Tutorial Letter 201/1/2017

Visual Programming 1
INF1511

Semester 1

School of Computing

IMPORTANT INFORMATION:

This tutorial letter contains **ASSIGNMENT SOLUTIONS** for Semester 1 of 2017.

All other important information is sent to your **myLife** account and is available on the module **INF1511** website.

Define tomorrow.

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Assignment 1 MCQ [20]

Due date	27 February 2017
Study material	Prescribed textbook: Chapters 1 & 2
Submission procedure	Mark-reading sheet on myUnisa
Number of questions	20
Unique assignment number	656008

Question	Option	Answer
1. Python is a/an ….. language	1	`compiled`
	2	`interpreted`
	3	`assembly`
	4	`None of the above`
2. Comments in Python begin with a …..	1	`*`
	2	`//`
	3	`#`
	4	`None of the above`
3. Which is the proper assignment for a string variable?	1	`Word = "hello"`
	2	`Word = 'hello'`
	3	`Word = hello`
	4	`All of the above`
	5	`Both 1 and 2`
4. The format code for an integer variable is …..	1	`%f`
	2	`%e`
	3	`%d`
	4	`%c`
	5	`%x`
5. The function used to print messages and the results of computations to the console is …..	1	`printf()`
	2	`print()`
	3	`printline()`
	4	`println()`

6. Consider the following statement:
 	
`x=2.5`
 	
`print("The value of x is %d" %x)`
 	
The output is:
	1	`Python will throw an error, as x is a float variable and %d is the format code for integer`

	2	`The value of x is 2.5`
	3	`The value of x is 2`
	4	`The value of x is %d %x`

7. What is the output of the following statements?
 	
`print("Hello", end= ' ')`
`print("Peter")`
	1	`Hello`
		`Peter`

	2	`Hello Peter`
	3	`Hello = Peter`
	4	`Hello end Peter`
8. What is the output of the following statement? `print("Hello","How are you?")`	1	`Hello,How are you?`
	2	`Hello How are you?`
	3	`HelloHow are you?`
	4	`None of the above`
9. What is the output of the following statement? `print("Good" + "Morning")`	1	`GoodMorning`
	2	`Good Morning`
	3	`Good` `Morning`
	4	`None of the above`
10. The correct statement to print the value of variable `y=100` is …..	1	`print(y)`
	2	`print("The value of y is",y)`
	3	`print('The value of y: %d' %y)`
	4	`All of the above`

11. Which is the correct output for the following print statement:
 	
`print('Hi, \`
`How are you?')`
	1	`HiHow are you?`

	2	`Hi, How are you?`
	3	`Hi How are you?`
	4	`Hi` `How are you?`

12. The output of the following statement is:
 	
`print('''Today`
`is a`
`public holiday.''')`
	1	`Syntax error`

	2	`Today`
		`is a`
		`public holiday.`

	3	`Today is a public holiday.`
	4	`Today is a` `public holiday`

13. The output of the following code is:
`i=1;`
`while i < 10:`
`    i = i + 3`
`    print (i, end=' ')`
	1	`10`

	2	`4 7`
	3	`1 4 7`
	4	`1 4 7 10`
	5	`4 7 10`
14. The output of `print(3.5//2)` is …..	1	`1.0`
	2	`1.75`
	3	`3.5//2`
	4	`None of the above`
15. `x=5%2`. The value of `x` is …..	1	`2`
	2	`1`
	3	`2.5`
	4	`None of the above`
16. Which of the operations will give a value 9 to `x`?	1	`x = pow(3,2)`
	2	`x = 3**2`
	3	`x = pow(2,3)`
	4	`All of the above`
	5	`Only 1 and 2`
17. The function which returns the data type of an object is …..	1	`datatype()`
	2	`data()`
	3	`object()`
	4	`type()`

