4COSC006C: Software Development I

– APPENDIX 1 – TEST PLANS

Student Name/ID: Shanmugaratnam Mohanaranjan
IIT ID:- 20200607
UOW : 18705841

Seminar Day/Time: 2021.12.08

Module Tutor: Aponso Achala Chathuranga
: TG Deshan Koshala Sumanathilaka

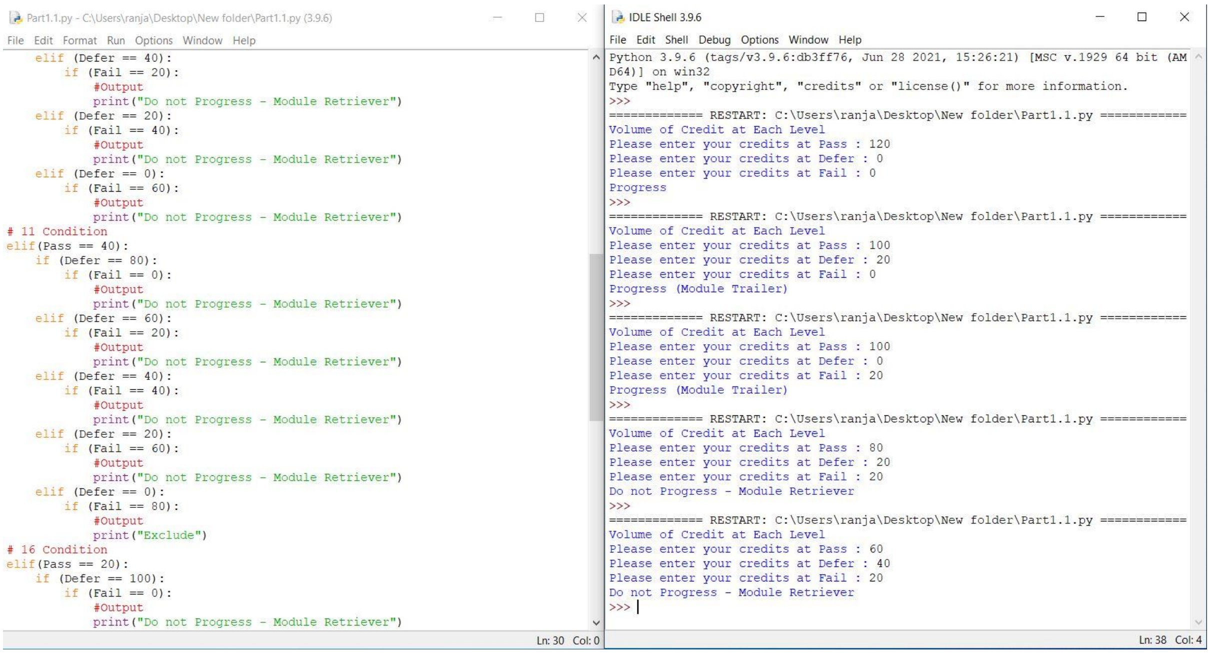
Part 1 - Main Version Outcomes

1. The program should allow students to predict their progression outcome at the end of each academic year. The program should prompt for the number of credits at pass, defer and fail and then display the appropriate progression outcome for an individual student (i.e., progress, trailing, module retriever or exclude).

Python Code

```
# CourseWork
# Part 1.1
# Create Variables
Pass = 0
Defer = 0
Fail = 0
# Input Variables
print("Volume of Credit at Each Level")
Pass = int(input("Please enter your credits at Pass : "))
Defer = int(input("Please enter your credits at Defer : "))
Fail = int(input("Please enter your credits at Fail : "))

#Process
# 1 Condition
if (Pass == 120):
    if (Defer == 0):
        if (Fail == 0):
            #Output
            print("Progress")
# 2 Condition
elif(Pass == 100):
    if (Defer == 20):
        if (Fail == 0):
            #Output
            print("Progress (Module Trailer)")
    elif (Defer == 0):
        if (Fail == 20):
            #Output
            print("Progress (Module Trailer)")
# 4 Condition
elif(Pass == 80):
    if (Defer == 40):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 20):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 0):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
# 7 Condition
elif(Pass == 60):
    if (Defer == 60):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 40):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 20):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 0):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
# 11 Condition
elif(Pass == 40):
    if (Defer == 80):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 60):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 40):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 20):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 0):
        if (Fail == 80):
            #Output
            print("Exclude")
# 16 Condition
elif(Pass == 20):
    if (Defer == 100):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 80):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 60):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 40):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 20):
        if (Fail == 80):
            #Output
            print("Exclude")
    elif (Defer == 0):
        if (Fail == 100):
            #Output
            print("Exclude")
# 22 Condition
elif(Pass == 0):
    if (Defer == 120):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 100):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 80):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 60):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 40):
        if (Fail == 80):
            #Output
            print("Exclude")
    elif (Defer == 20):
        if (Fail == 100):
            #Output
            print("Exclude")
    elif (Defer == 0):
        if (Fail == 120):
            #Output
            print("Exclude")
# End of Program
```

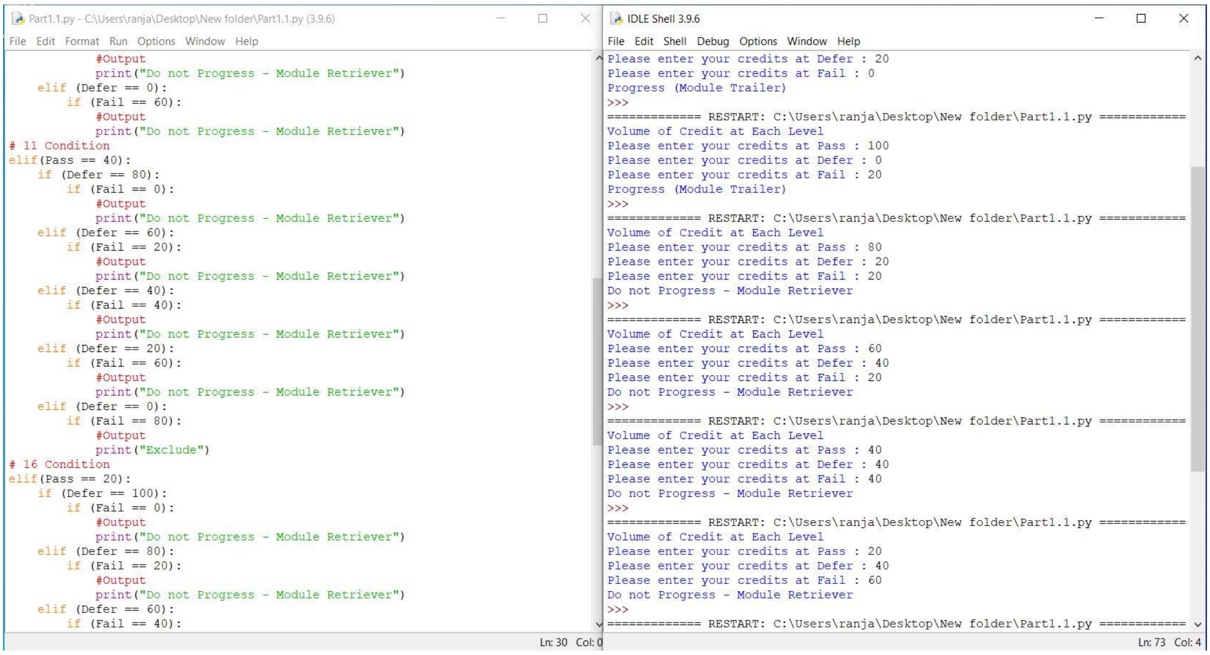
Screen Shots



Part1.1.py - C:\Users\ranja\Desktop\New folder\Part1.1.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 30 Col: 0
IDLE Shell 3.9.6
File Edit Shell Debug Options Window Help
Ln: 38 Col: 4

```
    elif (Defer == 40):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 20):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 0):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
# 11 Condition
elif(Pass == 40):
    if (Defer == 80):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 60):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 40):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 20):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 0):
        if (Fail == 80):
            #Output
            print("Exclude")
# 16 Condition
elif(Pass == 20):
    if (Defer == 100):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
```

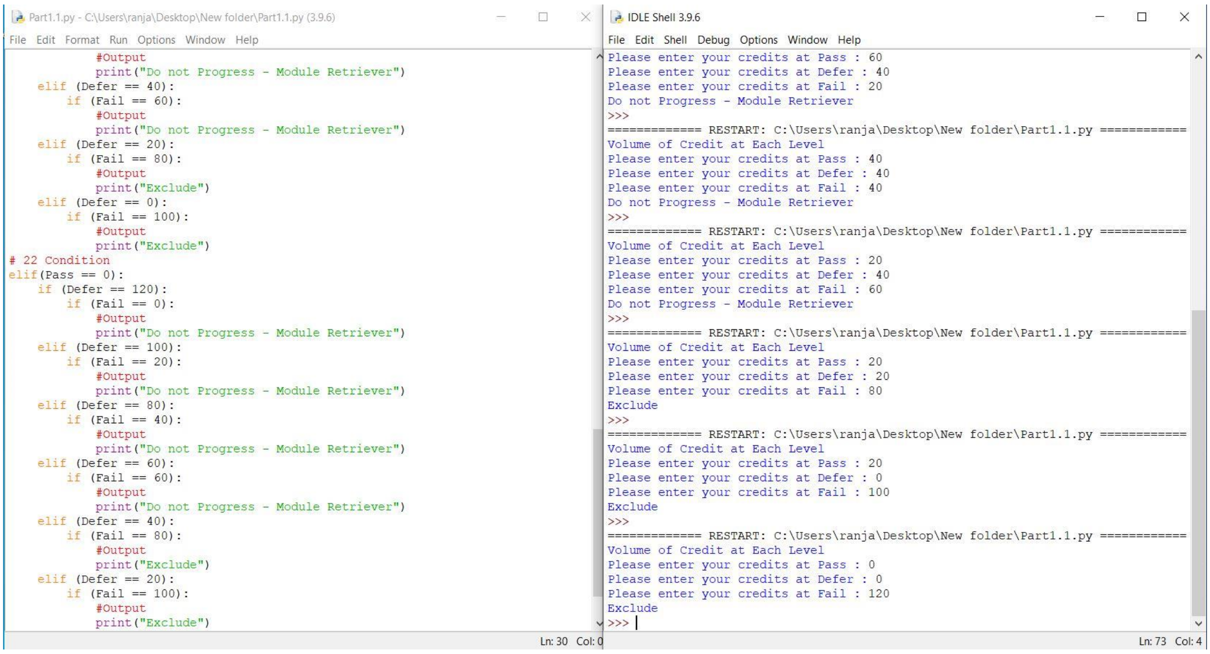
```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 120
Please enter your credits at Defer : 0
Please enter your credits at Fail : 0
Progress
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 100
Please enter your credits at Defer : 20
Please enter your credits at Fail : 0
Progress (Module Trailer)
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 100
Please enter your credits at Defer : 0
Please enter your credits at Fail : 20
Progress (Module Trailer)
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 80
Please enter your credits at Defer : 20
Please enter your credits at Fail : 20
Do not Progress - Module Retriever
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 60
Please enter your credits at Defer : 40
Please enter your credits at Fail : 20
Do not Progress - Module Retriever
>>>
```



Part1.1.py - C:\Users\ranja\Desktop\New folder\Part1.1.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 30 Col: 0
IDLE Shell 3.9.6
File Edit Shell Debug Options Window Help
Ln: 73 Col: 4

```
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 0):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
# 11 Condition
elif(Pass == 40):
    if (Defer == 80):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 60):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 40):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 20):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 0):
        if (Fail == 80):
            #Output
            print("Exclude")
# 16 Condition
elif(Pass == 20):
    if (Defer == 100):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 80):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 60):
        if (Fail == 40):
```

```
Please enter your credits at Defer : 20
Please enter your credits at Fail : 0
Progress (Module Trailer)
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 100
Please enter your credits at Defer : 0
Please enter your credits at Fail : 20
Progress (Module Trailer)
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 80
Please enter your credits at Defer : 20
Please enter your credits at Fail : 20
Do not Progress - Module Retriever
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 60
Please enter your credits at Defer : 40
Please enter your credits at Fail : 20
Do not Progress - Module Retriever
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 40
Please enter your credits at Defer : 40
Please enter your credits at Fail : 40
Do not Progress - Module Retriever
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 20
Please enter your credits at Defer : 40
Please enter your credits at Fail : 60
Do not Progress - Module Retriever
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
```



