



Eastern
Mediterranean
University

Name:: _____ **SOLUTION** _____

Signature:: _____ Group No: _____ Student No:: _____

CMPE-CMSE 107 Foundations of Computer-Software Engineering

Spring-2021-22 (28-04-2022) Midterm Exam

Asst. Prof. Dr. Cem Ergün, Group 1;
Assoc. Prof. Dr. Adnan Acan, Group 2;
John Olorunfemi Olaife, Group 3

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Total

Total five pages (including the cover page), four parts, 95 minutes.

- Answers that are not written into the given boxes WILL NOT BE GRADED.
- Student who ATTEMPT TO CHEATING will GET ZERO for the exam, and may be directed to disciplinary investigation for further punishment. Sharing pen, pencil, eraser, and sharpeners is considered as attempt to cheating.
- Remove all notes, books and unnecessary objects from your desk.
Keep only THIS BOOKLET, PEN-PENCIL-ERASES AND YOUR ID CARD on your desk.
- Having any kind of electronic calculators, computers, phones and gadgets such as earphones, intelligent watches etc. at any easy accessible place is strictly not allowed. You are allowed to keep electronics gadgets in your bags after turning their power off.
Do not keep electronic watches on your wrist, desk, or in your pocket.
- Talking, making any kind of noise, asking questions are not allowed. Do not talk, and do not create any sound once the exam is started.

Course Student Outcome relations:

Questions in PartA and B -Identify the difference between computer hardware and computer software (CO1)

Questions in PartD -Construct an algorithm for solving a computational problem (CO2 CO3)

Questions in PartC - Creating lists and other data structures for storing and manipulation of data (CO6)

Questions in PartC and D -Write a complete Python program for solving a problem (CO4)

Questions in PartC -Use of selection and repetition structures within a Python Program (CO5)

PART A: (Each is 1pt)**MULTIPLE CHOICE (Mark only one choice)****QA1)** Computer output can be _____.

- Sound
 RAM
 UPS
 Keyboard

QA2) Computer hardware comprises

- applications and programs used by your computer
 files stored on your computer
 the physical parts of a computer system
 the master system of programs that manage the basic operations

QA3) Which of the followings are all input devices?

- Mouse, touchscreen, keyboard, microphone
 Mouse, printer, keyboard, speakers
 Monitor, printer, mouse, microphone
 Microphone, mouse, keyboard, speakers

QA4) What are the basic operations which are performed by a CPU??

- Arithmetic operations
 Logical operations
 Fetch Decode and Execute
 All of the above

QA5) A storage device the loses its contents when the power is off is

- Nonvolatile
 Permanent
 External
 Volatile

QA6) Computational problem solving involves two fundamental descriptions. They are:

- Hardware-Software
 Input-Output
 Representation-Algorithm
 Binary – Decimal number systems.

QA7) Which provides the fastest data access time?

- USB Memory
 RAM
 CD-ROM
 Hard disk

QA8) A device-specific software that is used to enable communication between a computer and an external device is called

- Operating system
 Internet
 Driver
 Application software

QA9) A category of software is _____ software

- advanced
 system
 compilation
 bit

QA10) In computational problem solving, leaving out useless details is called _____

- adapting
 abstraction
 translation
 algorithm

QA11) An algorithm MUST provide results in a _____ amount of time?

- finite
 infinite
 systematic
 immediate

QA12) Python uses

- Static-typing
 Dynamic-typing
 Immutable-typing
 Mutable-typing

QA13) Which of the following is a valid identifier?

- Sum
 3person
 for
 None of the above

QA14) In operator precedence, the highest order is given to

- Arithmetic operators
 Relational operators
 Boolean operators
 None of the above

QA15) All information within a computer system is represented by the use of

- Graphs, charts and complex algorithmic languages.
 Only two digits, 0 and 1.
 Decimal digits, 0 – 9.
 Alphabetical letters.

QA16) The software that translates high-level programming language commands into machine language commands is called

- a compiler.
 an assembler.
 an operating system.
 a driver.

PART B: FILL IN BLANKS QUESTIONS

(Each is 2pts)

Write answers only into the answering box.

QB1) A _____ is a sequence of one or more characters that can stand for itself

Answer ???:
Literal/ identifier

QB2) _____ are special characters that are not displayed, but control the display of other characters on the screen?