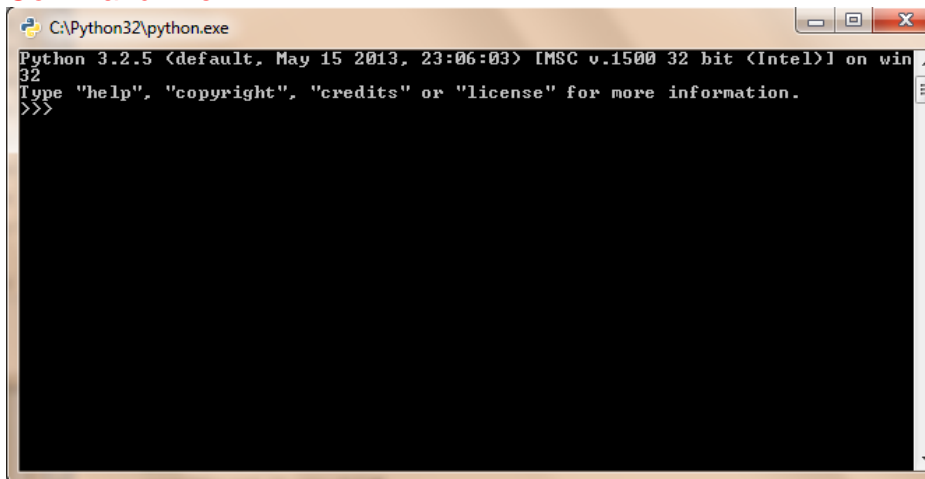| 18. Escape sequences in Python begin with a ….. character | 1 | # |
	2	//
	3	\
	4	None of the above
19. print("10/5") will output:	1	10/5
	2	2
	3	0
	4	None of the above
20. print("Mac said: \"I like programming\"") will output:	1	Mac said: I like programming
	2	"Mac said: I like programming"
	3	Mac said: "I like programming"
	4	None of the above

Assignment 2 PDF [15]

Due date	6 March 2017
Study material	Prescribed textbook: Chapters 1 & 2
Submission procedure	Electronic submission via myUnisa
Number of questions	4
Unique assignment number	831612

1. Install Python and present screenshots of the program running in:
   i)   Command-line mode and (1)
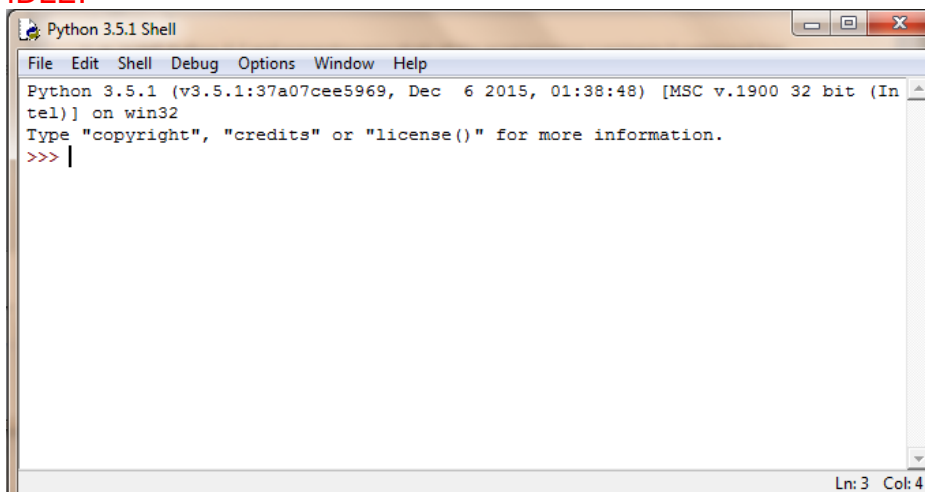   ii)   IDLE (1)   (2)

Command-line:

IDLE:

2. Create a Python program that asks the input of students' marks from the user and displays the message '`Sorry, you don't qualify for a distinction`' for marks below

75 and '**Well done, you have received a distinction!**' for marks higher than 75. Provide the code that you used. (4)

```python
# ifelse.py
m= int(input("Enter marks: "))
if(m<75):
    print("Sorry, you don't qualify for a distinction")
else:
    print("Well done, you have received a distinction!")
```

3. Write a program in Python that computes the area of a triangle by accepting the base and height from the user. Provide the code that you used. (3)

The formula is **Base x Height ÷ 2**

```python
# Question3.py
b = int(input("Input the base: "))
h = int(input("Input the height: "))

area= b*h/2

print("area= ", area)
```