Part1.1.py - C:\Users\ranja\Desktop\New folder\Part1.1.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 30 Col: 0
IDLE Shell 3.9.6
File Edit Shell Debug Options Window Help
Ln: 73 Col: 4

```python
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 40):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 20):
        if (Fail == 80):
            #Output
            print("Exclude")
    elif (Defer == 0):
        if (Fail == 100):
            #Output
            print("Exclude")
# 22 Condition
elif(Pass == 0):
    if (Defer == 120):
        if (Fail == 0):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 100):
        if (Fail == 20):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 80):
        if (Fail == 40):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 60):
        if (Fail == 60):
            #Output
            print("Do not Progress - Module Retriever")
    elif (Defer == 40):
        if (Fail == 80):
            #Output
            print("Exclude")
    elif (Defer == 20):
        if (Fail == 100):
            #Output
            print("Exclude")
```

```
Please enter your credits at Pass : 60
Please enter your credits at Defer : 40
Please enter your credits at Fail : 20
Do not Progress - Module Retriever
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 40
Please enter your credits at Defer : 40
Please enter your credits at Fail : 40
Do not Progress - Module Retriever
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 20
Please enter your credits at Defer : 40
Please enter your credits at Fail : 60
Do not Progress - Module Retriever
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 20
Please enter your credits at Defer : 20
Please enter your credits at Fail : 80
Exclude
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 20
Please enter your credits at Defer : 0
Please enter your credits at Fail : 100
Exclude
>>>
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.1.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 0
Please enter your credits at Defer : 0
Please enter your credits at Fail : 120
Exclude
>>>
```

Student Name: Shanmugaratnam Mohanaranjan **Student ID: 20200607 UOW: 18705841**				
TEST PLAN for **Part 1** **Submit completed test plan with your code solution**				
Test No.	**Test Input**	**Expected Result**	**Actual Result (or state 'not attempted')**	**Pass / Fail ('Actual Result' matches 'Expected Result = Pass')**
1	**Pass = 120** **Defer = 0** **Fail = 0**	**'Progress' is displayed**	'Progress' is displayed	Pass
2	**Pass = 100** **Defer = 20** **Fail = 0**	**'Progress (module trailer)' displayed**	'Progress (module trailer)' displayed	Pass
3	**Pass = 100** **Defer = 0** **Fail = 20**	**'Progress (module trailer)' displayed**	'Progress (module trailer)' displayed	Pass
4	**Pass = 80** **Defer = 20** **Fail = 20**	**'Module retriever' is displayed**	'Module retriever' is displayed	Pass
5	**Pass = 60** **Defer = 40** **Fail = 20**	**'Module retriever' is displayed**	'Module retriever' is displayed	Pass
6	**Pass = 40** **Defer = 40** **Fail = 40**	**'Module retriever' is displayed**	'Module retriever' is displayed	Pass
7	**Pass = 20** **Defer = 40** **Fail = 60**	**'Module retriever' is displayed**	'Module retriever' is displayed	Pass
8	**Pass = 20** **Defer = 20** **Fail = 80**	**'Exclude' displayed**	'Exclude' displayed	Pass
9	**Pass = 20** **Defer = 0** **Fail = 100**	**'Exclude' displayed**	'Exclude' displayed	Pass
10	**Pass = 0** **Defer = 0** **Fail = 120**	**'Exclude' displayed**	'Exclude' displayed	Pass

2. Validation

- **The program should display ‘Integer required’ if a credit input is the wrong data type.**
- **The program should display ‘Out of range’ if credits entered are not in the range 0, 20, 40, 60, 80, 100 and 120.**
- **The program should display ‘Total incorrect’ if the total of the pass, defer and fail credits is not 120.**
- **A few marks will be allocated for the efficient use of conditional statements. For example, the program does not need 28 conditional statements for 28 outcomes.**
- **An example of the program running with user input (shown in bold):**

```
Please enter your credits at pass: p
Integer required
Please enter your credits at pass: 140
Out of range. Please enter your credits at pass: 100
Please enter your credit at defer: 40
Please enter your credit at fail: 20
Total incorrect.
Please enter your credits at pass: 100
Please enter your credit at defer: 20
Please enter your credit at fail: 0
Progress (module trailer)
```

3. Multiple Outcomes & Histogram

- **The program loops to allow a staff member to predict progression outcomes for multiple students.**
- **The program should prompt for credits at pass, defer and fail and display the appropriate progression for each individual student until the staff member user enters ‘q’ to quit. Optionally you can use an input of ‘y’ to continue.**
- **When ‘q’ is entered, the program should produce a ‘histogram’ where each star represents a student who achieved a progress outcome in the category range: progress, trailing, module retriever and exclude. The histogram should relate to the data input entered by the staff member during the program run and work for any number of outcomes.**
- **Display the number of students for each progression category and the total number of students.**
- **Example of a program run and input (in bold). Note: program should exit on ‘q’ to quit. ‘y’ to continue shown in the example is optional and depends on your program structure.**

```
Staff Version with Histogram
Enter your total PASS credits: 120
Enter your total DEFER credits: 0
Enter your total FAIL credits: 0
Progress
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results: y
Enter your total PASS credits: 100
Enter your total DEFER credits: 0
Enter your total FAIL credits: 20
Progress (module trailer)
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results: y
Enter your total PASS credits: 80
Enter your total DEFER credits: 20
Enter your total FAIL credits: 20
Module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results: y
Enter your total PASS credits: 60
Enter your total DEFER credits: 0
Enter your total FAIL credits: 60
Module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results: y
Enter your total PASS credits: 40
Enter your total DEFER credits: 0
Enter your total FAIL credits: 80
Exclude Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results: q
------------------------------------------------------------
Horizontal Histogram
Progress 1 : *
Trailer 1 : *
Retriever 2 : **
Excluded 1 : *
5 outcomes in total.
 ------------------------------------------------------------
```

- **Submit the completed part 1 test plan provided with your final part 1 solution.**

Part 2 - Vertical Histogram (extension)

Extend your program to add a vertical histogram
(stars in a category should go downwards),
e.g.; Progress Trailing Retriever Excluded
*** * * * * •**
If attempted, the code for both staff versions (Part 1 and Part 2) must be in your program and submitted for marking.

- **Submit the completed test plan provided with your final part 2 solution.**

Part 3 - List/Tuple/Directory (extension)
Extend your solution so that the program uses Python to save the input progression data to a list, tuple or directory. Then access the stored data from the list, tuple, directory and print the data in the following format below.
Output: The following should display after the histogram(s)
Progress - 120, 0, 0
Progress (module trailer) - 100, 0, 20
Module retriever - 80, 20, 20
Module retriever - 60, 0, 60
Exclude – 40, 0, 80
Submit the completed test plan provided with your final part 3 solution.

Part 4 - Text File For this part you could create an additional

Part 4 program or extending your original version. Use python to save input progression data to a text file. Later in the program, access the stored data and print out as shown below.
Example output (with data from text file):
Progress - 120, 0, 0
Progress (module trailer) - 100, 0, 20
Module retriever - 80, 20, 20
Module retriever - 60, 0, 60
Exclude – 40, 0, 80
Submit the completed test plan provided with your final part 4 solution.

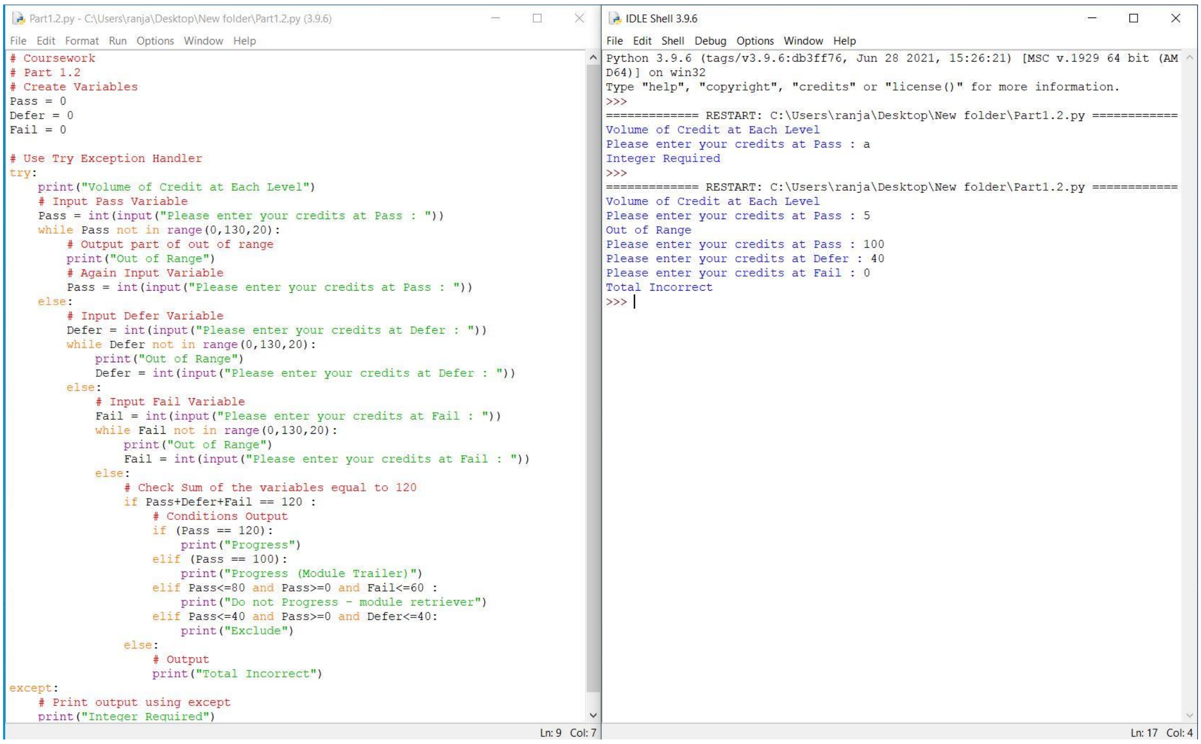
Part 1.2 Answers
Validation

Python Code

```
# Coursework
# Part 1.2
# Create Variables
Pass = 0
Defer = 0
Fail = 0

# Use Try Exception Handler
try:
    print("Volume of Credit at Each Level")
    # Input Pass Variable
    Pass = int(input("Please enter your credits at Pass : "))
    while Pass not in range(0,130,20):
        # Output part of out of range
        print("Out of Range")
        # Again Input Variable
        Pass = int(input("Please enter your credits at Pass : "))
    else:
        # Input Defer Variable
        Defer = int(input("Please enter your credits at Defer : "))
        while Defer not in range(0,130,20):
            print("Out of Range")
            Defer = int(input("Please enter your credits at Defer : "))
        else:
            # Input Fail Variable
            Fail = int(input("Please enter your credits at Fail : "))
            while Fail not in range(0,130,20):
                print("Out of Range")
                Fail = int(input("Please enter your credits at Fail : "))
            else:
                # Check Sum of the variables equal to 120
                if Pass+Defer+Fail == 120 :
                    # Conditions Output
                    if (Pass == 120):
                        print("Progress")
                    elif (Pass == 100):
                        print("Progress (Module Trailer)")
                    elif Pass<=80 and Pass>=0 and Fail<=60 :
                        print("Do not Progress – module retriever")
                    elif Pass<=40 and Pass>=0 and Defer<=40:
                        print("Exclude")
                else:
                    # Output
                    print("Total Incorrect")
```

```
except:
    # Print output using except
    print("Integer Required")
# End of Program
```