Answer ???:
Control characters

QB3) The ability that a variable can be assigned values of different types is referred to as _____.

Answer ???:
Dynamic typing

QB4) An _____ is the software that manages and interacts with the hardware resources of a computer.

Answer ???:
Operating system

QB5) The _____ function is used to display information on the screen in Python?

Answer ???:
print

QB6) Given that $22/7 = 3.142857142857143$, `print(format(0.1*22/7, '.3e'))` displays ???

Answer ???:
3.143e-01

QB7) _____ is a finite number of clearly described, unambiguous, “doable” steps that can be systematically followed to produce a desired result for given input in a finite amount of time.

Answer ???:
Algorithm

QB8) A conditional statement is evaluated to be _____ or _____.

Answer ???:
True or False

QB9) `**` (exponential) operator has _____ associativity.

Answer ???:
Right to left

QB10) `ListA[-1]` represents _____ element of `ListA`.

Answer ???:
Last, rightmost

Q11) `ListA + ListB` results in _____ of the two lists.

Answer ???:
Concatenation , join

QB12) _____ operation adds a new value in a list at the specified index value

Answer ???:
insert

QB13) _____ operation adds a provided value to the end of the list

Answer ???:
append

QB14) Lists in Python as _____, which means that the contents of the list may be altered.

Answer ???:
mutable

QB15) _____ are the same as lists in Python, with the exception that they are immutable.

Answer ???:
Tuples

QB16) _____ statements are used for the construction of definite loops only.

Answer ???:
for

QB17) The built-in _____ function in Python can be used for generating a sequence of integers.

Answer ???:
range

QB18) Examine the following lines of Python code:

```
lst1 = [1, 2, 3, 4]
lst2 = lst1
lst1 [0] = 10
lst1 == lst2
```

What will the last line return?

Answer ???:
True

QB19) What will be the output of the following loop?

```
n = 5
while n > 4:
    print(n, end='')
    n=n-1
print('n')
```

Answer ???:
5n

PART C: FILL IN BLANKS QUESTIONS

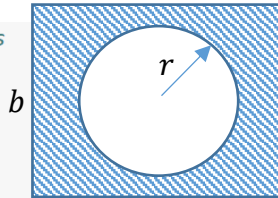
Write answers only into the answering box.

QC1) (2pts) The following python code is prepared to compute the **Area of the shaded space (AoSh)**. Fill the missing statements 1 and 2 accordingly to compute AoSh.

Area of circle (AoC) = $3.142 \times r^2$,

Area of rectangle (AoR) = $l \times b$.

```
#assigned values for objects
l=5
b=4
r=1.5
# calculate area of circle
AoC = _____ a? _____
#calculate the area of rectangle
AoR = l x b
AoSh = _____ b? _____
```



Answer a?: **3.142 x (r**r)**
 Answer b?: **AoR-AoC**

QC2) (3pts) Complete the code below to print each fruit and its cost in the order given in the output.

The price of apple is 7 TL
 The price of cashew is 18 TL
 The price of grapes is 6 TL
 The price of banana is 17 TL
 The price of mango is 16 TL
 The price of orange is 9 TL

```
Fruits = ['apple', 'cashew', 'grapes', 'banana', 'mango', 'orange']
Costs = [7, 18, 6, 17, 16, 9]
for item in _____ a? _____:
    print("The price of", _____ b? _____, "is", _____ c? _____, "TL")
```

Answer a?: **range(len(Fruits))** or **range(len(Costs))**
 Answer b?: **Fruits[item]**
 Answer c?: **Costs[item]**

QC3) (2pts) Complete the following code to add two cities to the empty list Cities.

```
Cities=[]
number=2
while number >0:
    item=input("please enter City name: ")
    _____
    number -=1
print(Cities)
```

Answer : **Cities.append(item)**

QC4) (4pts) The following program is prepared to compute factorials of integers from 0 to 50. Complete the empty lines for this purpose.

```
FactList=[]
FactList.append(1) # 0!
FactList.append(1) # 1!
for i in range(2,51):
    .....1?.....
    .....2?.....
```