4. Write a program that generates a random number between 5 and 10(both included) and then print a pattern as shown below. If the random number generated is 5, the output will be: (6)

```
5 4 3 2 1

4 3 2 1

3 2 1

2 1

1
```

A sample run:

```
The random number generated is 6

6 5 4 3 2 1

5 4 3 2 1

4 3 2 1

3 2 1

2 1

1
```

```
#pattern
#create a random number between 5 and 10

from random import choice
r = choice(range(5,11))
print("The random number generated is",r)
for i in range(r,0,-1):
    j = 1
    k = i
    while(j <= k):
        print(i, end = ' ')
        i -= 1
        j += 1;
 print()
```

Assignment 3 MCQ [20]

Due date	13 March 2017
Study material	Prescribed textbook: Chapters 3 & 4
Submission procedure	Mark-reading on myUnisa
Number of questions	20
Unique assignment number	643422

Question	Option	Answer
1. An example of an immutable sequence in Python is ..…	1	`lists`
	2	**`strings`**
	3	`integers`
	4	`None of the above`
2. `a=('tiger', 'lion', 'fox')`. Here, `a` is an example of a ..… variable	1	`string`
	2	**`tuple`**
	3	`list`
	4	`None of the above`
3. `b=[2,6,8]`. Here, `b` is an example of a ..… variable	1	`string`
	2	`tuple`
	3	**`list`**
	4	`None of the above`
4. …… is an example of a mutable sequence in Python	1	`String`
	2	`Tuple`
	3	**`List`**
	4	`Boolean`
	5	`None of the above`
5. The index value of the first element in a sequence is ..…	1	`user defined`
	2	**`always zero`**
	3	`always one`
	4	`None of the above`
6. The output of: `word="hurry"` `print(word[4])` is:	1	`hurr`
	2	`hurry`
	3	`IndexError: string index out of range`
	4	**`y`**

7. What is the output of:
 	
`lst = ['Africa']`
`print(len(lst))`
	1	`6`

	2	`5`
	3	**1**
	4	`None of the above`

8. What is the output?
 	
`name = "MoNiCa"`
`name = name.upper()`
`name = name.swapcase()`
`print(name)`
	1	`MONICA`

	2	`mOnIcA`
	3	**monica**
	4	`None of the above`
9. Which is a true statement?	1	`A sequence is an unordered group of elements`
	2	**The length of a sequence will be greater than the position number of its last element**
	3	`All elements in a tuple must be of the same type`
	4	`None of the above`
10. The value of `x` in `x = 5 in [3, 'yes', 'no', 5]` is …..	1	`3`
	2	`4`
	3	**true**
	4	`None of the above`
11. Which is a true statement?	1	`Tuple is a mutable sequence`
	2	**Indexing of sequences begins at zero**
	3	`List is an immutable sequence`
	4	`All of the above`
12. Which of the options will output the string `I don't know`?	1	`print('I don\'t know')`
	2	`print("I don\'t know")`
	3	`print("I don't know")`
	4	**All of the above**
	5	`Only 1 and 2`

13. The statement `print(len("Good" + "Night"))` will output …..	1	9
	2	10
	3	Good Night
	4	GoodNight
	5	None of the above

14. What is the output of the following code: `fruit=('apple', 'mango','banana','orange')` `print(fruit[len(fruit)])`	1	orange
	2	apple
	3	banana
	4	mango
	5	None of the above

15. Which of the options will print all the elements in the tuple `fruit=('apple', 'mango','banana','orange')` one by one?	1	`for item in fruit:` `    print(fruit)`
	2	`for item in fruit:` `    print(item)`
	3	`for fruit in item:` `    print(item)`
	4	`for fruit in item:` `    print(fruit)`
	5	None of the above

16. What is the output of the following code? `word = "Night"` `word[0]="S"` `print(word)`	1	Sight
	2	Night
	3	S
	4	SNight
	5	None of the above

17. What is the output of the following code? `word = ("Night")` `word[0]="Sight"` `print(word)`	1	('Night')
	2	('Sight')
	3	('SightNight')
	4	None of the above

18. What is the output of the following code? `word = ["Night"]` `word[0]="Sight"` `print(word)`	1	['Night']
	2	['Sight']
	3	['SightNight']
	4	None of the above