Screen Shot


Part1.2.py - C:\Users\ranja\Desktop\New folder\Part1.2.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 9 Col: 7
IDLE Shell 3.9.6
File Edit Shell Debug Options Window Help
Ln: 17 Col: 4

```
# Coursework
# Part 1.2
# Create Variables
Pass = 0
Defer = 0
Fail = 0

# Use Try Exception Handler
try:
    print("Volume of Credit at Each Level")
    # Input Pass Variable
    Pass = int(input("Please enter your credits at Pass : "))
    while Pass not in range(0,130,20):
        # Output part of out of range
        print("Out of Range")
        # Again Input Variable
        Pass = int(input("Please enter your credits at Pass : "))
    else:
        # Input Defer Variable
        Defer = int(input("Please enter your credits at Defer : "))
        while Defer not in range(0,130,20):
            print("Out of Range")
            Defer = int(input("Please enter your credits at Defer : "))
        else:
            # Input Fail Variable
            Fail = int(input("Please enter your credits at Fail : "))
            while Fail not in range(0,130,20):
                print("Out of Range")
                Fail = int(input("Please enter your credits at Fail : "))
            else:
                # Check Sum of the variables equal to 120
                if Pass+Defer+Fail == 120 :
                    # Conditions Output
                    if (Pass == 120):
                        print("Progress")
                    elif (Pass == 100):
                        print("Progress (Module Trailer)")
                    elif Pass<=80 and Pass>=0 and Fail<=60 :
                        print("Do not Progress - module retriever")
                    elif Pass<=40 and Pass>=0 and Defer<=40:
                        print("Exclude")
                else:
                    # Output
                    print("Total Incorrect")
except:
    # Print output using except
    print("Integer Required")
```

```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> 
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.2.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : a
Integer Required
>>> 
============= RESTART: C:\Users\ranja\Desktop\New folder\Part1.2.py ============
Volume of Credit at Each Level
Please enter your credits at Pass : 5
Out of Range
Please enter your credits at Pass : 100
Please enter your credits at Defer : 40
Please enter your credits at Fail : 0
Total Incorrect
>>> |
```

Validation

11	**Pass = a**	**‘Integer required’ displayed**	‘Integer required’ displayed	Pass
12	**Pass = 5**	**‘Integer required’ displayed**	‘Integer required’ displayed	Pass
13	**Pass = 100** **Defer = 40** **Fail = 0**	**‘Total incorrect’ displayed**	‘Total incorrect’ displayed	Pass

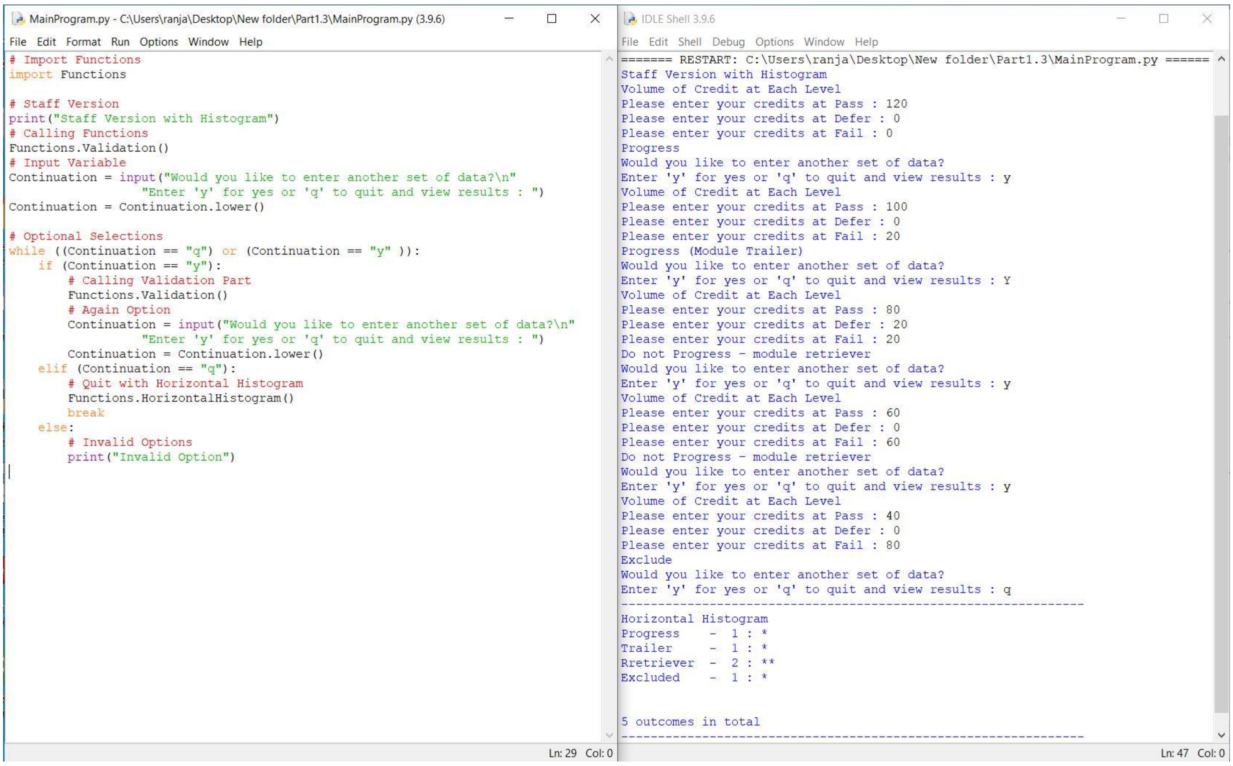
Part 1.3 Answers
Multiple Outcomes & Histogram

Python Code

```
# Main Program

# Import Functions
import Functions

# Staff Version
print("Staff Version with Histogram")
# Calling Functions
Functions.Validation()
# Input Variable
Continuation = input("Would you like to enter another set of data?\n"
          "Enter 'y' for yes or 'q' to quit and view results : ")
Continuation = Continuation.lower()

# Optional Selections
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        # Calling Validation Part
        Functions.Validation()
        # Again Option
        Continuation = input("Would you like to enter another set of data?\n"
          "Enter 'y' for yes or 'q' to quit and view results : ")
        Continuation = Continuation.lower()
    elif (Continuation == "q"):
        # Quit with Horizontal Histogram
        Functions.HorizontalHistogram()
        break
    else:
        # Invalid Options
        print("Invalid Option")
```

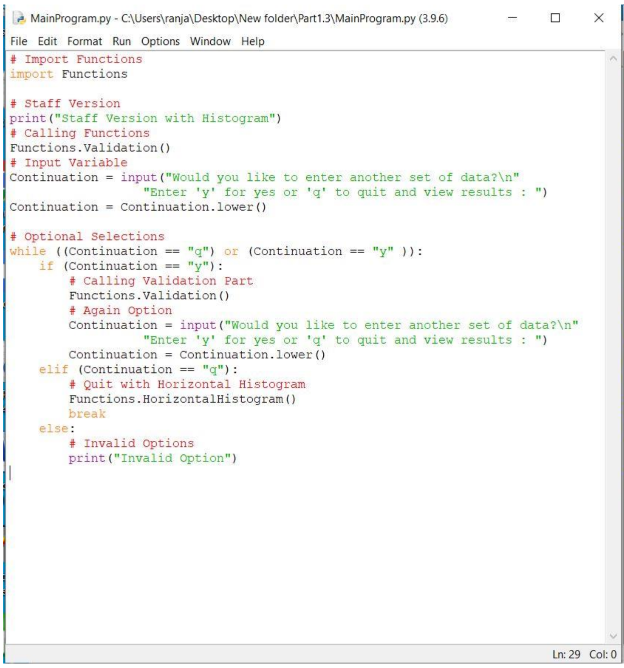
```
#  Define Functions Part

# Create Variables
CountTotal = 0
CountProgress = 0
CountTrailer = 0
CountRetriever = 0
CountExcluded = 0

# Define Functions
def Validation():
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    try:
        # Input with try exception part
        print("Volume of Credit at Each Level")
        Pass = int(input("Please enter your credits at Pass : "))
        while Pass not in range(0,130,20):
            print("Out of Range")
            Pass = int(input("Please enter your credits at Pass : "))
        else:
            Defer = int(input("Please enter your credits at Defer : "))
            while Defer not in range(0,130,20):
                print("Out of Range")
                Defer = int(input("Please enter your credits at Defer : "))
            else:
                Fail = int(input("Please enter your credits at Fail : "))
                while Fail not in range(0,130,20):
                    print("Out of Range")
                    Fail = int(input("Please enter your credits at Fail : "))
                else:
                    if Pass+Defer+Fail == 120 :
                        # Main Outcomes
                        if (Pass == 120):
                            print("Progress")
                            CountTotal = CountTotal + 1
                            CountProgress += 1
                        elif (Pass == 100):
                            print("Progress (Module Trailer)")
                            CountTotal += 1
                            CountTrailer += 1
                        elif Pass<=80 and Pass>=0 and Fail<=60 :
                            print("Do not Progress – module retriever")
                            CountTotal += 1
                            CountRetriever += 1
            elif Pass<=40 and Pass>=0 and Defer<=40:
                print("Exclude")
                CountTotal += 1
                CountExcluded += 1

        else:
            print("Total Incorrect")
    except():
        print("Integer Required")


# Define Horizontal Histogram
def HorizontalHistogram():
    Star="*"
    print("--------------------------------------------------------------")
    print("Horizontal Histogram")
    print("Progress    - ",CountProgress,":",(CountProgress*Star))
    print("Trailer     - ",CountTrailer,":",(CountTrailer*Star))
    print("Rretriever  - ",CountRetriever,":",(CountRetriever*Star))
    print("Excluded    - ",CountExcluded,":",(CountExcluded*Star))
    print()
    print()
    print(CountTotal,"outcomes in total")
    print("--------------------------------------------------------------")

# End of Program
```

Screen Shots

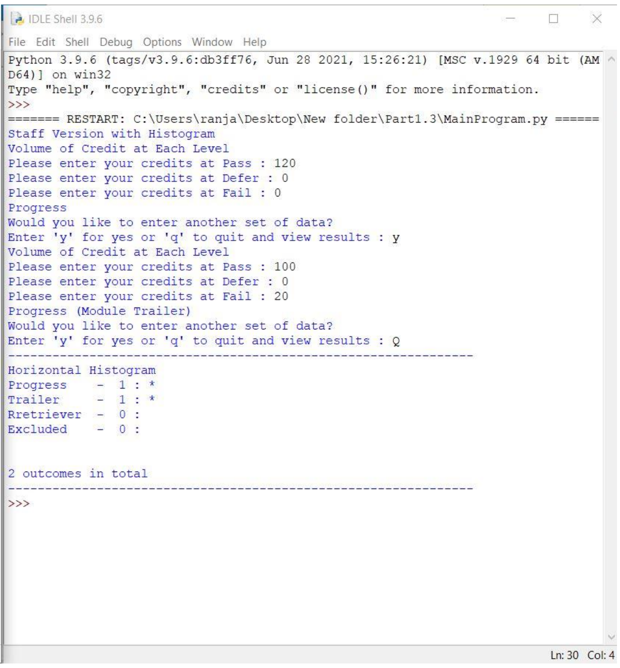

MainProgram.py - C:\Users\ranja\Desktop\New folder\Part1.3\MainProgram.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 29 Col: 0
IDLE Shell 3.9.6
File Edit Shell Debug Options Window Help
Ln: 47 Col: 0

```
# Import Functions
import Functions

# Staff Version
print("Staff Version with Histogram")
# Calling Functions
Functions.Validation()
# Input Variable
Continuation = input("Would you like to enter another set of data?\n"
                     "Enter 'y' for yes or 'q' to quit and view results : ")
Continuation = Continuation.lower()

# Optional Selections
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        # Calling Validation Part
        Functions.Validation()
        # Again Option
        Continuation = input("Would you like to enter another set of data?\n"
                     "Enter 'y' for yes or 'q' to quit and view results : ")
        Continuation = Continuation.lower()
    elif (Continuation == "q"):
        # Quit with Horizontal Histogram
        Functions.HorizontalHistogram()
        break
    else:
        # Invalid Options
        print("Invalid Option")
```

