King Fahd University of Petroleum and Minerals
College of Computer Science and Engingeering
Information and Computer Science Department

ICS 104: Introduction to programming in python and C
Spring Semester 2020-2021 (202)
Final Exam, 29 April 2021
Exam Duration: 120 Minutes

Important Notes About The Final Exam in Term 202:
1. The exam covers all material taken in the lectures, labs and assignments.

2. The final exam consists of two parts for a total of 100 points as follows:

Part 1 (75 points) : 30 multiple choice questions divided as follows: 22 questions on Python and 8 questions on C.

Part 2 (25 points) : One Python programming question that will be written on paper.

[75 points]: Choose the correct answer

1) The last value printed after executing the following Python code is:

```
for i in range(2,5):
    for j in range(5,7):
        print(i-j)
        j = j - i
```

a)	-2
b)	0
c)	-3
d)	-1
e)	This code generates error.

2) The output of the following Python code is:

```
email = "firstName.lastName@kfupm.edu.sa"
at = []
dot = []

for m in range(len(email)):
    if email[m] == '.':
        dot.append(m)

    if email[m] == '@':
        at.append(m)

print(email[dot[0]+1 : at[0]])
```

a)	firstName
b)	This code generates error.
c)	lastName
d)	.lastName
e)	<Blank Line>

3) The output of the following Python code is:

```
h = 9
m = 1
n = 4
f = 5
k = 2

x = h // n + m * f % 2 ** k

print(x)
```

a)	3.25
b)	1
c)	0
d)	2
e)	3

4) _____ is the equivalent of the following Python expression:

```
x = 67 - sqrt(sqrt(a**3/(9*h) + r**2)/32.0)
```

a)	$$x = 67 - \sqrt{\sqrt{\frac{a^3}{9}h + r^2}/32.0}$$
b)	$$x = 67 - \sqrt{\sqrt{\frac{a^3}{9h}} + r^2/32.0}$$
c)	$$x = 67 - \sqrt{\sqrt{\frac{a^3}{9h} + r^2}/32.0}$$
d)	Invalid expression
e)	$$x = 67 - \sqrt[4]{\sqrt{\frac{a^3}{9h}} + r^2/32.0}$$

5) What is the result of the following Python code fragment?

```
x=3
y=15

while x <= y:
x = x * 2

print(x)
```

a)	6
b)	12
c)	24
d)	This code generates error
e)	None of the given answers is correct

6) What is the result of the following Python code fragment?

```
x = 5
y = 9
flag = x < y
while flag and y > 0 :
    x = x - 1
    y = y - 2
print("x = %d and y = %d" % (x,y))
```

a)	x = 0 and y = -1
b)	x = 5 and y = 9
c)	x = 3 and y = 5
d)	x = 1 and y = 1
e)	x = 2 and y = 3

7) In Python, before invoking a method on an object, what must be done first?

a)	Initialize all instance variables
b)	Invoke the accessor and mutator methods
c)	Create a public interface
d)	Construct the object
e)	Declare variable using self prefix

8) Consider the following Python code segment:

```python
def add(self, amount) :
    self._balance = self._balance + amount
```

What is the name of the local variable in it:

a)	add
b)	_balance
c)	self
d)	self._balance
e)	amount

9) What is wrong with the following Python code fragment:

```python
file = open("courses.txt", "w")
line = file.readline()
course = line.split()
print(course)
file.close()
```

a)	The file has been opened for writing, not reading.
b)	The file name is invalid.
c)	The readline method has not been used correctly.
d)	The split method has not been used correctly.
e)	There is nothing wrong with the code

10) What will be in the list aList after executing the following Python code?

```python
aList=[]
for i in range(1,6):
    aList.insert(0,i)
```

a)	[1, 2, 3, 4, 5]
b)	[5, 4, 3, 2, 1]
c)	[1, 2, 3, 4, 5, 6]
d)	[6, 5, 4, 3, 2, 1]
e)	None of the given answers is correct

11) An input file contains a person's last name and age on the same line separated by a space. For example,
    Al-Salem 21
    Which Python statements extract this information correctly?

