**Information and Computer Science Department**

**ICS 104: Introduction to Programming in Python and C**

**Final Exam, Term 213**

**Wednesday, August 10, 2022**

**Duration: 150 minutes**

**Code 002**

**Name:**

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| **ID:**  |  |  |  |  |  |  |  |  |  |

**Instructor Section: Select one**

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| --- | --- |
| **Instructor** | **Section** |
| Dr ADAM SALAHADIN |  [ ] 1 (UMTW 8:10 – 9:00)  |
| Dr. WASFI AL-KHATIB |  [ ] 2 (UMTW 9:20 – 10:10) |
| Dr. MAHMOOD NIAZI |  [ ] 3 (UMTW 10:30 – 11:20)  [ ] 13 (UMTW 1:00 – 1:50) [ ] 14 (UMTW 12:00 – 12:50) |
| Dr. HUSNI AL-MUHTASEB |  [ ] 4 (UMTW 12:00 – 12:50)  [ ] 11 (UMTW 9:20 – 10:10) [ ] 12 (UMTW 11:00 – 11:50) |
| Dr. AHMAD AL-HERZ |  [ ] 5 (UMTW 13:00 – 13:50)  [ ] 7 (UMTW 9:20 – 10:10) [ ] 9 (UMTW 12:00 – 12:50) |
| Mr. YAHYA GAROUT |  [ ] 15 (UMTW 8:10 – 9:00) |

**Instructions**:

* Write your name, ID, and Section # on
	+ This page.
	+ The upper left corner of the green answer sheet.
* Bubble your ID, Section number and Test Code number on the green sheet, and make sure that the bubbles match with the numbers that you wrote/checked on this page.
* Write your name and ID number on the white Answer Sheet.
* **Parts 1 & 2.** Use the green sheet to answer the 40 multiple choice questions.
	+ Use HB2.5 pencils only.
	+ Use a good eraser. DO NOT use erasers attached to the pencil. If you erase a bubble, make sure that you do not leave any trace of penciling.
	+ When bubbling your answers, make sure that the bubbled space is fully covered.
* **Part 3.** Use the white answer sheet to answer the Code Writing questions.
* The exam is closed book and closed notes.
* Make sure that the exam consists of 15 pages (including this page).
* All types of calculators, pagers or mobile phones are not allowed during the exam.
* Make sure to turn off your mobile phone and keep it under your seat.

**Part 1 : Python Language MCQs [ 30 x 1.5 = 45 points ]: (Make sure to bubble the correct answer in the green sheet)**

1) Which of the following raises FileNotFoundError exception in a Python program:

|  |  |
| --- | --- |
| a) | Open a non-existing file for reading |
| b) | Open a non-existing file for writing |
| c) | Writing to an empty file |
| d) | Reading from an empty file |

2) What is true about encapsulation?

|  |  |
| --- | --- |
| a) | Encapsulation enables changes in the implementation that affects users of a class. |
| b) | Encapsulation is the act of providing a private interface and exposing the implementation details. |
| c) | Encapsulation is an act in which all instance variables are private and are only manipulated with methods. |
| d) | When encapsulation is used, all methods are made private. |

3) What will be the output of the following Python code fragment?

var1 = [1, 2, 3]

var2 = [4, 5, 6]

var3 = var1 + var2

print(var3)

|  |  |
| --- | --- |
| a) | [1, 2, 3, 4, 5, 6] |
| b) | [5, 7, 9] |
| c) | [4, 5, 6, 1, 2, 3] |
| d) | This code will generate an error |

4) The following function is supposed to compute the area of a triangle and return the area as the function's result. What line of code must be inserted to achieve this goal?

def triangleArea(base, height) :

 area = base \* height / 2

 # Line of code to be inserted.

|  |  |
| --- | --- |
| a) | print area |
| b) | print(area) |
| c) | return area |
| d) | return triangleArea |