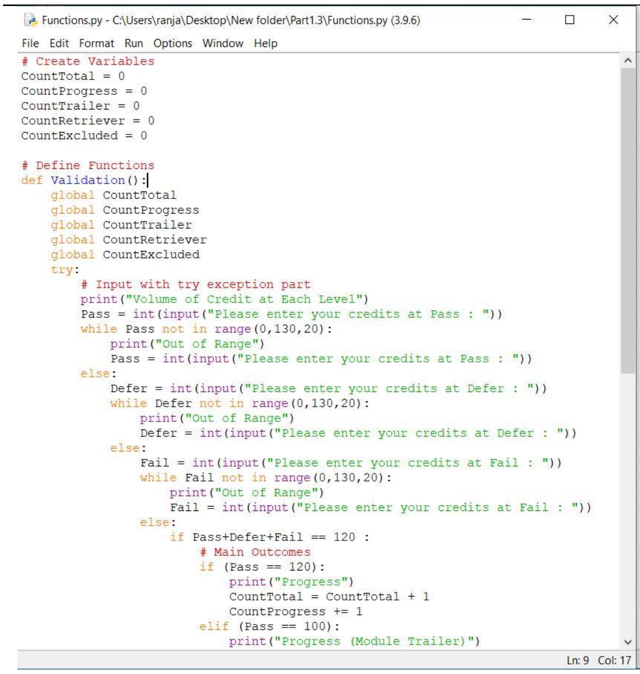
```
======= RESTART: C:\Users\ranja\Desktop\New folder\Part1.3\MainProgram.py ======
Staff Version with Histogram
Volume of Credit at Each Level
Please enter your credits at Pass : 120
Please enter your credits at Defer : 0
Please enter your credits at Fail : 0
Progress
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 100
Please enter your credits at Defer : 0
Please enter your credits at Fail : 20
Progress (Module Trailer)
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : Y
Volume of Credit at Each Level
Please enter your credits at Pass : 80
Please enter your credits at Defer : 20
Please enter your credits at Fail : 20
Do not Progress - module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 60
Please enter your credits at Defer : 0
Please enter your credits at Fail : 60
Do not Progress - module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 40
Please enter your credits at Defer : 0
Please enter your credits at Fail : 80
Exclude
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : q
---------------------------------------------------------------
Horizontal Histogram
Progress    -  1 : *
Trailer     -  1 : *
Rretriever  -  2 : **
Excluded    -  1 : *


5 outcomes in total
---------------------------------------------------------------
```


MainProgram.py - C:\Users\ranja\Desktop\New folder\Part1.3\MainProgram.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 29 Col: 0

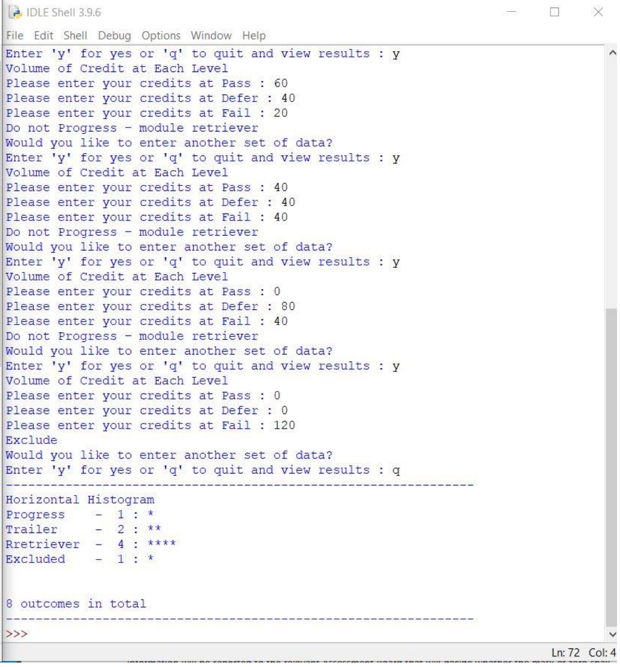
```python
# Import Functions
import Functions

# Staff Version
print("Staff Version with Histogram")
# Calling Functions
Functions.Validation()
# Input Variable
Continuation = input("Would you like to enter another set of data?\n"
                  "Enter 'y' for yes or 'q' to quit and view results : ")
Continuation = Continuation.lower()

# Optional Selections
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        # Calling Validation Part
        Functions.Validation()
        # Again Option
        Continuation = input("Would you like to enter another set of data?\n"
                  "Enter 'y' for yes or 'q' to quit and view results : ")
        Continuation = Continuation.lower()
    elif (Continuation == "q"):
        # Quit with Horizontal Histogram
        Functions.HorizontalHistogram()
        break
    else:
        # Invalid Options
        print("Invalid Option")
```



```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> 
======= RESTART: C:\Users\ranja\Desktop\New folder\Part1.3\MainProgram.py ======
Staff Version with Histogram
Volume of Credit at Each Level
Please enter your credits at Pass : 120
Please enter your credits at Defer : 0
Please enter your credits at Fail : 0
Progress
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 100
Please enter your credits at Defer : 0
Please enter your credits at Fail : 20
Progress (Module Trailer)
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : Q
---------------------------------------------------------------
Horizontal Histogram
Progress    -  1 : *
Trailer     -  1 : *
Rretriever  -  0 :
Excluded    -  0 :


2 outcomes in total
---------------------------------------------------------------
>>> 
```


Functions.py - C:\Users\ranja\Desktop\New folder\Part1.3\Functions.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 9 Col: 17

```
# Create Variables
CountTotal = 0
CountProgress = 0
CountTrailer = 0
CountRetriever = 0
CountExcluded = 0

# Define Functions
def Validation():
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    try:
        # Input with try exception part
        print("Volume of Credit at Each Level")
        Pass = int(input("Please enter your credits at Pass : "))
        while Pass not in range(0,130,20):
            print("Out of Range")
            Pass = int(input("Please enter your credits at Pass : "))
        else:
            Defer = int(input("Please enter your credits at Defer : "))
            while Defer not in range(0,130,20):
                print("Out of Range")
                Defer = int(input("Please enter your credits at Defer : "))
            else:
                Fail = int(input("Please enter your credits at Fail : "))
                while Fail not in range(0,130,20):
                    print("Out of Range")
                    Fail = int(input("Please enter your credits at Fail : "))
                else:
                    if Pass+Defer+Fail == 120 :
                        # Main Outcomes
                        if (Pass == 120):
                            print("Progress")
                            CountTotal = CountTotal + 1
                            CountProgress += 1
                        elif (Pass == 100):
                            print("Progress (Module Trailer)")
```



```
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 60
Please enter your credits at Defer : 40
Please enter your credits at Fail : 20
Do not Progress - module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 40
Please enter your credits at Defer : 40
Please enter your credits at Fail : 40
Do not Progress - module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 0
Please enter your credits at Defer : 80
Please enter your credits at Fail : 40
Do not Progress - module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 0
Please enter your credits at Defer : 0
Please enter your credits at Fail : 120
Exclude
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : q
---------------------------------------------------------------
Horizontal Histogram
Progress    -  1 : *
Trailer     -  2 : **
Rretriever  -  4 : ****
Excluded    -  1 : *


8 outcomes in total
---------------------------------------------------------------
>>>
```

Displaying Histogram

14	**Program loops**	**Predicts multiple progression outcomes**	Predicts multiple progression outcomes	Pass
15	**Enter ‘q’ to quit**	**Exits loop**	Exits loop	Pass
16	**Exit loop**	**Progress 1 : *** **Trailer 2 : **** **Retriever 4 : ****** **Excluded 1 : *** **8 outcomes in total.**	Progress 1 : * Trailer 2 : ** Retriever 4 : **** Excluded 1 : * 8 outcomes in total.	Pass

Part 2 - Vertical Histogram (extension) Answers

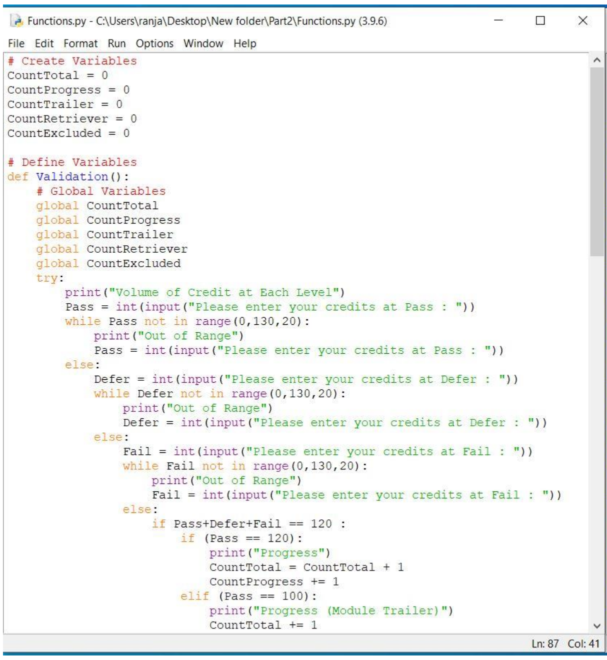
Staff Version

Python Code

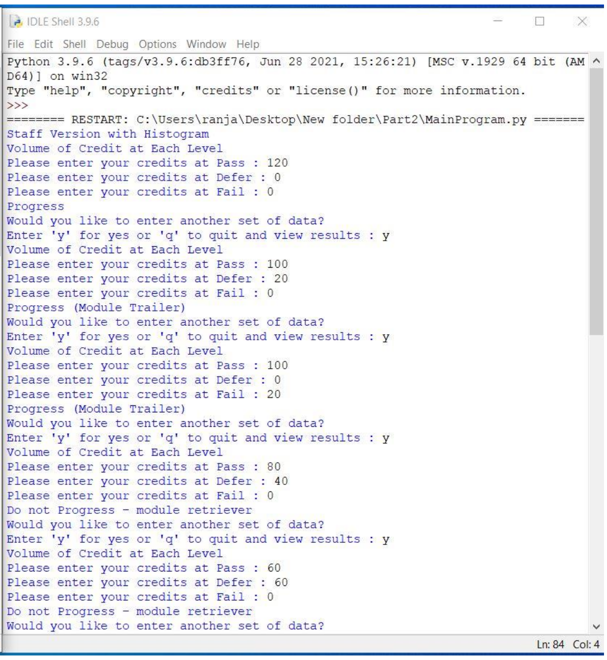
```
# Import Functions
import Functions

# Staff Version
print("Staff Version with Histogram")
# Calling Function
Functions.Validation()
# Input Variable
Continuation = input("Would you like to enter another set of data?\n"
                 "Enter 'y' for yes or 'q' to quit and view results : ")
Continuation = Continuation.lower()
# Selection for more inputs and outputs
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        #  Calling Validating Function
        Functions.Validation()
        # Again Input
        Continuation = input("Would you like to enter another set of data?\n"
                 "Enter 'y' for yes or 'q' to quit and view results : ")
        Continuation = Continuation.lower()
    # Exit loop
    elif (Continuation == "q"):
        Functions.HorizontalHistogram()
        Functions.VerticalHistogram ()
        break
    else:
        print("Invalid Option")
```

```
# Functions Define Part

# Create Variables
CountTotal = 0
CountProgress = 0
CountTrailer = 0
CountRetriever = 0
CountExcluded = 0

# Define Variables
def Validation():
    # Global Variables
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    try:
        print("Volume of Credit at Each Level")
        Pass = int(input("Please enter your credits at Pass : "))
        while Pass not in range(0,130,20):
            print("Out of Range")
            Pass = int(input("Please enter your credits at Pass : "))
        else:
            Defer = int(input("Please enter your credits at Defer : "))
            while Defer not in range(0,130,20):
                print("Out of Range")
                Defer = int(input("Please enter your credits at Defer : "))
            else:
                Fail = int(input("Please enter your credits at Fail : "))
                while Fail not in range(0,130,20):
                    print("Out of Range")
                    Fail = int(input("Please enter your credits at Fail : "))
                else:
                    if Pass+Defer+Fail == 120 :
                        if (Pass == 120):
                            print("Progress")
                            CountTotal = CountTotal + 1
                            CountProgress += 1
                        elif (Pass == 100):
                            print("Progress (Module Trailer)")
                            CountTotal += 1
                            CountTrailer += 1
                        elif Pass<=80 and Pass>=0 and Fail<=60 :
                            print("Do not Progress – module retriever")
                            CountTotal += 1
                            CountRetriever += 1
                        elif Pass<=40 and Pass>=0 and Defer<=40:
                            print("Exclude")
                            CountTotal += 1
                            CountExcluded += 1

                    else:
                        print("Total Incorrect")
    except():
        print("Integer Required")


# Definr the Horizontal Histogram
def HorizontalHistogram():
    Star="*"
    print("--------------------------------------------------------------")
    print("Horizontal Histogram")
    print("Progress    - ",CountProgress,":",(CountProgress*Star))
    print("Trailer     - ",CountTrailer,":",(CountTrailer*Star))
    print("Rretriever  - ",CountRetriever,":",(CountRetriever*Star))
    print("Excluded    - ",CountExcluded,":",(CountExcluded*Star))
    print()
    print()
    print(CountTotal,"outcomes in total")
    print("--------------------------------------------------------------")


# Define Vertical Histogram
def VerticalHistogram ():
    # Global Variables
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    Star="*"
    Space=" "
    Row1=""
    Row2=""
    Row3=""
    Row4=""
    print("Vertical Histogram")
    # Put Headings
    print ("Progress","Trailer","Retriever","Excluded")
    # Print Stars
    while CountTotal != 0:
        if CountProgress > 0 :
            Row1=(Space*3+"*")
            CountProgress -= 1
        else:
            Row1=(Space*4)
        if CountTrailer > 0:
            Row2=(Space*7+"*")
            CountTrailer -= 1
        else:
            Row2=(Space*8)
        if CountRetriever > 0:
            Row3=(Space*7+"*")
            CountRetriever -= 1
        else:
            Row3=(Space*8)
        if CountExcluded > 0:
            Row4=(Space*7+"*")
            CountExcluded -= 1
        else:
            Row4=(Space*8)
        # Output
        print(Row1,Row2,Row3,Row4)
        # Increment or Update Variable
        CountTotal = CountTotal - 1

    print("----------------------------------------------------------------")

# End of Program
```