a)	`record = inputFile.readline()`
	`data = record.split()`
	`name = data[0].rstrip()`
	`age = int(data[1])`

b)	`record = inputFile.readline()`
	`data = record.split()`
	`age = int(data[0])`
	`name = data[1].rstrip()`

c)	`record = inputFile.read(1)`
	`data = record.split()`
	`name = data[0].rstrip()`
	`age = int(data[1])`

d)	`record = inputFile.readline()`
	`name = record[0].rstrip()`
	`age = int(record[1])`

e)	`record = inputFile.readline()`
	`data = record.split()`
	`name = data[1].split()`
	`age = int(data[1])`

12) How many elements will be in the `bList`, after executing the following Python code if the user enters the numbers 1, 3, 1, 4, 2 in the same order?

```
bList=[]
for i in range(5):
    num=int(input("Enter a positive integer"))
    if num in bList:
        bList.remove(num)
        bList.append(num+num)
    else:
        bList.append(num)
```

a)	5
b)	3
c)	4
d)	2
e)	1

13) Which of the following is the correct way to create an independent copy of the list `cList` in Python?

a)	`cListCopy = cList`
b)	`cListCopy.list(cList)`
c)	`cListCopy.list[cList]`
d)	`cListCopy = list[cList]`
e)	`cListCopy = list(cList)`

14) Given the list `list1=['S','M','T','W','T','S','F']`, what is the correct Python statement to delete the first `'S'` from the list `list1`?

a)	`list1.pop("S")`
b)	`list1.remove(0)`
c)	`list1.pop(1)`
d)	`list1.remove("S")`
e)	`list1.pop()`

15) What is the output of the following Python code?

```python
dictLetter = {66:'B' , 65:'A', 67:'C'}
dictLetter[66] = dictLetter[66]+'K'
dictLetter.pop(67)
dictLetter['D'] = 68

for i in dictLetter:
    print(i,dictLetter[i],end=' ')
```

a)	66 B 65 A 68 D
b)	66 BK 65 A 68 D
c)	66 BK 65 A D 68
d)	65 A 66 B 68 D
e)	It will generate a syntax error.

16) What will be the result of executing the following Python code?

```
myValues = {-5:7, 2:2, 3:-3, -4:-2}
sumVal = 0

for item in myValues.values():
    sumVal = sumVal + item

print(sumVal, myValues.get(sumVal, -1))
```

a)	-4 -2
b)	0 -1
c)	4 -1
d)	-4 -1
e)	It will generate a syntax error.

17) What is the result of running the following Python code?

```
def main ():
    x = 17
    y = 0
    v = 5
    try:
        v = x / y
    except ArithmeticError:
        v = 10
    except Execption:
        v = 15
    finally:
        print(y, v)
main()
```

a)	0 5
b)	0 10
c)	0 15
d)	Nothing is displayed
e)	None of the given answers is correct

18) What is the result of running the following Python code?

```python
def main():
    try:
        outf = open("out.txt", "w")
        raise ValueError("Error")
    except ArithmeticError:
        print("Error 1")
    except IOError:
        print("Error 2")
    except ValueError as xyz:
        print(xyz)
    finally:
        print("Error 4")
    print("Error 5")

main()
```

a)	Error 1 Error 4
b)	Error xyz Error 5
c)	Error xyz Error 4 Error 5
d)	Error Error 4 Error 5
e)	None of the given answers is correct

19) How many lines of output will be displayed by the following C program?

```c
#include <stdio.h>
int main() {
  int a,b;
  a = 0;
  b = 5;
  do {
    printf("%d\n", 2 * a + b);
    a = a + 1;
    b = b - 1;
  } while (b - a > 0);
}
```

a)	7
b)	3
c)	5
d)	2
e)	Infinite loop

20) The part of a C program where an identifier can be referenced is called the_____of the identifier.

a)	address
b)	name
c)	function
d)	value
e)	scope

21) Which statement below, when placed in the blank space, will make the following Python and C codes equivalent.