5) What is true about a constructor?

|  |  |
| --- | --- |
| a) | A constructor has to be invoked explicitly by a programmer |
| b) | There can be more than one constructor in a class, and the first one is the default. |
| c) | A constructor defines and initializes local variables in a method. |
| d) | There can be only one constructor in a class |

6) What will be the output if you try to run the following python code?

n = 5

m = 2

if m + n > 0 or m / (n - 5) > 0:

 print("m + n = %d" % (m + n))

else:

 print("m - n = %d"%(m - n))

|  |  |
| --- | --- |
|  | Syntax error message |
|  | Division by zero error message |
|  | m + n = 7 |
|  | m - n = 3 |

7) What will be the output of the following code fragment?

a = "October"

b = "July"

c = "January"

if a < b:

 print("b1", end = "")

if b < c:

 print("b2", end = "")

elif a < c:

 print("b3", end = "")

else:

 print("b4", end = "")

|  |  |
| --- | --- |
|  | b1b3 |
|  | b1b2b3b4 |
|  | b4 |
|  | b1b2b3 |

8) What will be the output of the following code fragment?

def myFun(perfect) :

perfect = 0

return ((perfect - 1) \* (perfect - 1))

def main() :

for i in range(4) :

 print(myFun(i), end = " ")

main()

|  |  |
| --- | --- |
| a) | 1 1 1 1 |
| b) | -1 0 1 4 |
| c) | 0 0 0 0 |
| d) | 1 0 1 4 |

9) Which of the following is true about “finally clause” in Python?

|  |  |
| --- | --- |
| a) | Its code is executed only if no exception is raised. |
| b) | Its code is executed only if an exception is raised. |
| c) | Its code is always executed when the try block is entered. |
| d) | Its code is always executed even if the try block was not entered. |

10) What will be the output of the following code fragment?

def func(x):

 print('x is', x)

 x = 2

 print('Changed local x to', x)

x = 50

func(x)

print('x is now', x)

|  |  |
| --- | --- |
| a) | x is 50Changed local x to 2x is now 50 |
| b) | x is 50Changed local x to 2x is now 2 |
| c) | x is 50Changed local x to 2x is now 100 |
| d) | None of the answers is correct |

11) What will be the output of the following code segment?

def main() :

 a = 10

 print(doTwice(a))

def doTwice(x) :

 x = x \* 2

 x = x \* 2

 return x

main()

|  |  |
| --- | --- |
| a) | 2 |
| b) | 20 |
| c) | 40 |
| d) | 10 |

12) What is wrong with the following Python code fragment?

mystery(10, 2)

def mystery(num1, num2) :

 result = num1 \*\* num2

 return result

|  |  |
| --- | --- |
| a) | nothing, it will return 20 |
| b) | nothing, it will return 100 |
| c) | a variable must be used to store the result of the function call |
| d) | the function must be defined before the statement that calls it |

13) What is true about the parameter variable self of a method?

|  |  |
| --- | --- |
| a) | It is assigned an object |
| b) | It is an optional parameter |
| c) | It is manually assigned by a programmer |
| d) | Used as a reference to an object to access its instance variables |

14) What will be the output of the following program?

infile = open("input.txt","r")

for line in infile:

 line = line.rstrip("\n4on")

 wordList = line.split()

 for word in wordList:

 print(word)

infile.close()

**The content of the input.txt file is:**

ICS 104

Introduction to Programming

|  |  |
| --- | --- |
| a) | ICS104IntroductiontoProgramming |
| b) | ICS10 |
| c) | ICS 10IntroductiotoProgramming |
| d) | ICS10IntroductiontoProgramming |

15) Assume the variable strings is a list of strings, which of the following is the correct way to transform the strings in that list to upper case in Python?