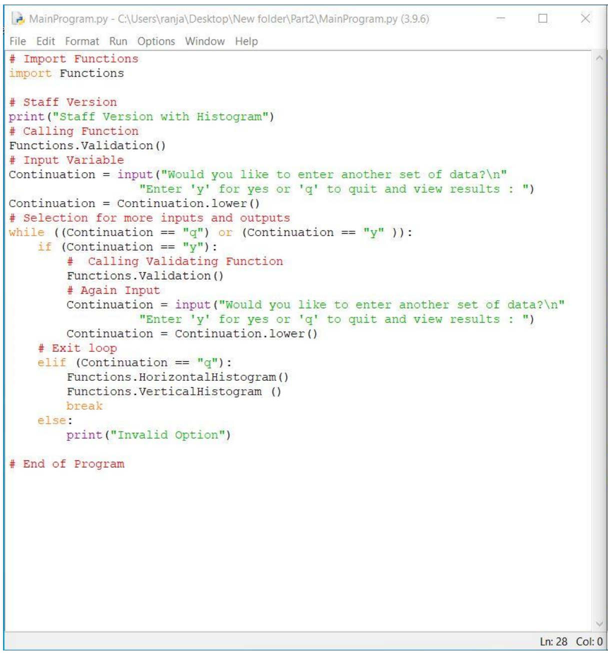
Screen Shots



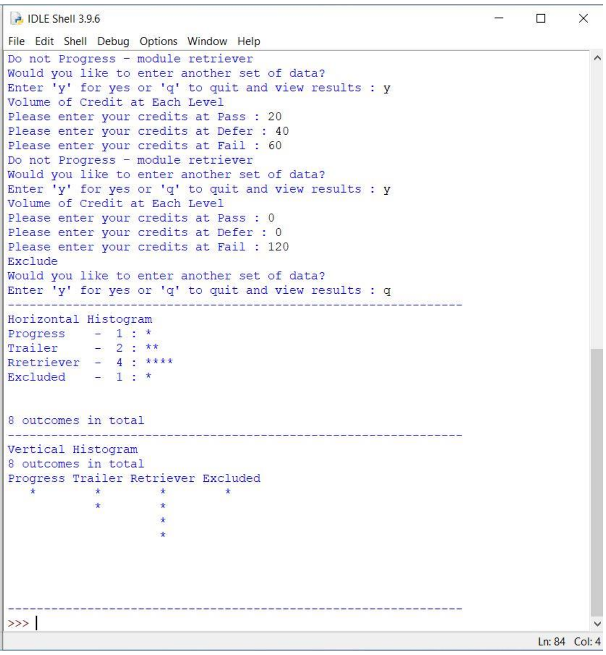
```
# Create Variables
CountTotal = 0
CountProgress = 0
CountTrailer = 0
CountRetriever = 0
CountExcluded = 0

# Define Variables
def Validation():
    # Global Variables
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    try:
        print("Volume of Credit at Each Level")
        Pass = int(input("Please enter your credits at Pass : "))
        while Pass not in range(0,130,20):
            print("Out of Range")
            Pass = int(input("Please enter your credits at Pass : "))
        else:
            Defer = int(input("Please enter your credits at Defer : "))
            while Defer not in range(0,130,20):
                print("Out of Range")
                Defer = int(input("Please enter your credits at Defer : "))
            else:
                Fail = int(input("Please enter your credits at Fail : "))
                while Fail not in range(0,130,20):
                    print("Out of Range")
                    Fail = int(input("Please enter your credits at Fail : "))
                else:
                    if Pass+Defer+Fail == 120 :
                        if (Pass == 120):
                            print("Progress")
                            CountTotal = CountTotal + 1
                            CountProgress += 1
                        elif (Pass == 100):
                            print("Progress (Module Trailer)")
                            CountTotal += 1
```



```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
======== RESTART: C:\Users\ranja\Desktop\New folder\Part2\MainProgram.py =======
Staff Version with Histogram
Volume of Credit at Each Level
Please enter your credits at Pass : 120
Please enter your credits at Defer : 0
Please enter your credits at Fail : 0
Progress
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 100
Please enter your credits at Defer : 20
Please enter your credits at Fail : 0
Progress (Module Trailer)
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 100
Please enter your credits at Defer : 0
Please enter your credits at Fail : 20
Progress (Module Trailer)
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 80
Please enter your credits at Defer : 40
Please enter your credits at Fail : 0
Do not Progress - module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 60
Please enter your credits at Defer : 60
Please enter your credits at Fail : 0
Do not Progress - module retriever
Would you like to enter another set of data?
```



```
# Import Functions
import Functions

# Staff Version
print("Staff Version with Histogram")
# Calling Function
Functions.Validation()
# Input Variable
Continuation = input("Would you like to enter another set of data?\n"
                  "Enter 'y' for yes or 'q' to quit and view results : ")
Continuation = Continuation.lower()
# Selection for more inputs and outputs
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        #  Calling Validating Function
        Functions.Validation()
        # Again Input
        Continuation = input("Would you like to enter another set of data?\n"
                  "Enter 'y' for yes or 'q' to quit and view results : ")
        Continuation = Continuation.lower()
    # Exit loop
    elif (Continuation == "q"):
        Functions.HorizontalHistogram()
        Functions.VerticalHistogram ()
        break
    else:
        print("Invalid Option")

# End of Program
```



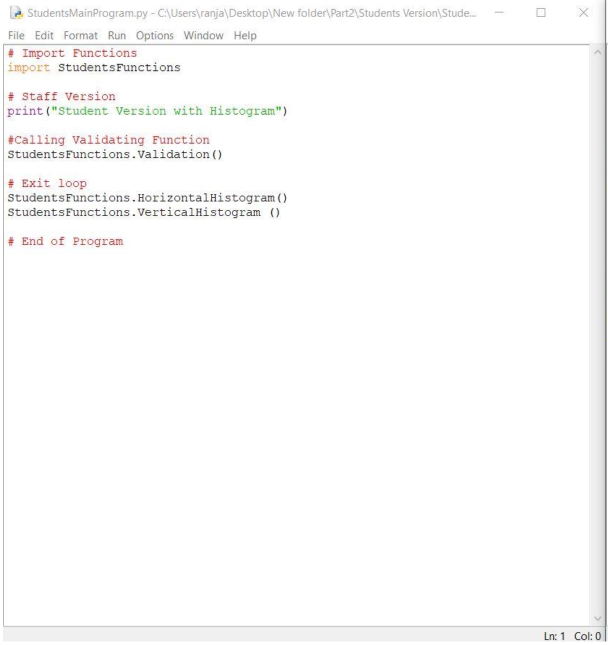
```
Do not Progress - module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 20
Please enter your credits at Defer : 40
Please enter your credits at Fail : 60
Do not Progress - module retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 0
Please enter your credits at Defer : 0
Please enter your credits at Fail : 120
Exclude
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : q
---------------------------------------------------------------
Horizontal Histogram
Progress    -  1 : *
Trailer     -  2 : **
Rretriever  -  4 : ****
Excluded    -  1 : *


8 outcomes in total
---------------------------------------------------------------
Vertical Histogram
8 outcomes in total
Progress Trailer Retriever Excluded
   *        *        *        *
            *        *
                     *
                     *




---------------------------------------------------------------
>>> |
```

Student Version

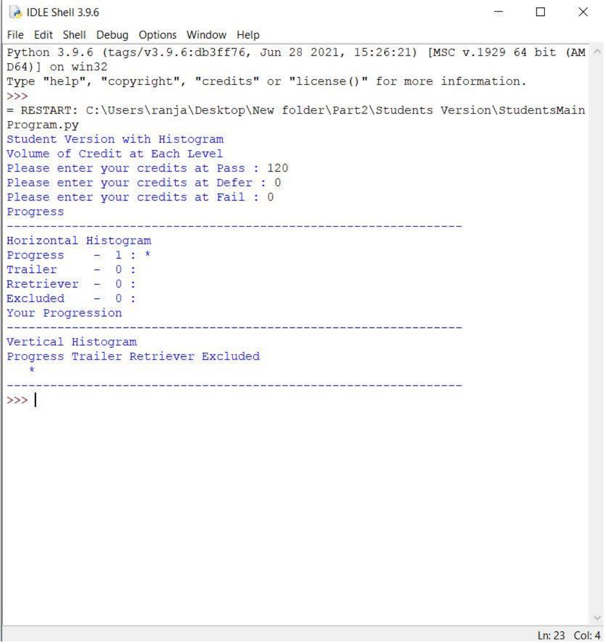
Python Code

```
# Import Functions
import StudentsFunctions

# Staff Version
print("Student Version with Histogram")

#Calling Validating Function
StudentsFunctions.Validation()

# Exit loop
StudentsFunctions.HorizontalHistogram()
StudentsFunctions.VerticalHistogram ()

# Function Part

# Create Variables
CountTotal = 0
CountProgress = 0
CountTrailer = 0
CountRetriever = 0
CountExcluded = 0

# Define Variables
def Validation():
    # Global Variables
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    try:
        print("Volume of Credit at Each Level")
        Pass = int(input("Please enter your credits at Pass : "))
        while Pass not in range(0,130,20):
            print("Out of Range")
            Pass = int(input("Please enter your credits at Pass : "))
        else:
            Defer = int(input("Please enter your credits at Defer : "))
            while Defer not in range(0,130,20):
                print("Out of Range")
                Defer = int(input("Please enter your credits at Defer : "))
            else:
                Fail = int(input("Please enter your credits at Fail : "))
                while Fail not in range(0,130,20):
                    print("Out of Range")
                    Fail = int(input("Please enter your credits at Fail : "))
                else:
                    if Pass+Defer+Fail == 120 :
                        if (Pass == 120):
                            print("Progress")
                            CountTotal = CountTotal + 1
                            CountProgress += 1
                        elif (Pass == 100):
                            print("Progress (Module Trailer)")
                            CountTotal += 1
                            CountTrailer += 1
                        elif Pass<=80 and Pass>=0 and Fail<=60 :
                            print("Do not Progress – module retriever")
                            CountTotal += 1
                            CountRetriever += 1
                        elif Pass<=40 and Pass>=0 and Defer<=40:
                            print("Exclude")
                            CountTotal += 1
                            CountExcluded += 1

                    else:
                        print("Total Incorrect")
    except():
        print("Integer Required")


# Define the Horizontal Histogram
def HorizontalHistogram():
    Star="*"
    print("--------------------------------------------------------------")
    print("Horizontal Histogram")
    print("Progress    - ",CountProgress,":",(CountProgress*Star))
    print("Trailer     - ",CountTrailer,":",(CountTrailer*Star))
    print("Rretriever  - ",CountRetriever,":",(CountRetriever*Star))
    print("Excluded    - ",CountExcluded,":",(CountExcluded*Star))

    print("Your Progression")
    print("--------------------------------------------------------------")


# Define Vertical Histogram
def VerticalHistogram ():
    # Global Variables
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    Star="*"
    Space=" "
    Row1=""
    Row2=""
    Row3=""
    Row4=""
    print("Vertical Histogram")
    # Put Headings
    print ("Progress","Trailer","Retriever","Excluded")
    # Print Stars
    while CountTotal != 0:
        if CountProgress > 0 :
            Row1=(Space*3+"*")
            CountProgress -= 1
        else:
            Row1=(Space*4)
        if CountTrailer > 0:
            Row2=(Space*7+"*")
            CountTrailer -= 1
        else:
            Row2=(Space*8)
        if CountRetriever > 0:
            Row3=(Space*7+"*")
            CountRetriever -= 1
        else:
            Row3=(Space*8)
        if CountExcluded > 0:
            Row4=(Space*7+"*")
            CountExcluded -= 1
        else:
            Row4=(Space*8)
        # Output
        print(Row1,Row2,Row3,Row4)
        # Increment or Update Variable
        CountTotal = CountTotal - 1


    print("------------------------------------------------------------")


# End of Program
```

