**CIS 3260 – Introduction to Programming**

**Individual Assignment 8**

**Submission:**

* Add your full name and email address as comments on top of each python program. Add appropriate comments at other locations of your python programs for readability.
* Name your python program as IA8Q#.py. For example, for question #1, your program should have a name IA8Q1.py
* For each question, put corresponding answers in a word document. Name your word document as **IA8.doc**
* Submit following items into iCollege -> Assessment -> Assignment 7
  + IA8.doc
  + IA8Q1.py
  + IA8Q2.py
  + IA8Q3.py

[Some Comments from your instructor]:

I highly recommend you use PyCharm to write following two programs. You can open existing python project and create two new python files IA8Q1.py, IA8Q2.py and IA8Q3.py.

**1. [ Objectives: 7.1,7.2,7.3,7.4,7.7]**

1) [33 points] Assume you are given a task to analyze a list of ratings (integers, ranging from 1 to 5). The ratings are stored in a list as below. Please develop a program to ask user to enter a rating and then count the number of given ratings from the list.

ratings\_list=[4,5,1,2,3,5,4,2,3,1,5,4,4,3]

|  |
| --- |
| **Sample Run 1**  Please enter a rating: 5  3 ratings from our data set are with value 5 |

|  |
| --- |
| **Sample Run 2**  Please enter a rating: 0  0 is not a valid rating |

A. [5 points] System Analysis: What is(are) the input(s) and output(s)?

B. [5 points] System Design: List the steps to get output(s) from input(s) in English.[Hint: you can refer to the example in exercise 7.3]

C. [4 points] We have learned to two ways to traverse elements from list. Way 1 is for “read only” task ( i.e., no **range** used in for loop header) ; way 2 is for “read and update” task ( i.e., must use **range** in for loop header)). Which way you are going to use in this problem? And why you prefer to choose this way?

D. [5 points] Write your program and put your source code here.

E. [2 points] A screenshot of the output of program

2) Share with us TWO errors you experienced when writing this program. [ It is common to experience errors. I will be surprised if you do not see any errors. In case this happens, you can make some errors by yourself.]

**I . Error 1**

A. [2 pts] Explain what is the type of the error (syntax, run-time, or logical error)?

B. [2 pts] How you resolve it?

C. [2 pts] How much time you spent to resolve it?

**II. Error 2**

A. [2 pts] Explain what is the type of the error (syntax, run-time, or logical error)?

B. [2 pts] How you resolve it?

C. [2 pts] How much time you spent to resolve it?

**2. [ Objectives: 7.1,7.2,7.3,7.4,7.6,7.7]**

1) [33 points] Let us continue question1. But this time you are asked to write a program to count the frequency of each rating (1,2,3,4,5). Please use a list counts\_list to store the counts. For example, count[0] stores the count of rating 0, count[1] stores the count of rating 1.

ratings\_list=[4,5,1,2,3,5,4,2,3,1,5,4,4,3]

|  |
| --- |
| **Sample Run**  Rating 1: 2  Rating 2: 2  Rating 3: 3  Rating 4: 4  Rating 5: 3 |

A. [5 points] System Analysis: What is(are) the input(s) and output(s)

B. [4 points] What should be the length of list counts\_List? How to create the list counts\_List in Python?

C. [5 points] System Design: List the steps to get output(s) from input(s) in English.

D. [5 points] Write your program and put your source code here.

E. [2 points] A screenshot of the output of program.

2) Share with us TWO errors you experienced when writing this program.

**I . Error 1**

A. [2 pts] Explain what is the type of the error (syntax, run-time, or logical error)?

B. [2 pts] How you resolve it?

C. [2 pts] How much time you spent to resolve it？

**II. Error 2**

A. [2 pts] Explain what is the type of the error (syntax, run-time, or logical error)?

B. [2 pts] How you resolve it?

C. [2 pts] How much time you spent to resolve it?

**3. [ Objectives: 7.1,7.2,7.3,7.4,7.6,7.7]**

1)[34 points] It is still based on question 1. Assume you are given another list storing the name of users submitting the reviews. For example, “john” provided a review score 4; “alex” submitted a review score 1. Write a program to traverse the two lists and display the names of person(s) who gives the highest rating, and the person(s) who gives the lowest rating

ratings\_list=[4,5,1,2,3,5,4,2,3,1,5,4,4,3]

names\_list=[“john”, “alex”, “anna”, “max”, “allen”, “bria”, “david”, “jane”, “cathy”,“jecissa”, “grace”, “nick”, “paul”, “hans”,]

|  |
| --- |
| **Sample Run**  Highest rating is 5, given by alex,bria,grace  Lowest rating is 1, given by anna and jecissa |

A. [5 points] System Analysis: What is(are) the input(s) and output(s)?

B. [5 points] System Design: List the steps to get output(s) from input(s) in English.

C. [4 points] We have learned to two ways to traverse elements from list. Way 1 is for “read only” task ( i.e., no **range** used in for loop header) ; way 2 is for “read and update” task ( i.e., must use **range** in for loop header)). Which way you are going to use in this problem? And why you prefer to choose this way?

D. [5 points] Write your program and put your source code here.

E. [3 points] A screenshot of the output of program

2) Share with us TWO errors you experienced when writing this program. [ It is common to experience errors. I will be surprised if you do not see any errors. In case this happens, you can make some errors by yourself.]