Python	**C**
`n = int(input("Enter an integer> "))`	`printf("Enter an integer> ");` _____`;`

a)	`scan(n)`
b)	`scanf(n)`
c)	`scan("%d", &n)`
d)	`scanf("%d", &n)`
e)	`scanf("%d", n)`

22) What will be the output of the following C program?
```c
#include <stdio.h>
int main() {
   int n;
   int *np;
   n = 2;
   np = &n;
   printf("%d\n", *np + n);
}
```

a)	2
b)	4
c)	8
d)	44
e)	It will generate a syntax error.

23) What is the output of the following Python code

```
for val in range(0, 4) :
    print("+", end = "")
    for num in range(0,  val) :
        print("0",  end = "")
```

a)	+0+00+000+0000
b)	+000+000+000+000
c)	++0+00+000
d)	++++000000
e)	+0+0+0+0+0

24) What is the output of the following Python code

```
val = 1
while val < 5 :
    sum = val
    for x in  range(0, val, 2) :
        sum = sum +  x
    val = val + 1
    print(sum , end  = ",  ")
```

a)	1, 2, 5, 6,
b)	1, 3, 6, 10,
c)	1, 2, 3, 4,
d)	1, 2, 3, 5,
e)	10,

25) What will be the output of the following C program:

```c
#include <stdio.h>
int main() {
  int x;
  x = 1.5 + 12 / 2 * 2 ;

  printf("%d",x);
}
```

a)	4.5
b)	5
c)	4
d)	14
e)	13

26) What will be the output of the following C program:

```c
#include <stdio.h>
int main() {
  double y;
  y = (int) ( (double) 7 / (int) 2.5 );

  printf("%f",y);
}
```

a)	2.000000
b)	2.333333
c)	2.800000
d)	3.500000
e)	3.000000

27) What will be the output of the following Python code?

```
x = 50
def func(x):
    print('x is', x)
    x = 2
    print('Changed local x to', x)

func(x)
print('x is now', x)
```

a)	x is 50 Changed local x to 2 x is now 50
b)	x is 50 Changed local x to 2 x is now 2
c)	x is 2 Changed local x to 2 x is now 50
d)	x is 2 Changed local x to 50 x is now 50
e)	None of the given answers is correct

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

```
def FuncB(b, p):
    y = b ** p
    return y

def FuncA(x):
    a = FuncB(x, 2)
    return a

n = 5
result = FuncA(n)
print(result)
```

a)	2
b)	5
c)	10
d)	25
e)	125

29) In C programming language, the prototype of a function that takes 2 integer values as input arguments and returns no value can be written as:

a)	`int fun1 (int a, int b) ;`
b)	`void fun1 (int a, int b) ;`
c)	`void fun1 (double a, double b) ;`
d)	`void fun1 (char a, char b) ;`
e)	None of the given answers is correct.

30) What will be the output of the following C code?

```c
#include <stdio.h>
int fun1(int x, int y){
   int z;
   y = 10;
   z = x * y;
   return (z);
}

int main() {
   int x,y;
   x=2;
   y=4;
   printf("%d times %d is %d",x,y,fun1(x,y));
   return 0;
}
```

a)	4 times 2 is 8
b)	2 times 4 is 8
c)	2 times 4 is 20
d)	4 times 2 is 20
e)	Nothing will be displayed as an output

[25 points] Programming Question

Write a python program that does the following:
1. Read the number of strings, n, from the user. Assume that the user enters a positive integer.
2. Asks the user to enter n strings and save them into a list.
3. Display the list of strings.
4. Use loops to determine and display the total number of vowels in all strings.

Note that the set of vowels in English consists of $\{a, A, e, E, i, I, o, O, u, U\}$.

Please make sure that your indentation is clear, otherwise you may lose points.

Below is a sample output that gives an idea of how your program should work:

```
Enter the number of strings: 3
Enter string: Table
Enter string: Chair
Enter string: Eagle
The input list is ['Table', 'Chair', 'Eagle']
The total number of vowels =  7
```