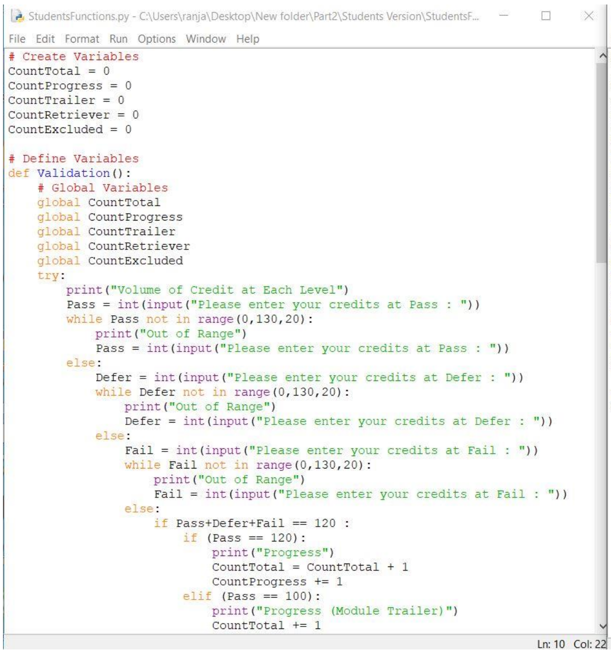
Screen Shots


StudentsMainProgram.py - C:\Users\ranja\Desktop\New folder\Part2\Students Version\Stude...
File Edit Format Run Options Window Help
Ln: 1 Col: 0

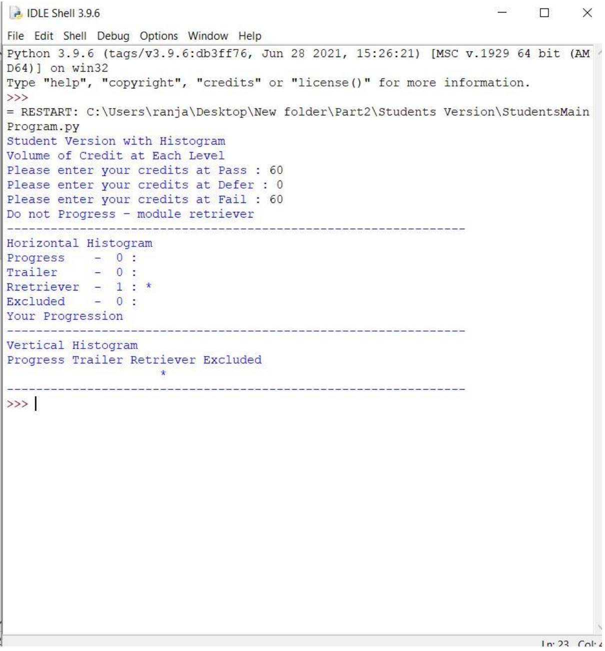
```
# Import Functions
import StudentsFunctions

# Staff Version
print("Student Version with Histogram")

#Calling Validating Function
StudentsFunctions.Validation()

# Exit loop
StudentsFunctions.HorizontalHistogram()
StudentsFunctions.VerticalHistogram ()

# End of Program
```



```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\ranja\Desktop\New folder\Part2\Students Version\StudentsMain
Program.py
Student Version with Histogram
Volume of Credit at Each Level
Please enter your credits at Pass : 120
Please enter your credits at Defer : 0
Please enter your credits at Fail : 0
Progress
---------------------------------------------------------------
Horizontal Histogram
Progress    -  1 : *
Trailer     -  0 :
Rretriever  -  0 :
Excluded    -  0 :
Your Progression
---------------------------------------------------------------
Vertical Histogram
Progress Trailer Retriever Excluded
   *
---------------------------------------------------------------
>>> |
```


StudentsFunctions.py - C:\Users\ranja\Desktop\New folder\Part2\Students Version\StudentsF...
File Edit Format Run Options Window Help
Ln: 10 Col: 22

```
# Create Variables
CountTotal = 0
CountProgress = 0
CountTrailer = 0
CountRetriever = 0
CountExcluded = 0

# Define Variables
def Validation():
    # Global Variables
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    try:
        print("Volume of Credit at Each Level")
        Pass = int(input("Please enter your credits at Pass : "))
        while Pass not in range(0,130,20):
            print("Out of Range")
            Pass = int(input("Please enter your credits at Pass : "))
        else:
            Defer = int(input("Please enter your credits at Defer : "))
            while Defer not in range(0,130,20):
                print("Out of Range")
                Defer = int(input("Please enter your credits at Defer : "))
            else:
                Fail = int(input("Please enter your credits at Fail : "))
                while Fail not in range(0,130,20):
                    print("Out of Range")
                    Fail = int(input("Please enter your credits at Fail : "))
                else:
                    if Pass+Defer+Fail == 120 :
                        if (Pass == 120):
                            print("Progress")
                            CountTotal = CountTotal + 1
                            CountProgress += 1
                        elif (Pass == 100):
                            print("Progress (Module Trailer)")
                            CountTotal += 1
```



```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\ranja\Desktop\New folder\Part2\Students Version\StudentsMain
Program.py
Student Version with Histogram
Volume of Credit at Each Level
Please enter your credits at Pass : 60
Please enter your credits at Defer : 0
Please enter your credits at Fail : 60
Do not Progress - module retriever
---------------------------------------------------------------
Horizontal Histogram
Progress    -  0 :
Trailer     -  0 :
Rretriever  -  1 : *
Excluded    -  0 :
Your Progression
---------------------------------------------------------------
Vertical Histogram
Progress Trailer Retriever Excluded
                     *
---------------------------------------------------------------
>>> |
```

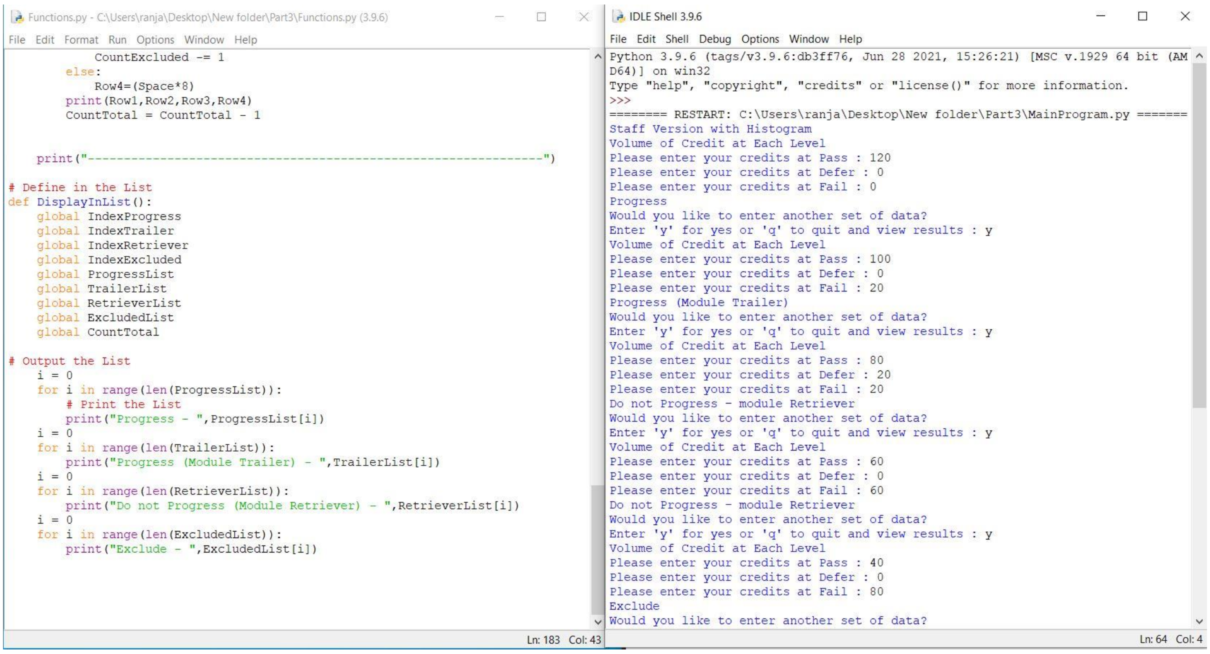
Part 3 - List/Tuple/Directory (extension) Answers

Python Code

```
# Import Functions
import Functions

# Calling Function
print("Staff Version with Histogram")
Functions.Validation()
Continuation = input("Would you like to enter another set of data?\n"
                     "Enter 'y' for yes or 'q' to quit and view results : ")
Continuation = Continuation.lower()
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        Functions.Validation()
        Continuation = input("Would you like to enter another set of data?\n"
                     "Enter 'y' for yes or 'q' to quit and view results : ")
        Continuation = Continuation.lower()
    elif (Continuation == "q"):
        Functions.HorizontalHistogram()
        Functions.VerticalHistogram ()
        # Calling the List
        Functions.DisplayInList()
        break
    else:
        print("Invalid Option")
```

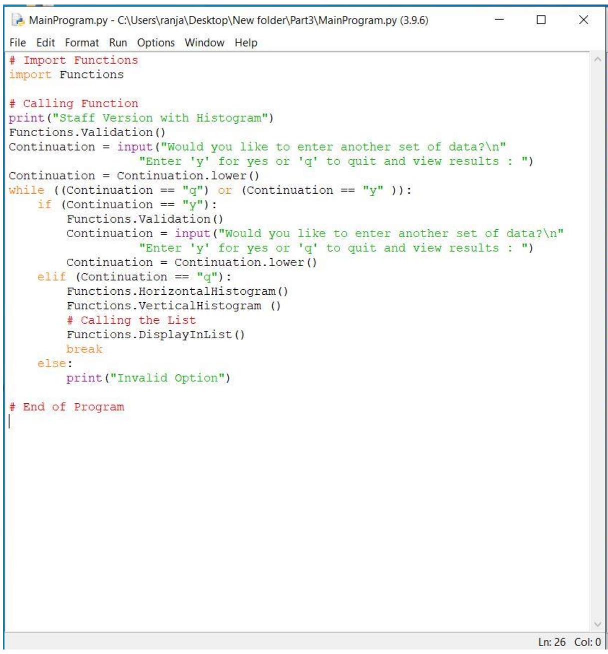
```
# Functions Part

# Import Functions
import Functions

# Calling Function
print("Staff Version with Histogram")
Functions.Validation()
Continuation = input("Would you like to enter another set of data?\n"
                     "Enter 'y' for yes or 'q' to quit and view results : ")
Continuation = Continuation.lower()
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        Functions.Validation()
        Continuation = input("Would you like to enter another set of data?\n"
                     "Enter 'y' for yes or 'q' to quit and view results : ")
        Continuation = Continuation.lower()
    elif (Continuation == "q"):
        Functions.HorizontalHistogram()
        Functions.VerticalHistogram ()
        # Calling the List
        Functions.DisplayInList()
        break
    else:
        print("Invalid Option")


# End of Program
```