19. The output of `print("abc" * 3)` is ..…	1	`abc*3`
	2	`invalid operation`
	3	`abcabcabc`
	4	`None of the above`
20. The output of `print("-".join("Africa"))` is ..…	1	`-A-f-r-i-c-a-`
	2	`A-f-r-i-c-a`
	3	`-Africa`
	4	`None of the above`

Assignment 4 PDF [15]

Due date	20 March 2017
Study material	Prescribed textbook: Chapters 3 & 4
Submission procedure	Electronic submission via myUnisa
Number of questions	5
Unique assignment number	711317

1. Write a program that accepts two strings from the user and prints the combination and the concatenation thereof. Provide the code that you used. (4)

   A sample run:

   ```
   Enter a string: Good
   Enter another string: day
   The combination is  dGoodaGoody
   The concatenation is  Goodday
   ```

   p.53
   ```
   # stringjoin.py
   p= input("Enter a string: ")
   q= input("Enter another string: ")
   print ("The combination is ", p.join(q))
   print ("The concatenation is ", p+q)
   ```

2. Create a program that stores the days of the week in a list and prompts the user to enter a numerical value for the day of the week and then displays the day in text form. Provide the code that you used. (4)
   Example:

1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday
7	Sunday

   p.65
   ```
   # listdays.py
   ```

```
days= ['Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday',
'Saturday', 'Sunday']
n= int(input("Enter a value between 1 and 7: "))
if 1 <= n <= 7:
        print ("The day is", days[n-1])
else:
    print ("Value is out of the range")
```

3. Write a recursive function to compute the sum of numbers from 1 to n. Provide the code that you used. (3)

```
# recursion.py

def oneToN(n):
  if n == 1:
    return 1
  else:
    return n + oneToN(n-1)
```

4. The following code shows a normal function definition. Rewrite the function as a Lambda function: (2)

```
def func(x):
    return x ** 4
print(func(7))

g= lambda x: x ** 4
print(g(7))
```

5. Through the use of modules, write a program that gives you this year's calendar and the current date and time as output. Provide the code that you used. (2)

```
# caltime

import calendar
import time
calendar.prcal(2016)
print(time.ctime())
```

Assignment 5 MCQ [20]

Due date	27 March 2017
Study material	Prescribed textbook: Chapters 5 & 6
Submission procedure	Mark-reading sheet on myUnisa
Number of questions	20
Unique assignment number	682421

Question	Option	Answer
1. The ..… statement in Python creates a `class` object.	1	`class`
	2	`def`
	3	`init`
	4	`None of the above`
2. Which is a true statement?	1	A class in Python should always define the __init__ method
	2	The __init__ method is executed before the creation of an instance.
	3	The __init__ method can have zero or more arguments
	4	`None of the above`
3. A/an ..… variable is shared by all instances of a class	1	`object`
	2	`data`
	3	`class`
	4	`instance`
4. Which is a valid built-in class attribute in Python?	1	`__bases__`
	2	`__doc__`
	3	`__name__`
	4	`All of the above`
	5	`Only 1 and 2`

5. The ..... method produces the string representation of a class instance	1	`__init__`
	2	`__str__`
	3	`__doc__`
	4	None of the above

6. Which of the given code segments will print the area of an object `r1` of class `Rect` as `12` correctly?	1	<pre>class Shape:
		    def __init__(self, x,y):
		        self.__l=x
		        self.__b=y
		    def area(self):
		        return self.__l *
		self.__b
		class Rect(Shape):
		    def __init__(self,x,y):
		        Shape.__init__(self,x,y)
		r1=Rect(3,4)
		print("Area:", r1.area())</pre>

	2	<pre>class Shape:
		    def __init__(self, x,y):
		        self.__l=x
		        self.__b=y
		    def area(self):
		        return self.__l *
		self.__b
		class Rect(Shape):
		    def __init__(self,x,y):
		        Shape.__init__(self,x,y)
		r1=Rect(3,4)
		print("Area:", r1._Shape__l *
		r1._Shape__b)</pre>