|  |  |
| --- | --- |
| a) | for indx in range(len(strings)): strings[indx] = strings[indx].upper() |
| b) | for indx in strings: indx = indx.upper() |
| c) | for indx in range(len(strings)): indx = indx.upper() |
| d) | for indx in range(len(strings)): strings[indx].upper() |

16) What will be the output of the following Python code fragment?

mDic = {"A": 1, "B": 2}

mDic["B"] = mDic["B"] + 1

print(mDic)

|  |  |
| --- | --- |
| a) | {"A": 1, "B": 2} |
| b) | {"A": 1, "B": 2, "C": 0} |
| c) | {"A": 1, "B": 3} |
| d) | This code will generate an error |

17) What will be the output of the following program?

infile = open("input.txt","r")

line = infile.readline()

print(len(line),end=" ")

line = infile.readline()

print(len(line.lstrip()),end=" ")

line = infile.readline()

print(len(line.lstrip()))

infile.close()

**The content of the input.txt file is:**

Hello

World!

|  |  |
| --- | --- |
| a) | 5 6 0 |
| b) | 5 7 1 |
| c) | 6 7 1 |
| d) | 6 7 0 |

18) What will be the output of the following Python code fragment?

aLst = ['a', 'b', 'c', 'd']

elem = aLst.pop(2)

aLst.pop()

aLst.append(elem)

print(aLst)

|  |  |
| --- | --- |
| a) | ['a', 'c', 'b'] |
| b) | ['a', 'b', 'c'] |
| c) | ['a', 'c', 'd'] |
| d) | This code will generate an error |

19) What will be the output of the following program if myInput is 10plus3?

 try:

 myInput = input("Enter a number: ")

 value = int(myInput)

 print("The number is ", value)

 value = value / 0

except ArithmeticError:

 print("Error: division by zero")

except ValueError:

 print("Error: the input is not a number")

|  |  |
| --- | --- |
| a) | The number is 10 |
| b) | Error: division by zero |
| c) | Error: division by zeroError: the input is not a number |
| d) | Error: the input is not a number |

20) What will be the output of the following program?

c = 0

while (c <= 1):

 try:

 1 / c

 except:

 print('exception')

 finally:

 print('finally')

 c = c + 1

|  |  |
| --- | --- |
| a) | exception |
| b) | exception finally |
| c) | exceptionfinallyfinally |
| d) | finallyfinally  |

21) What is the output of the following program:

class myClass:

 def \_\_init\_\_(self, x = 2, y = 3):

 self.a = x

 self.b = y

 def toList(self):

 return [self.a,self.b]

obj1 = myClass()

obj2 = myClass(4.5)

print(obj1.toList(), obj2.toList())

|  |  |
| --- | --- |
| a) | [] [4.5] |
| b) | [2,3] [4.5,3] |
| c) | [0,0] [4.5,0] |
| d) | Generates an error |

22) Select the correct option based on the below python code.

richter = 3

if richter >= 7:

 print("Most structures fail")

if richter > 3:

 print("Many buildings destroyed")

else:

 if richter == 3.0:

 print("No destruction of buildings")

|  |  |
| --- | --- |
|  | No output is generated  |
|  | Program will give syntax error. |
|  | Program will print "Most structures fail". |
|  | Program will print "No destruction of buildings".  |

23) What is the output of the following program:

class myClass:

 def \_\_init\_\_(self):

 self.v = 0

 def method1(self):

 self.v = self.v - 2

 def method2(self,n):

 for i in range(n):

 self.v = self.v + 1

 return self.v

a = myClass ()

b = myClass ()

a.method1()

print(a.method2(4),b.method2(4))

|  |  |
| --- | --- |
| a) | 4 4 |
| b) | 2 4 |
| c) | 2 2 |
| d) | 4 2 |

24) What is the output of the following program:

class myClass:

 def method1(self,n):

 for i in range(n):

 self.v = self.v + 1

 def method2(self):

 return self.v

a = myClass()

a.method1(2)

print(a.method2())

|  |  |
| --- | --- |
| a) | 2 |
| b) | 3 |
| c) | 1 |
| d) | Generates an error |