Screen Shots

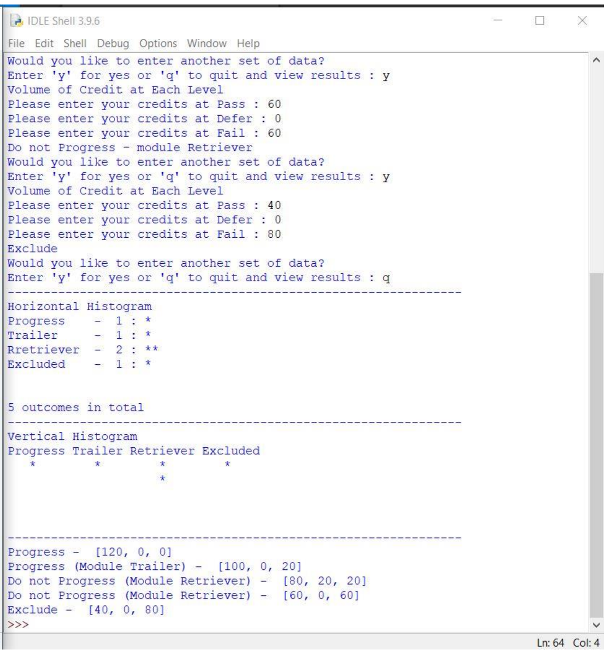

Functions.py - C:\Users\ranja\Desktop\New folder\Part3\Functions.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 183 Col: 43
IDLE Shell 3.9.6
File Edit Shell Debug Options Window Help
Ln: 64 Col: 4

```
            CountExcluded -= 1
        else:
            Row4=(Space*8)
        print(Row1,Row2,Row3,Row4)
        CountTotal = CountTotal - 1


    print("----------------------------------------------------------------")

# Define in the List
def DisplayInList():
    global IndexProgress
    global IndexTrailer
    global IndexRetriever
    global IndexExcluded
    global ProgressList
    global TrailerList
    global RetrieverList
    global ExcludedList
    global CountTotal

# Output the List
    i = 0
    for i in range(len(ProgressList)):
        # Print the List
        print("Progress - ",ProgressList[i])
    i = 0
    for i in range(len(TrailerList)):
        print("Progress (Module Trailer) - ",TrailerList[i])
    i = 0
    for i in range(len(RetrieverList)):
        print("Do not Progress (Module Retriever) - ",RetrieverList[i])
    i = 0
    for i in range(len(ExcludedList)):
        print("Exclude - ",ExcludedList[i])
```

```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AM
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
======== RESTART: C:\Users\ranja\Desktop\New folder\Part3\MainProgram.py =======
Staff Version with Histogram
Volume of Credit at Each Level
Please enter your credits at Pass : 120
Please enter your credits at Defer : 0
Please enter your credits at Fail : 0
Progress
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 100
Please enter your credits at Defer : 0
Please enter your credits at Fail : 20
Progress (Module Trailer)
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 80
Please enter your credits at Defer : 20
Please enter your credits at Fail : 20
Do not Progress - module Retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 60
Please enter your credits at Defer : 0
Please enter your credits at Fail : 60
Do not Progress - module Retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 40
Please enter your credits at Defer : 0
Please enter your credits at Fail : 80
Exclude
Would you like to enter another set of data?
```


MainProgram.py - C:\Users\ranja\Desktop\New folder\Part3\MainProgram.py (3.9.6)
File Edit Format Run Options Window Help
Ln: 26 Col: 0

```
# Import Functions
import Functions

# Calling Function
print("Staff Version with Histogram")
Functions.Validation()
Continuation = input("Would you like to enter another set of data?\n"
                  "Enter 'y' for yes or 'q' to quit and view results : ")
Continuation = Continuation.lower()
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        Functions.Validation()
        Continuation = input("Would you like to enter another set of data?\n"
                  "Enter 'y' for yes or 'q' to quit and view results : ")
        Continuation = Continuation.lower()
    elif (Continuation == "q"):
        Functions.HorizontalHistogram()
        Functions.VerticalHistogram ()
        # Calling the List
        Functions.DisplayInList()
        break
    else:
        print("Invalid Option")

# End of Program
```



```
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 60
Please enter your credits at Defer : 0
Please enter your credits at Fail : 60
Do not Progress - module Retriever
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : y
Volume of Credit at Each Level
Please enter your credits at Pass : 40
Please enter your credits at Defer : 0
Please enter your credits at Fail : 80
Exclude
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : q
---------------------------------------------------------------
Horizontal Histogram
Progress    -  1 : *
Trailer     -  1 : *
Rretriever  -  2 : **
Excluded    -  1 : *


5 outcomes in total
---------------------------------------------------------------
Vertical Histogram
Progress Trailer Retriever Excluded
   *        *        *        *
                     *




---------------------------------------------------------------
Progress -  [120, 0, 0]
Progress (Module Trailer) -  [100, 0, 20]
Do not Progress (Module Retriever) -  [80, 20, 20]
Do not Progress (Module Retriever) -  [60, 0, 60]
Exclude -  [40, 0, 80]
>>>
```

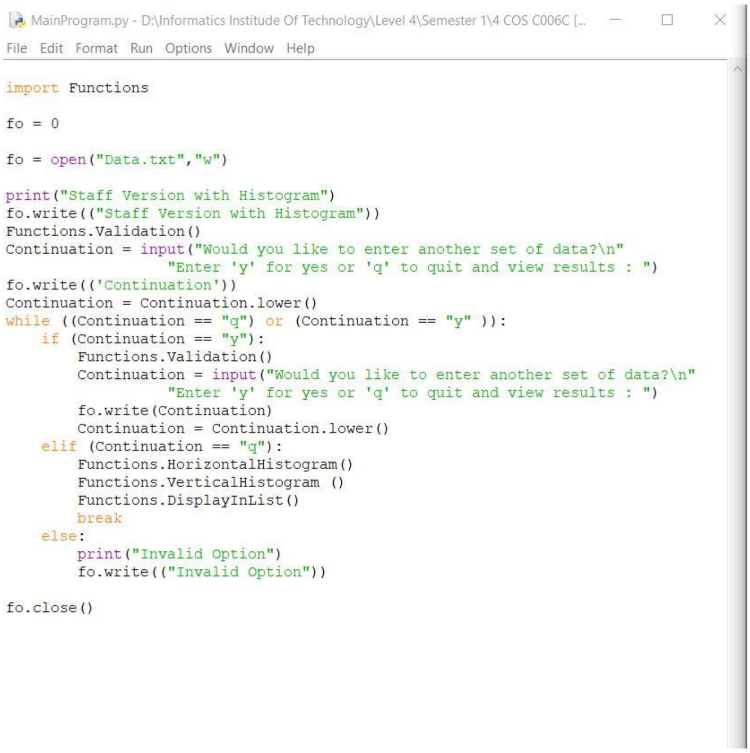
Part 4 - Text File Answers

Python Code

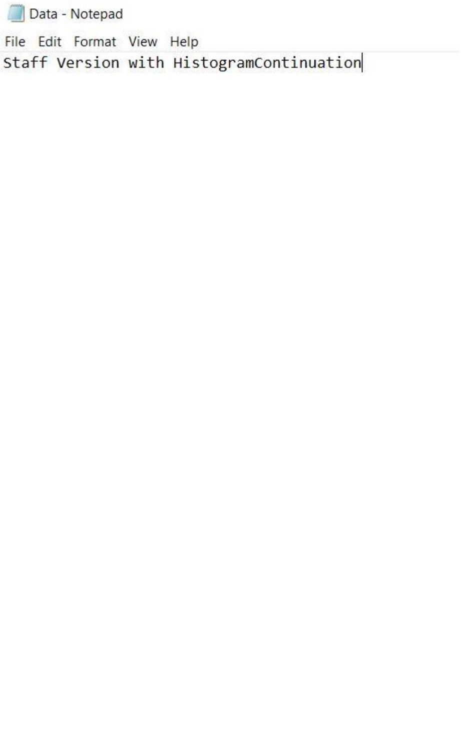
```
# Import Functions
import Functions
# Create Variables
fo = 0
f = 0
# Open File
fo = open("Data.txt","w")

print("Staff Version with Histogram")
# Write on file
fo.write(("Staff Version with Histogram"))
Functions.Validation()
Continuation = input("Would you like to enter another set of data?\n"
                "Enter 'y' for yes or 'q' to quit and view results : ")
fo.write(('Continuation'))
Continuation = Continuation.lower()
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        Functions.Validation()
        Continuation = input("Would you like to enter another set of data?\n"
                "Enter 'y' for yes or 'q' to quit and view results : ")
        fo.write(Continuation)
        Continuation = Continuation.lower()
    elif (Continuation == "q"):
        Functions.HorizontalHistogram()
        Functions.VerticalHistogram ()
        Functions.DisplayInList()
        break
    else:
        print("Invalid Option")
        fo.write(("Invalid Option"))
# Close Files
fo.close()



 # Function Part

# Create Variables
CountTotal = 0
CountProgress = 0
CountTrailer = 0
CountRetriever = 0
CountExcluded = 0
List = []
ProgressList = []
TrailerList = []
RetrieverList = []
ExcludedList = []
```

```
IndexProgress = 0
IndexTrailer = 0
IndexRetriever = 0
IndexExcluded = 0

# Define Validation
def Validation():
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    global List
    global IndexProgress
    global IndexTrailer
    global IndexRetriever
    global IndexExcluded
    global ProgressList
    global TrailerList
    global RetrieverList
    global ExcludedList
    try:
        fo=open("Data.txt","w")
        CountNumber = 0
        print("Volume of Credit at Each Level")
        Pass = int(input("Please enter your credits at Pass : "))
        fo.write("Pass")
        List.insert(CountNumber,Pass)
        while Pass not in range(0,130,20):
            print("Out of Range")
            Pass = int(input("Please enter your credits at Pass : "))
            fo.write("Pass")
            List.insert(CountNumber,Pass)
        else:
            Defer = int(input("Please enter your credits at Defer : "))
            fo.write("Defer")
            CountNumber = CountNumber + 1
            List.insert(CountNumber,Defer)
            while Defer not in range(0,130,20):
                print("Out of Range")
                Defer = int(input("Please enter your credits at Defer : "))
                fo.write("Defer")
                List.insert(CountNumber,Defer)
            else:
                Fail = int(input("Please enter your credits at Fail : "))
                fo.write("Fail")
                CountNumber = CountNumber + 1
                List.insert(CountNumber,Fail)
                while Fail not in range(0,130,20):
                    print("Out of Range")
                    Fail = int(input("Please enter your credits at Fail : "))
                    fo.write("Fail")
                    List.insert(CountNumber,Fail)
                else:
                    if Pass+Defer+Fail == 120 :
                        if (Pass == 120):
                            print("Progress")
                            fo.write("Progress")
                            CountTotal = CountTotal + 1
                            ProgressList.insert(IndexProgress,List)
                            List = []
                            IndexProgress = IndexProgress + 1
                            CountProgress += 1
                        elif (Pass == 100):
                            print("Progress (Module Trailer)")
                            fo.write("Progress (Module Trailer)")
                            CountTotal += 1
                            TrailerList.insert(IndexTrailer,List)
                            List = []
                            IndexTrailer += 1
                            CountTrailer += 1
                        elif Pass<=80 and Pass>=0 and Fail<=60 :
                            print("Do not Progress – module Retriever")
                            fo.write("Do not Progress – module Retriever")
                            CountTotal += 1
                            RetrieverList.insert(IndexRetriever,List)
                            List = []
                            IndexRetriever += 1
                            CountRetriever += 1
                        elif Pass<=40 and Pass>=0 and Defer<=40:
                            print("Exclude")
                            fo.write("Exclude")
                            CountTotal += 1
                            ExcludedList.insert(IndexExcluded,List)
                            List = []
                            IndexExcluded += 1
                            CountExcluded += 1
                    else:
                        print("Total Incorrect")
                        fo.write("Total Incorrect")
    except():
        print("Integer Required")
        fo.write("Integer Required")
    fo.close()



# Horizontal Histogam
def HorizontalHistogram():
    fo=open("Data.txt","w")
    Star="*"
    print("-------------------------------------------------------------")
    fo.write("-------------------------------------------------------------")
    print("Horizontal Histogram")
    fo.write("Horizontal Histogram")
    print("Progress    - ",CountProgress,":",(CountProgress*Star))
    fo.write("'Progress    - ',CountProgress,':',(CountProgress*Star)")
    print("Trailer     - ",CountTrailer,":",(CountTrailer*Star))
    fo.write("'Trailer     - ',CountTrailer,':',(CountTrailer*Star)")
    print("Rretriever  - ",CountRetriever,":",(CountRetriever*Star))
    fo.write("'retriever  - ',CountRetriever,':',(CountRetriever*Star)")
    print("Excluded    - ",CountExcluded,":",(CountExcluded*Star))
    fo.write("'Excluded    - ',CountExcluded,':',(CountExcluded*Star)")
    print()
    fo.write(" ")
    print()
    fo.write(" ")
    print(CountTotal,"outcomes in total")
    fo.write("CountTotal,'outcomes in total'")
    print("------------------------------------------------------------")
    fo.write("------------------------------------------------------------")
    fo.close()

# Vertical Histogram
def VerticalHistogram ():
    fo=open("Data.txt","w")
    global CountTotal
    global CountProgress
    global CountTrailer
    global CountRetriever
    global CountExcluded
    Star="*"
    Space=" "
    Row1=""
    Row2=""
    Row3=""
    Row4=""
    print("Vertical Histogram")
    fo.write("Vertical Histogram")
    print ("Progress","Trailer","Retriever","Excluded")
    fo.write("'Progress','Trailer','Retriever','Excluded'")
    while CountTotal != 0:
        if CountProgress > 0 :
            Row1=(Space*3+"*")
            CountProgress -= 1
        else:
            Row1=(Space*4)
        if CountTrailer > 0:
            Row2=(Space*7+"*")
            CountTrailer -= 1
        else:
            Row2=(Space*8)
        if CountRetriever > 0:
            Row3=(Space*7+"*")
            CountRetriever -= 1
        else:
            Row3=(Space*8)
        if CountExcluded > 0:
            Row4=(Space*7+"*")
            CountExcluded -= 1
        else:
            Row4=(Space*8)
        print(Row1,Row2,Row3,Row4)
        fo.write("Row1,Row2,Row3,Row4")
        CountTotal = CountTotal - 1

    print("--------------------------------------------------------------")
    fo.write("--------------------------------------------------------------")
    fo.close()

# Display in List
def DisplayInList():
    f=open("Data.txt","w")
    global IndexProgress
    global IndexTrailer
    global IndexRetriever
    global IndexExcluded
    global ProgressList
    global TrailerList
    global RetrieverList
    global ExcludedList
    global CountTotal

    i = 0

    for i in range(len(ProgressList)):
        print("Progress - ",ProgressList[i])
        f.write("'Progress - ',ProgressList[i]")
    i = 0
    for i in range(len(TrailerList)):
        print("Progress (Module Trailer) - ",TrailerList[i])
        f.write("'Progress (Module Trailer) - ',TrailerList[i]")
    i = 0
    for i in range(len(RetrieverList)):
        print("Do not Progress (Module Retriever) - ",RetrieverList[i])
        f.write("'Do not Progress (Module Retriever) - ',RetrieverList[i]")
    i = 0
    for i in range(len(ExcludedList)):
        print("Exclude - ",ExcludedList[i])
        f.write("'Exclude - ',ExcludedList[i]")
    f.close()
```