	3	Both 1 and 2
	4	None of these

7. Which of the given code segments will print the area of an object `s` of class `Square` as `144` correctly?	1	<pre>class Square:
		    def __init__(self, a):
		        self.__a=a
		s=Square(12)
		print(s.__a * s__a)</pre>

	2	<pre>class Square:
		    def __init__(self, a):
		        self.__a=a
		s=Square(12)
		print(s._Square__a *
		s._Square__a)</pre>

| | 3 | ```
class Square:
    def __init__(self, a):
        self.__a=a
s=Square(12)
print(s.Square__a * s.Square__a)
``` |
|---|---|---|
| | 4 | None of these |
| 8. The code given demonstrates a simple class `Rect` and its instance `a`. Which code snippet will output the area as `15` correctly? | 1 | ```
class Rect:
    def __init__(self,l,b):
        self.l=l
        self.b=b
    def area():
        return self.l * self.b
a=Rect(5,3)
print(a.area())
``` |
| | 2 | ```
class Rect:
    def __init__(self,l,b):
        self.l=l
        self.b=b
    def area(self):
        return l * b
a=Rect(5,3)
print(a.area())
``` |
| | 3 | ```
class Rect:
    def __init__(l,b):
        self.l=l
        self.b=b
    def area(self):
        return self.l * self.b
a=Rect(5,3)
print(a.area())
``` |
| | ==4== | ==None of the above== |
| 9. What is the output? <br><br> ```
class Car(object):
  make="Toyota"
  def __init__(self,
  m="Honda"):
    self.make=m
c=Car("Ford")
print(c.make)
``` | 1 | Toyota |
	2	Honda
	==3==	==Ford==
	4	None of the above

10. What is the output?
 	
``
class Car(object):
  make="Toyota"
  def __init__(self,
   m="Honda"):
    self.make=m
c=Car("Ford")
print(Car.make)
``
	1	**Toyota**

	2	Honda
	3	Ford
	4	None of the above

11. What is the output?
 	
``
class Car(object):
  make="Toyota"
  def __init__(self,
   m="Honda"):
    make=m
c=Car()
print(c.make)
``
	1	**Toyota**

	2	Honda
	3	ToyotaHonda
	4	None of the above

12. What is the output?
 	
``
class Pet:
  def __init__(self,
   n="Spud"):
    _name=n
p=Pet("Bella")
print(p._name)
``
	1	Spud

	2	Bella
	3	self
	4	**None of the above**

13. What is the output?
 	
``
class Pet:
  def __init__(n="Spud"):
    self._name=n
p=Pet("Bella")
print(p._name)
``
	1	Spud

	2	Bella
	3	self
	4	**None of the above**

14. What is the output?
 	
``
class Pet:
  def
   __init__(self,n="Spud"):
    self._name=n
p=Pet("Bella")
print(p._name)
``
	1	Spud

	2	**Bella**
	3	self
	4	None of the above
15. When one class is derived from another single class it is called …..	1	Simple inheritance
	2	**Single inheritance**
	3	Multi-level inheritance
	4	Multiple inheritance
	5	None of these

16. What does the following class definition represent?
 	
``python
class Rect(Shape):
  def __init__(self,x,y):
    Shape.__init__(self,x,y)
``
	1	A single inheritance where class Shape inherits class Rect.

	2	A single inheritance where class x inherits class y.
	3	There is no inheritance.
	4	A single inheritance where class Rect inherits class Shape.

17. In the following class definition, what is `total`?
 	
``python
class Travel(object):
  """Bon voyage"""
  total = 0
  def display(self):
print("Total number of bookings:", Travel.total)
``
	1	An instance attribute

	2	A class attribute
	3	An instance method
	4	A class method
18. Which is not a type of inheritance?	1	Double
	2	Single
	3	Multiple
	4	Multilevel

19. In the following class definition, what is method `display`?
 	
``python
class Travel(object):
  """Bon voyage"""
  total = 0
  def display(self):
    print("Total number of bookings:", Travel.total)
``
	1	An instance attribute

	2	A class attribute
	3	An instance method
	4	A class method

20. What is the output of the following code?
 	
``python
class Shape:
    def __init__(self, x=3,y=4):
        self.x=x
        self.y=y
s1=Shape(5,6)
s2=Shape()
s1=s2
print(s1.x,s1.y)
``
	1	5 6

	2	0 0
	3	3 4
	4	None of the above

Assignment 6 PDF [20]

Due date	3 April 2017
Study material	Prescribed textbook: Chapters 5 & 6
Submission procedure	Electronic submission via myUnisa
Number of questions	4
Unique assignment number	597044

1. Write a Python class that contains two methods: (5)
   a. get_String: accepts a string from the user (The program should prompt the user to provide a word) and
   b. print_String: prints the string in <u>upper case</u>