25) What will be the output of the following Python code fragment?

def funct(data1, data2):

 data3 = []

 for indx in range(len(data1)):

 data3.append(data1[indx] + data2[indx])

 return data3

data = funct([4,5,3],[3,4,5])

print(data)

|  |  |
| --- | --- |
| a) | 24 |
| b) | [4, 5, 3, 3, 4, 5] |
| c) | [3, 4, 5] |
| d) | [7, 9, 8] |

26) Using the following variables

names = "Adam Ali Basel Badr"

scores = "12 3 12 4"

namesList = names.split( )

scoresList = scores.split( )

 which of the following code segments will result in creating the following dictionary?

dict1 = {'Adam': '12', 'Ali': '3', 'Basel': '12', 'Badr': '4'}

|  |  |
| --- | --- |
| a) | dict1 = dict(names, scores) |
| b) | dict1 = {}for indx in namesList: dict1[namesList[indx]] = scoresList[indx] |
| c) | dict1 = {}for indx in range(namesList): dict1[namesList[indx]] = scoresList[indx] |
| d) | dict1 = {}for indx in range(len(namesList)): dict1[namesList[indx]] = scoresList[indx] |

27) What is the output of the following program

class myClass:

 def \_\_init\_\_(self, v):

 self.value = v

 def method1(self,n):

 self. value = self. value\*n

 def method2(self,n):

 self. value= self. value+n

 def getValue(self):

 return self.value

x = myClass(7)

y = myClass(5)

z = myClass(10)

x.method1(10)

y.method2(x.getValue())

z.method2(y.getValue())

y = x

y.method1(3)

print(x.getValue(), z.getValue())

|  |  |
| --- | --- |
| a) | 210 85 |
| b) | 225 85 |
| c) | 210 80 |
| d) | 225 80 |

28) What will be the output of the following Python code fragment?

dict1 = {"ICS104": 3, "MATH102":3, "ICS108": 3, "ICS202": 3}

for indx in dict1:

 if "MATH" in indx:

 dict1[indx] = dict1[indx] + 1

print(dict1)

|  |  |
| --- | --- |
| a) | {'ICS104': 3, 'MATH102': 4, 'ICS108': 3, 'ICS202': 3} |
| b) | {'ICS104': 4, 'MATH102': 4, 'ICS108': 4, 'ICS202': 4} |
| c) | {'COE202': 5} |
| d) | {'ICS104': 1, 'MATH102': 1, 'ICS108': 1, 'ICS202': 1} |

29) Consider the following Python code fragment:

x = [2, 3, 5, 7]

y = x

z = list(y)

Given the following statements:

x and y are references to two independent lists.

z and y are references to the same list.

z and x are references to the same list.

A total of three lists are created by the above program.

Choose the correct answer:

|  |  |
| --- | --- |
| a) | All four statements are false. |
| b) | All four statements are true. |
| c) | Only statement 1 is True. |
| d) | Only statements 1 and 4 are True. |

30) What will be the output of the following program?

infile = open("input.txt","r")

I = 4

x = infile.read(i);

while x != "":

 print(x)

 i=i\*2

 x = infile.read(i);

infile.close()

**The content of the input.txt file is:**

193432238

55546645

|  |  |
| --- | --- |
| a) | 19343223855546645 |
| b) | 19343223855546645 |
| c) | 19343223855546645 |
| d) | Generates an error |

**Part 2 : C Language MCQs [ 10 x 1.5 = 15 points ]: (Make sure to bubble the correct answer in the green sheet)**

31) What is the output of the following program

#include <stdio.h>

int main() {

 int num1 = 5, num2 = 10;

 int \*p;

 p = &num1;

 \*p = \*p + 4;

 p = &num2;

 \*p = \*p + num1;

 printf("%d %d",num1 , \*p);

 return 0;

}

|  |  |
| --- | --- |
| a) | 5 15 |
| b) | 9 15 |
| c) | 9 19 |
| d) | 5 19 |

32) Which of the following is the correct output of the code?

