.contains(",") :
- b. if "," not in name :/
- c. if name.startswith(",") :
- d. if "," in name :
- 25) Which of the following statements is true about functions and strings:
  - a. A function can be called with a string as an argument.
  - b. A function can return a string.
  - c. Only a. is true.
  - d. Only b. is true.
  - e. Both a. and b. are true.

3.12,11,10

26) What does the following code snippet output?

```
a = 7
b = 8
def fun(b,a):
    a=9
    b=8
    return a
```

fun(a,b)
print(a,b)

- a. <u>7 8</u>
- b. 8 9
- c. 9 9
- d. 8 8
- e. None of the above

27) What is the value of names after the following code segment has run?

(2) ROW

```
names = []
names.append("Amy")
names.append("Bob")
names.pop()
names.append("Peg")
names[0] = "Cy"
```

names.insert(0, "Ravi")
names.insert(4, "Savannah")

- a. ["Amy", "Ravi", "Cy", "Peg", "Savannah"]
- b. ["Ravi", "Cy", " Peg", "Savannah"]
- c. ["Cy", "Bob", "Peg", "Savannah",]
- d. ["Ravi", "Amy", "Bob", "Savannah", "Peg"]

- 28) What is the output of the code snippet given below?
  - s = "zvxwv"length = len(s)while i <= length
    - print(s[i-1], s[length i]) i = i + 1
  - a. zx УW
  - b. zy WV
  - c. zx УV
  - d. zv <u>yw</u>
- 29) What is printed by the following code snippet?

name = "This is London Ontario" name = name.lower() name = name.replace("o", "#") name.upper()

- print(name)
- a. "THIS IS LONDON ONTARIO"
- b. "THIS IS L#ND#N #NTARI#"
- c. "This is L#nd#n #ntari#"
- d. "this is l#nd#n #ntari#"
- 30) What is printed to the screen when this loop executes?

for i in range (24, 3,print(i, end =

- a. 24-17-10-3-
- b. 24-17-10-3
- c. 24 17 10-
- d. <u>24-17-10-</u>

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31) What is printed from the following code snippet?

```
prices = [[10, 3.50, 7.50],
      [10.0, 30.50, 70.50],
      [100.0, 600.50, 700.50],
      [1000.0, 3000.50, 7000.50]]
print(prices[2][1])

a. 10.0
b. 30.50
c. 100.00
d. 300.50
```

#### Use the following code for the next three questions (i.e. questions 32 - 34)

```
num1 = int(input("Enter a number: "))
num2 = int(input("Enter a number: "))
num3 = int(input("Enter a number: "))
if not (num1 > num2 and num1 >= num3) :
    print("First num is", num1)
elif not(num2 > num1 and num2 > num3) :
    if num2 % 10 == 0:
        print("The value is", num2)
    elif num1 % 10 == 0:
        print("The value is", num1)
    else:
        print("The value is", num3)
elif not (num3 > num1 or num3 > num2) :
    print(num3)
```

- 32) Assuming a user enters 5, 10, and 15 as the input, what is the output of the above code snippet?
  - a. The value is 10
  - b. First num is 3
  - c. 15
  - d. The value is 15

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33) Assuming a user enters 15, 10, and 5 as the input, what is the output of the above code snippet?

- a. First num is 15
- b. The value is 10
- c. 5
- d. The value is 15

34) Assuming a user enters 7, 7, and 6 as the input, what is the output of the following code snippet?

- a. First num is 7
- b. The value is
- c. 6
- d. The value is 6

35) What is the output of the following code snippet.

def myCalculator(x):

$$i = 4$$

$$x = 3$$

$$y = 2$$

while i > 0:

$$y = y + n$$

$$x = x + y = 3$$

$$i = i - 1$$

return x

print (myCalculator(3))



- a) 10
- b) <u>11</u>
- c) 12
- d) 13

## **SECTION 2**

Answer questions in PART 3 AND PART 4 in **this** booklet. Answers recorded in any other location **WILL NOT** be graded

## **Question 3: Logic Errors - Correcting Code Segments - 12 Marks**

The function substring determines the position in a given string where another string occurs as a substring. For example, the string "ab" occurs in the string "abab" at positions 0 and 2. The function takes two parameters: str which is the given string and s which is the substring to look for. The function returns a list of the positions in str in which s occurs.

The function is syntactically correct but has four (4) incorrect lines of code which contain logic errors that prevent it from computing correctly. Identify the lines and correct them Note: a line may contain more than one logic error. Examples of a main program that uses the function, *when it is correctly implemented*, and sample output are also provided. (12 Marks)

## Each error is 3 marks

```
# Function to determine positions of a substring
# in another string
def substring(str,s):
    posns = []
    for i in range (len(str)-len(s)+1):
        j = 1
                                             # j = 0
         done = False
         while j < len(s)-1 and not done: # j < len(s)</pre>
             if str[k] == s[j]:
                 k += 1
                 j += 1
             else:
                 done = True
         if done:
                                             # not done
                                             # i
             posns.append(k)
    return posns
# main program
str = "abab"
s = "ab"
lst = substring(str,s)
print(lst)
str = "abbbaab"
s = "bb"
lst = substring(str,s)
print(lst)
Output
[0, 2]
[1, 2]
```

## Question 4: A Little Code - 33 Marks

4.1) Create a function countZeros that counts the number of zeros in an integer. For example, if the integer is 90120, then the function would return 2. Provide your code for the function below (12 Marks).

#### *NOTE:* This is *ONE* solution – there are a number of ways to provide this code!

4.2) Create a function removePunc that takes a word containing letters, digits and punctuation and removes all the punctuation and returns a new word with no punctuation. The punctuation to consider is defined in the constant PUNC below. For example, if the word is "London's.", then the function would return "Londons". Provide your code for the function below (10 Marks).

## NOTE: This is ONE solution – there are a number of ways to provide this code!

4.3) Create a function wordList that takes a line of text (a sentence) and splits it into words and returns a list of words where each word has no punctuation. This function should make use of the function removePunc that was defined above (4.2). Provide your code for the function below (11 Marks).

## NOTE: This is ONE solution – there are a number of ways to provide this code!

```
def wordList(line):
    words = []  # 1 for initialization
    lst = line.split()  # 2 for splitting line
    for w in lst:  # 1 for loop through list
        w = removePunc(w)  # 3 correct use
    of"removePunc"
        words.append(w)  # 3 for correct append
    return words  # 1 for return
```