```python
class IOString():
    def __init__(self):
        self.str1 = " "

    def get_String(self):
        self.str1= input("Type a word: ")

    def print_String(self):
        print(self.str1.upper())

str1 = IOString()
str1.get_String()
str1.print_String()
```

2. Give the definition of multiple inheritance and explain for what purpose it is used. (4)

   Multiple inheritance is when a class is derived from more than one base class. It is used when using the members of two or more classes, that have no connection, via another class. You combine the features of all those classes by inheriting them.

3. We have a class defined for cats. Create a new cat called cat1. Set cat1 to be a grey Burmese cat worth R3000 with the name Whiskers. (5)

```python
# define the Cat class
class Cat:
    name = ""
    kind = "cat"
    color = ""
```

```
        value = 100.00
    def description(self):
        desc_str = "%s is a %s %s cat worth R%.2f." % (self.name,
self.color, self.kind, self.value)
        return desc_str

# your code goes here
cat1 = Cat()
cat1.name = "Whiskers"
cat1.color = "grey"
cat1.kind = "Burmese"
cat1.value = 3000.00

# test code
print(cat1.description())
```

4. You are given a text file with full names of people and their gender.

Store the details in a text file and name it `names.txt`. (You can copy and paste the contents below into a text editor like Notepad. Ensure that there is a single space between firstname and lastname and there should be a space on either side of the hyphen).

Write a program that reads the above file and displays the names of all females. Also display the count of males and females. (6)

The file looks as follows:

Ashley Morrison - M
Frederick Thompson - M
Affection Molafe - F
Keiran George - M
Isaac Milan - M
Jennifer Low - F
Kerry Milan - F
Marie Livingston - F
Lorna Ben - F
Laura McMillan - F
Hugo Strydon - M
Detlev King - M

A sample run:

```
Affection Molafe
Jennifer Low
Kerry Milan
Marie Livingston
Lorna Ben
Laura McMillan

No. of females: 6
No. of males: 6
```

```python
#names list - display female names, count each gender
countF = 0
countM = 0