#include <stdio.h>

int main(void)

{

 int k = 25 ;

 if (k > 1 && k < 10)

 printf("%d",(k - 10));

 else if (k > 10 && k < 25)

 printf("%d", k);

 else if (k > 10 || k <= -1)

 printf("%d",(k + 2));

 else

 printf("%d", 2 \* k);

}

|  |  |
| --- | --- |
|  | 27 |
|  | 25 |
|  | 50 |
|  | 15 |

33) Which of the following is true for a C program?

|  |  |
| --- | --- |
| a) | Any C program does not need to contain any function  |
| b) | Any C program must contain at least one function. |
| c) | Any C program needs input data. |
| d) | None of the above |

34) Which of the following is the correct output of the code?

#include <stdio.h>

int main(void)

{

 int x = 150;

 if(x >= 100 )

 if(x > 150)

 if(x <= 100)

 printf("Blue");

 else

 printf("Red");

 else if ( x < 150)

 printf("Magenta");

 else

 printf("Green");

}

|  |  |
| --- | --- |
|  | Red |
|  | Green |
|  | Magenta |
|  | Blue |

35) What is the output of the following C program?

#include <stdio.h>

int main() {

int p = 1, i = 2, j = 3;

double x = 8.5;

if(x > 5){

 p = p + 1;

 if(x < 10)

 i = i + 1;

 else

 j = j - 1;

}

else if (x > 0){

 p = p - 1;

 if(x<3)

 i = i - 1;

 else

 j = j + 1;

}

else

 p = p - 2;

printf("i=%d, j=%d, p=%d", i, j, p);

return 0;

}

|  |  |
| --- | --- |
|  | i=3, j=3, p=2 |
|  | i=3, j=3, p=1 |
|  | i=3, j=2, p=3 |
|  | i=2, j=3, p=3 |

36) What is the output shown after executing the following code fragment?

int n = 2036;

while(n % 10){

 printf("%d", n % 10);

 n= n / 10;

}

|  |  |
| --- | --- |
| a) | 63 |
| b) | 36 |
| c) | 630 |
| d) | 6302 |

37) What is the output of the following program

#include <stdio.h>

int main(void) {

 double x=5,y=4,z=8;

 double\* p1=&x;

 double\* p2=&y;

 double\* p3=&z;

 \*p1 = \*p1 + \*p2;

 p2 = p1;

 \*p3 = \*p2 + \*p1;

 (\*p2)++;

 printf("%.1f %.1f %.1f",x,y,z);

 return 0;

}

|  |  |
| --- | --- |
| a) | 9.0 9.0 18.0 |
| b) | 10.0 10.0 20.0 |
| c) | 10.0 4.0 18.0 |
| d) | 5.0 4.0 8.0 |

38) What will be printed after executing the following C code fragment?

int indx;

for(indx = 1; indx < 4 ;indx++)

 indx++ ;

printf("%d", indx);

|  |  |
| --- | --- |
| a) | 4 |
| b) | 3 |
| c) | 5 |
| d) | 2 |

39) What will be printed after executing the following C code fragment?

int indx = 5 ;

indx++ ;

printf("%d", indx++);

|  |  |
| --- | --- |
| a) | 4 |
| b) | 5 |
| c) | 6 |
| d) | 7 |

40) What will be printed after executing the following C code fragment?

 int indx1, indx2, counter = 0;

 for(indx1 = 0; indx1<3 ;indx1++)

 for(indx2 = 0; indx2<3 ;indx2++)

 counter=counter+1;

 printf("%d", counter);

|  |  |
| --- | --- |
| a) | 9 |
| b) | 4 |
| c) | 6 |
| d) | 16 |