**I . Error 1**

A. [2 pts] Explain what is the type of the error (syntax, run-time, or logical error)?

B. [2 pts] How you resolve it?

C. [2 pts] How much time you spent to resolve it?

**II. Error 2**

A. [2 pts] Explain what is the type of the error (syntax, run-time, or logical error)?

B. [2 pts] How you resolve it?

C. [2 pts] How much time you spent to resolve it?

***Objectives:***

**Week 4**

--- Chapter 3 ---

3.1 To write Boolean expressions using relational operators (§3.2).

3.2 To program with Boolean expressions (§3.3).

3.3 To implement selection control using one-way if statements (§3.4).

3.4 To implement selection control using two-way if-else statements (§3.5).

3.5 To implement selection control with nested if and multi-way if-elif-else statements (§3.6).

3.6 To combine conditions using logical operators (and, or, and not) (§3.10).

3.7 To use selection statements with combined conditions (§§3.11–3.12).

**Week 7**

--- Chapter 4 ---

4.1 To solve mathematics problems by using the functions in the math module (§4.2)

4.2 To represent and process strings and characters (§[4.3](about://ch04_pg0004.xhtml#P7001015381000000000000000001655)).

4.3 To encode characters using ASCII and Unicode (§[4.3.1](about://ch04_pg0005.xhtml#P7001015381000000000000000001674)).

4.4 To use the ord function to obtain a numerical code for a character and the chr function to convert a numerical code to a character (§[4.3.2](about://ch04_pg0006.xhtml#P70010153810000000000000000016C2)).

4.5 To represent special characters using the escape sequence (§[4.3.3](about://ch04_pg0007.xhtml#P70010153810000000000000000016E4)).

4.6 To test substrings using the in and not in operators (§[4.3.8](about://ch04_pg0012.xhtml#P70010153810000000000000000017AC)).

4.7 To compare strings (§[4.3.9](about://ch04_pg0013.xhtml#P70010153810000000000000000017BD)).

4.8 To use string functions min, max, and len (§[4.3.10](about://ch04_pg0014.xhtml#P70010153810000000000000000017F4)).

**Week 8**

--- Chapter 4 ---

4.9 To obtain a character in a string using the index operator [] (§[4.3.11](about://ch04_pg0015.xhtml#P7001015381000000000000000001812)).

4.10 To obtain a substring in a string using the slicing operator [start : end] (§[4.3.12](about://ch04_pg0016.xhtml#P700101538100000000000000000183A)).

4.11 Use repetition operator \* to duplicate strings (§[4.3.6](about://ch04_pg0016.xhtml#P700101538100000000000000000183A)).

4.12 To introduce objects and methods (§[4.5](about://ch04_pg0018.xhtml#P7001015381000000000000000001897)).

4.13 To introduce the methods in the str class (§[4.6](about://ch04_pg0019.xhtml#P70010153810000000000000000018E5)).

4.14 To program using characters and strings (§[4.7.1](about://ch04_pg0023.xhtml#P7001015381000000000000000001A05)).

4.15 To invoke the print function with the end argument (§[4.3.4](about://ch04_pg0008.xhtml#P7001015381000000000000000001752)).

--- Chapter 5 ---

5.1 To write programs for executing statements repeatedly using a while loop (§[5.2](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch05_pg0003.xhtml#P7001015381000000000000000001E16)).

**Week 9**

--- Chapter 5 ---

5.2 To control a loop with the user’s confirmation and a sentinel value (§[5.5](about://ch05_pg0006.xhtml#P7001015381000000000000000001EDE)).

5.3 To develop loops following the loop design strategy (§[5.4](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch05_pg0005.xhtml#P7001015381000000000000000001EB9)).

5.4 To use for loops to implement counter-controlled loops (§[5.6](about://ch05_pg0007.xhtml#P7001015381000000000000000001F2E)).

5.6 To implement program control with break. (§[5.10](about://ch05_pg0011.xhtml#P7001015381000000000000000002091)).

**Week 10**

--- Chapter 6 ---

6.1 To understand what is a function (§[6.1](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch06_pg0003.xhtml))

6.2 To define functions with formal parameters (§[6.2](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch06_pg0003.xhtml)).

6.3 To distinguish the differences between the functions that return and do not return a value (§[6.4](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch06_pg0005.xhtml)).

6.4 To invoke functions with actual parameters (i.e., arguments) (§[6.3](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch06_pg0004.xhtml)).

6.5 To determine the scope of variables (§[6.8](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch06_pg0009.xhtml))

**Week 11**

--- Chapter 6 ---

6.6 To invoke a function using positional arguments or keyword arguments (§6.5)

6.7 To invoke functions defined from another program (§6.7)

6.8 To apply the concept of function in software development and design (§6.13)

**Week 12**

--- Chapter 7 ---

7.1 To describe why lists are useful in programming (§[7.1](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch07_pg0002.xhtml)).

7.2 To learn how to create lists (§[7.2](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch07_pg0003.xhtml)).

7.3 To use the len, min, max, sum, and random.shuffle functions with a list (§[7.2.2](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch07_pg0005.xhtml)).

7.4 To access list elements by using indexed variables (§[7.2.3](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch07_pg0006.xhtml)).

7.5 To obtain a sublist from a larger list by using the slicing operator [start : end : step] (§[7.2.4](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch07_pg0007.xhtml)).

7.6 To use the + (concatenation), \* (repetition), and in/not in operator

7.7 To traverse elements in a list using a for loop (§[7.2.6](https://revel-ise.pearson.com/eps/sanvan/api/item/d8b7c6af-d0aa-4ead-8cc3-091aee26113e/1/file/liang-p-1e_Revel_v3/OPS/xhtml/ch07_pg0009.xhtml)).