#for line in open("names.txt"):
#open file for reading

f = open("names.txt", 'r')
for line in f:
    line = line.strip() #without this count is wrong
    parts = line.split(" - ")
    name, gender = parts
    if gender == "F":
        print(name)
        countF += 1
    else:
        countM += 1
f.close()
print()
print("No. of females:", countF)
print("No. of males:", countM)
```

Assignment 7 PDF [15]

Due date	10 April 2017
Study material	Prescribed textbook: Chapters 7
Submission procedure	Electronic submission via myUnisa
Number of questions	5
Unique assignment number	899314

Create a basic program using PyQt that converts kilograms to pounds and vice versa:

1 kilogram = 2.2 pounds

1. Provide a screenshot of your program (2)
   The screenshot should show a similar program with similar features

2. Your program should include the following features:
   i. Three labels
   ii. Two line edit boxes
   iii. Two push buttons (3)
      One mark per feature type

3. Add a picture to your program (it should relate to the program's functionality). (2)

4. Replace the name "John Doe" in the label at the top of your program to show your own name and surname   (2)

5. Provide the code of the two buttons in your program.   (6)

The kilogram to pound button:
```
def btn_KtoP_clicked(self):
        kilo = float(self.edt_Kilo.text())
        pound = (kilo * 2.2)
        self.edt_Pounds.setText(str(pound))
```

The pound to kilogram button:
```
def btn_PtoK_clicked(self):
        pound = float(self.edt_Pounds.text())
        kilo = (pound/2.2)
        self.edt_Kilo.setText(str(kilo))