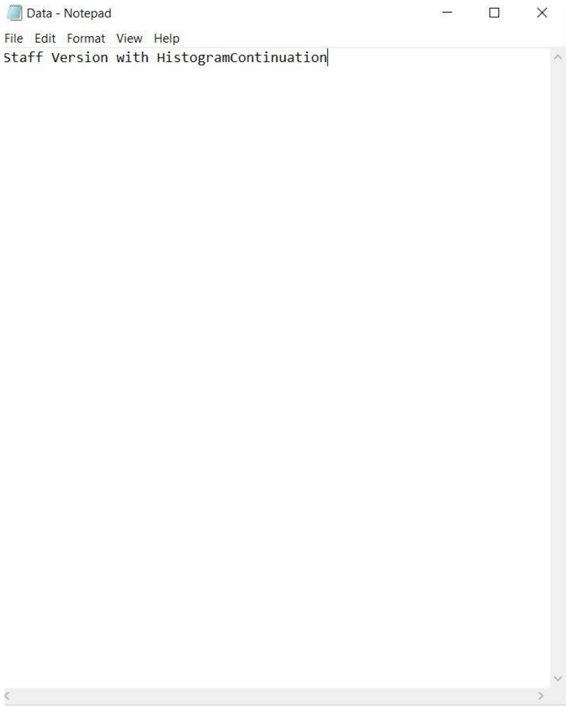
Screen Shots


MainProgram.py - D:\Informatics Institude Of Technology\Level 4\Semester 1\4 COS C006C [...
File Edit Format Run Options Window Help

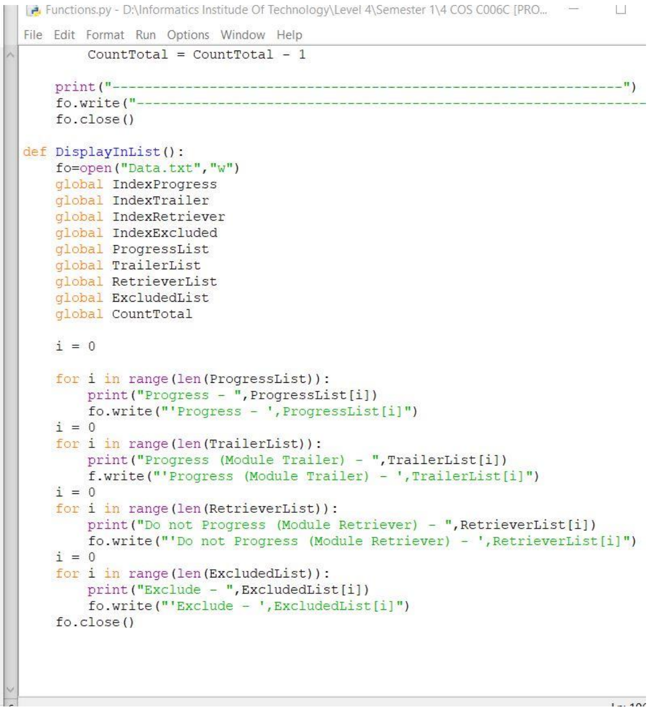
```
import Functions

fo = 0

fo = open("Data.txt","w")

print("Staff Version with Histogram")
fo.write(("Staff Version with Histogram"))
Functions.Validation()
Continuation = input("Would you like to enter another set of data?\n"
                     "Enter 'y' for yes or 'q' to quit and view results : ")
fo.write(('Continuation'))
Continuation = Continuation.lower()
while ((Continuation == "q") or (Continuation == "y" )):
    if (Continuation == "y"):
        Functions.Validation()
        Continuation = input("Would you like to enter another set of data?\n"
                     "Enter 'y' for yes or 'q' to quit and view results : ")
        fo.write(Continuation)
        Continuation = Continuation.lower()
    elif (Continuation == "q"):
        Functions.HorizontalHistogram()
        Functions.VerticalHistogram ()
        Functions.DisplayInList()
        break
    else:
        print("Invalid Option")
        fo.write(("Invalid Option"))

fo.close()
```



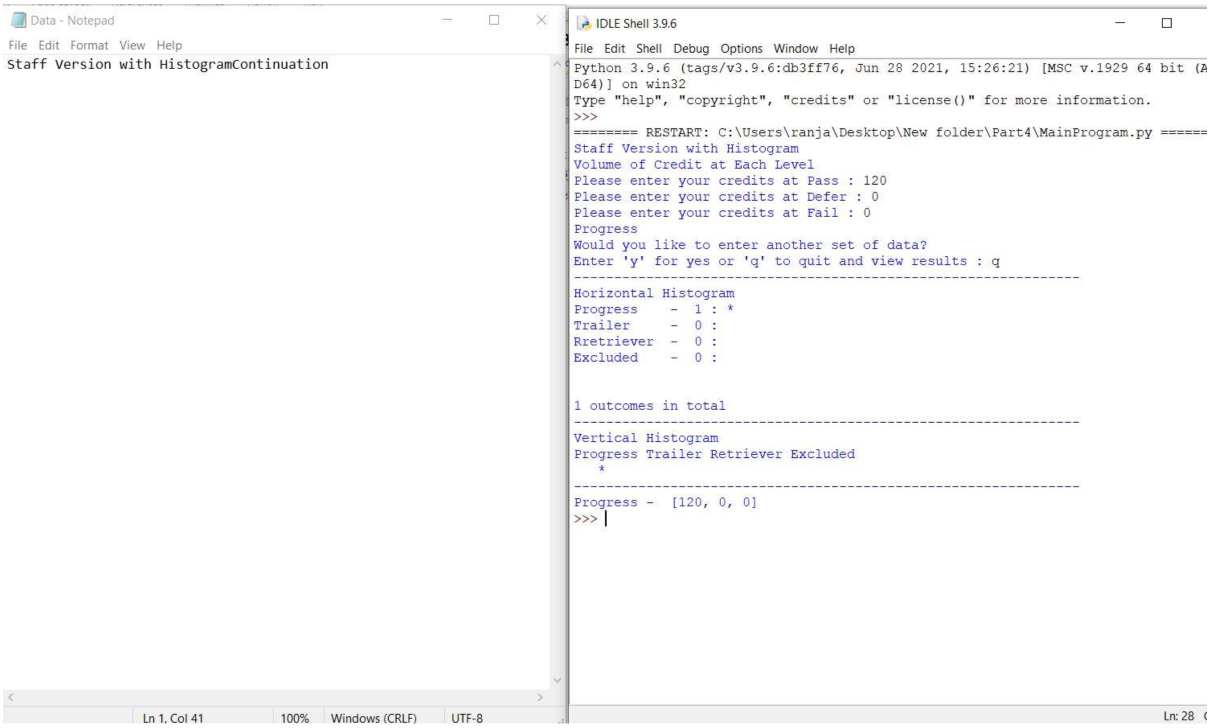
```
Staff Version with HistogramContinuation
```



```
Staff Version with HistogramContinuation
```


Functions.py - D:\Informatics Institude Of Technology\Level 4\Semester 1\4 COS C006C [PRO...
File Edit Format Run Options Window Help

```
        CountTotal = CountTotal - 1

    print("---------------------------------------------------------------")
    fo.write("---------------------------------------------------------------
    fo.close()

def DisplayInList():
    fo=open("Data.txt","w")
    global IndexProgress
    global IndexTrailer
    global IndexRetriever
    global IndexExcluded
    global ProgressList
    global TrailerList
    global RetrieverList
    global ExcludedList
    global CountTotal

    i = 0

    for i in range(len(ProgressList)):
        print("Progress - ",ProgressList[i])
        fo.write("'Progress - ',ProgressList[i]")
    i = 0
    for i in range(len(TrailerList)):
        print("Progress (Module Trailer) - ",TrailerList[i])
        f.write("'Progress (Module Trailer) - ',TrailerList[i]")
    i = 0
    for i in range(len(RetrieverList)):
        print("Do not Progress (Module Retriever) - ",RetrieverList[i])
        fo.write("'Do not Progress (Module Retriever) - ',RetrieverList[i]")
    i = 0
    for i in range(len(ExcludedList)):
        print("Exclude - ",ExcludedList[i])
        fo.write("'Exclude - ',ExcludedList[i]")
    fo.close()
```



```
Staff Version with HistogramContinuation
```

```
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (A
D64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
======== RESTART: C:\Users\ranja\Desktop\New folder\Part4\MainProgram.py ======
Staff Version with Histogram
Volume of Credit at Each Level
Please enter your credits at Pass : 120
Please enter your credits at Defer : 0
Please enter your credits at Fail : 0
Progress
Would you like to enter another set of data?
Enter 'y' for yes or 'q' to quit and view results : q
---------------------------------------------------------------
Horizontal Histogram
Progress    -  1 : *
Trailer     -  0 :
Rretriever  -  0 :
Excluded    -  0 :


1 outcomes in total
---------------------------------------------------------------
Vertical Histogram
Progress Trailer Retriever Excluded
   *
---------------------------------------------------------------
Progress -  [120, 0, 0]
>>> 
```

TEST PLAN for **Part 2, 3 and 4**

TEST PLAN for **Part 2, 3 and 4**			**Actual Result (or state ‘not attempted’)**	**Pass/Fail**
17	**Vertical Histogram**	**Progress 1 | Trailer 2 | Retriever 4 | Exclude 1** * * * * * * * * **8 outcomes in total.**	Progress 1 | Trailer 2 | Retriever 4 | Exclude 1 * * * * * * * * 8 outcomes in total.	Pass
18	**Solution uses list, tuple or dictionary**	**Output uses data stored to and retrieved from list, tuple or dictionary**	Output uses data stored to and retrieved from list, tuple or dictionary	Pass
19	**Solution uses text file**	**Output uses data stored to and retrieved from text file**	Attempted	Fail