Answer 1: **Fact=FactList[-1]*i**
 Answer 2: **FactList.append(Fact)**

QC5) (4pts) The following program is prepared to remove repeated elements from a list ListA and obtain a new list ListB of unique elements. Complete the empty lines for this purpose.

```
# Remove repeated elements from a List
ListA=[1,1,3,2,3,4,5,4,5,6,7,7,8,4,3,9]
ListB=[]
for i in ListA:
    if .....1?.....
        .....2?.....
print(ListB)
```

Answer 1: **i not in ListB:**
 Answer 2: **ListB.append(i)**

QC6) (2pts)The following program is prepared to change the element “abcd” with 100 in the given list ListA. Complete the empty lines for this purpose.

```
ListA=[[8,[10,[1,2,"abcd",9],5],4],3]
```

Answer ???: **ListA[0][1][1][2]=100**

QC7) (4pts) The following program is prepared to check if digit 5 is present in an input integer of any number of digits. Complete the empty lines for this purpose.

```
N=int(input("Enter an integer number"))
StringN= .....1?.....
if .....2?.....
    print("Digit 5 is present in the input integer")
else:
    print("Digit 5 is not present in the input integer")
```

Answer 1: **str(N)**
 Answer 2: **"5" in StringN:**

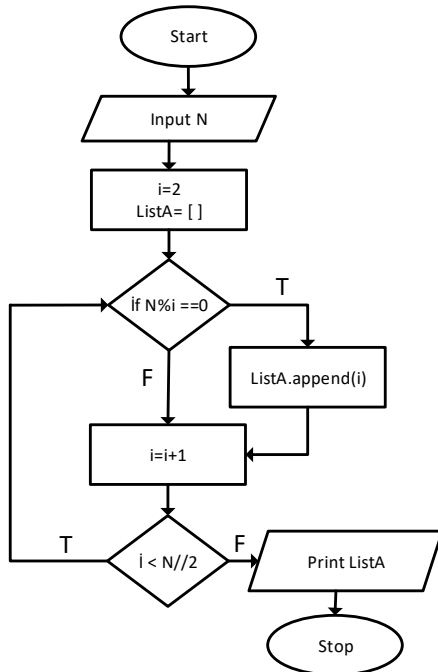
QC8) (6pts) The following program is prepared to check if an input string contains the characters “C”, “M” in this order, and if so it prints their first occurrence indexes. Complete the empty lines (labeled as 1,2,3) for this purpose.

```
S=input("Enter a string of length 4 or above:")
if len(S) < 4:
    print("Insufficient string length")
else:
    FoundFlag=True
    if S.count("C")==0:
        FoundFlag=False
    else:
        IndexC=.....1?.....
        if .....2?..... ==0:
            FoundFlag=False
        else:
            IndexM= .....3?.....
            print(IndexC, IndexM)
    if not FoundFlag:
        print("C and M are not found in this order")
```

Answer 1: **S.index("C")**
 Answer 2: **S[IndexC+1:].count("M")**
 Answer 3: **IndexC+1+S[IndexC+1:].index("M")**

PART D: FILL IN BLANKS CODING QUESTIONS

QD1) (15pts) The following flowchart calculates and lists the numbers that evenly divides input N, write the corresponding Python program according to the flowchart.



Write your code here

QD2) (12pts) Given the following algorithm, write the corresponding Python program

Algorithm

1. Input A,B,C
2. $\Delta = B^2 - 4.0 * A * C$
3. If $\Delta < 0$:
 - a. Print("No real roots")
4. Else:
 - a. If $\Delta = 0$
 - b. Print("One real root: ", $-B/(2*A)$)
 - c. Else:
 - d. Print("Two real roots: ")
 - e. Print("Root1: ", $(-B + \Delta^{0.5}) / (2*A)$)
 - f. Print("Root2:", $(-B - \Delta^{0.5}) / (2*A)$)

```

import math
a, b, c = input("Enter quadratic eqn parameters \
                'three numbers with space': ").split()
a, b, c = [int(a), int(b), int(c)]

D=b*b-4*a*c # Discriminant calc.
if D<0:
    print('no real roots')
else:
    if D == 0:
        r1= -b/ (2*a)
        print('One root only, r1= ', r1 )
    else:
        r1=(-b+math.sqrt(D))/(2*a)
        r2=(-b-math.sqrt(D))/(2*a)
        print("r1= %.3f r2= %.3f" %(r1, r2))
    
```