```

Assignment 8 PDF [15]

Due date	18 April 2017
Study material	Prescribed textbook: Chapters 8
Submission procedure	Electronic submission via myUnisa
Number of questions	2
Unique assignment number	716216

Create a program in PyQt that is aimed towards benefiting a local community Library. The program should be able to add, edit and delete book entries to and from the inventory list.
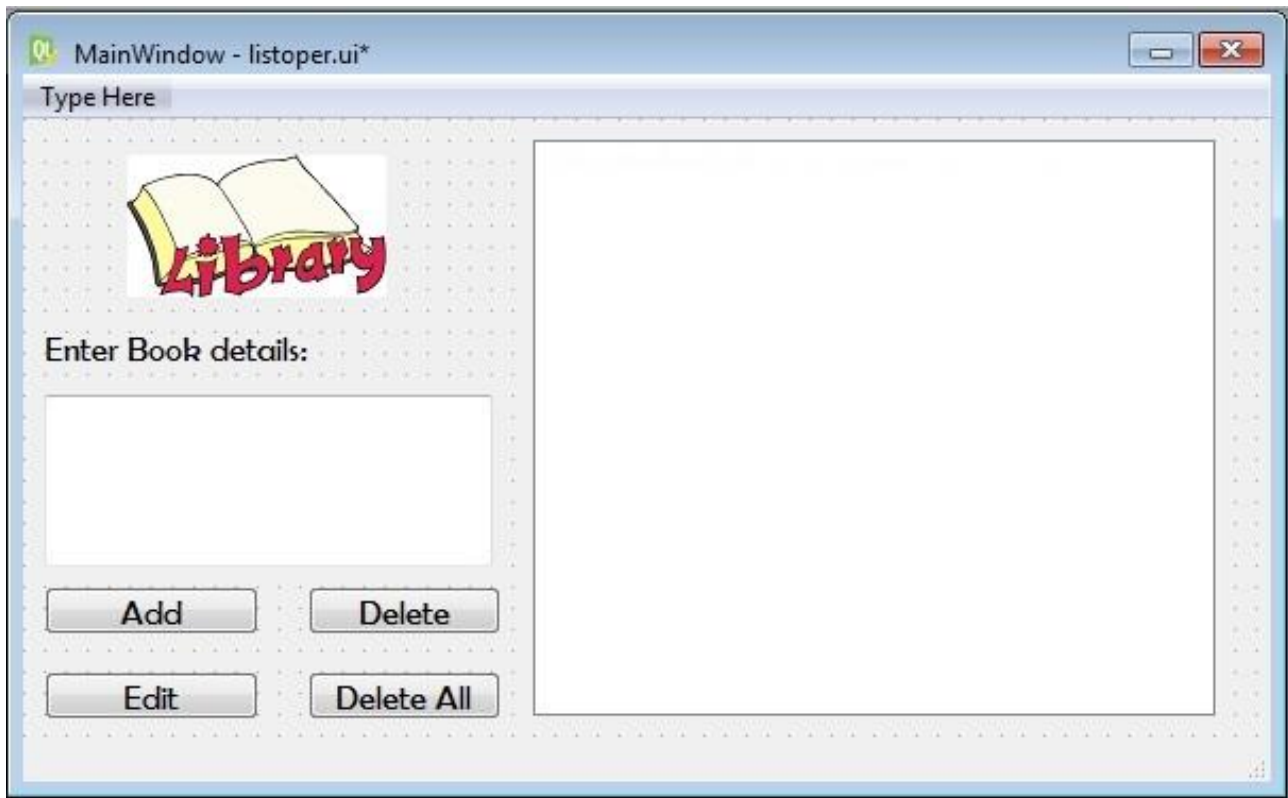
1. Provide a screenshot of your program in runtime, which shows at least two entries that you added to the list. Your screenshot should include the following features: (6)
   i.   Two list entries (2)
   ii. One list widget (1)
   iii. One line edit box (1)
   iv. One label (1)
   v.   Four push buttons (1)
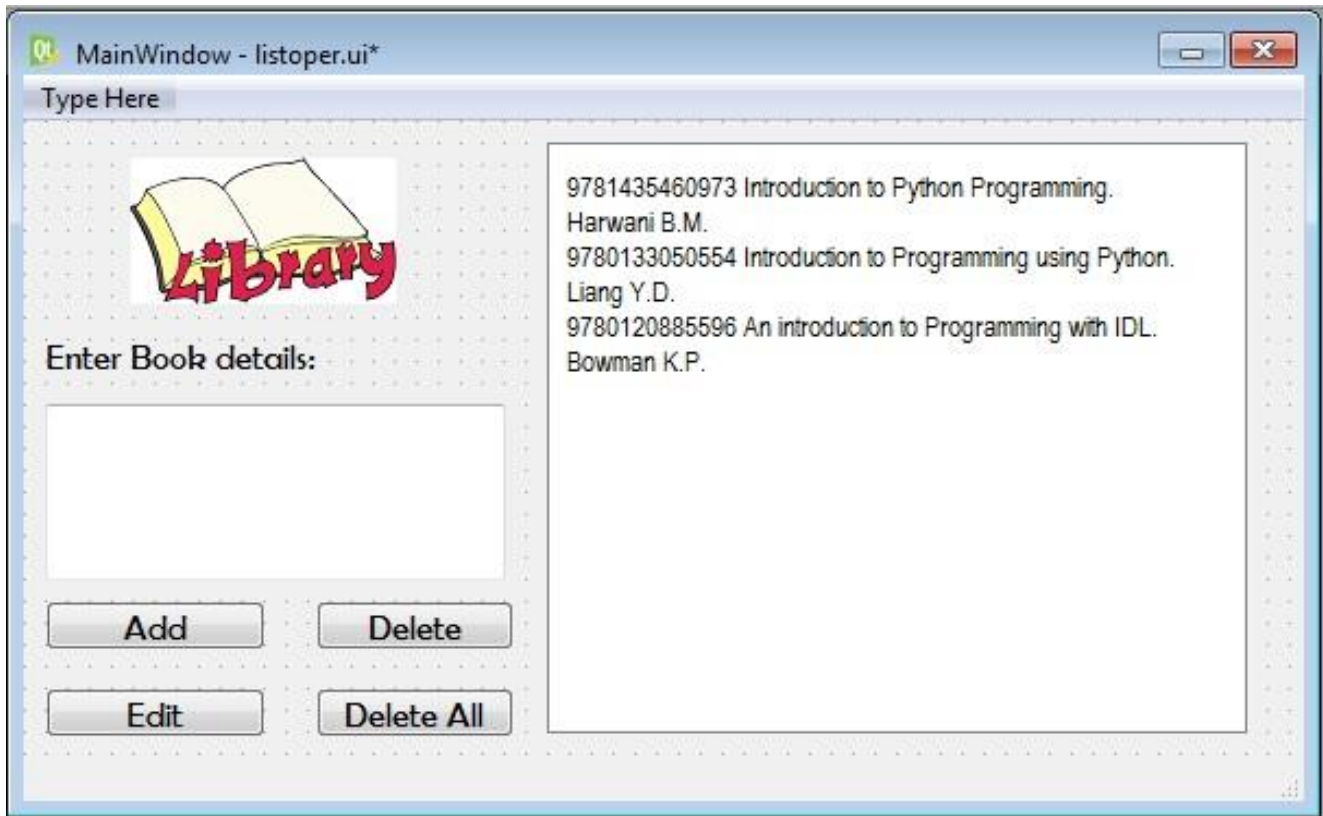
2. Provide the code that you used to call the list operations. (9)

   i. Add to list (3)

```
def addlist(self):
    self.ui.listWidget.addItem(self.ui.lineEdit.text())
    self.ui.lineEdit.setText('')
    self.ui.lineEdit.setFocus()
```

   ii. Edit list (4)

```
def editlist(self):
    row=self.ui.listWidget.currentRow()
    newtext, ok=QInputDialog.getText(self, "Enter new text",
  "Enter new text")
    if ok and (len(newtext) !=0):
        self.ui.listWidget.takeItem(self.ui.listWidget.currentRow())
        self.ui.listWidget.insertItem(row,QListWidgetItem(newtext))
```

iii.   Delete item (1)

```python
def delitem(self):
    self.ui.listWidget.takeItem(self.ui.listWidget.currentRow())
```

iv.   Delete all items (1)

```python
def delallitems(self):
    self.ui.listWidget.clear()
```