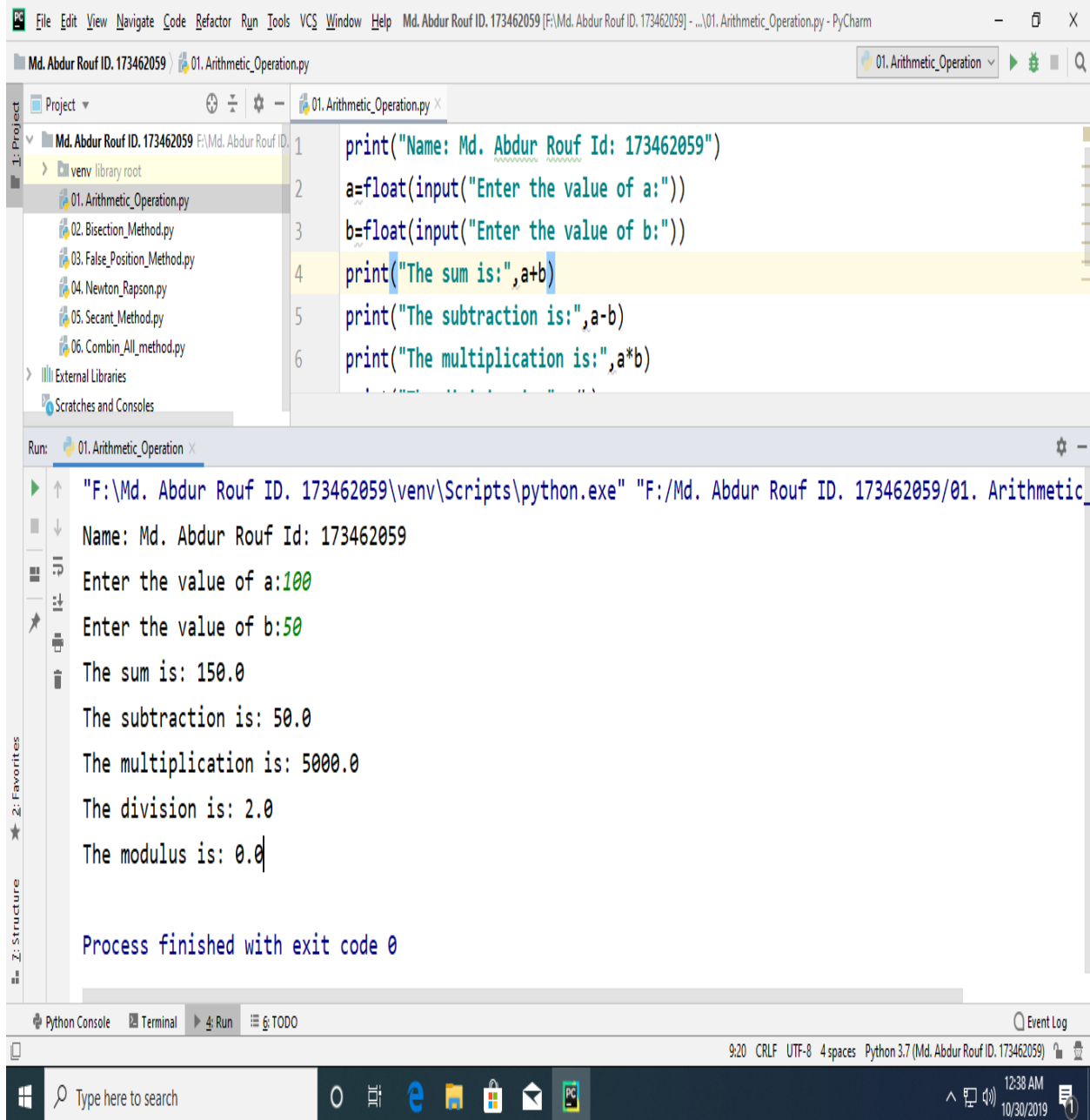


## Output:



The screenshot displays the PyCharm IDE interface. The top toolbar includes icons for File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, and Help. The main editor window shows the file `01.Arithmetic_Operation.py` with the following Python code:

```
1 print("Name: Md. Abdur Rouf Id: 173462059")
2 a=float(input("Enter the value of a:"))
3 b=float(input("Enter the value of b:"))
4 print("The sum is:",a+b)
5 print("The subtraction is:",a-b)
6 print("The multiplication is:",a*b)
```

The left sidebar shows the project structure with a folder named `Md. Abdur Rouf ID. 173462059` containing several Python files, including `01.Arithmetic_Operation.py`, `02.Bisection_Method.py`, `03.False_Position_Method.py`, `04.Newton_Rapson.py`, `05.Secant_Method.py`, and `06.Combin_All_method.py`.

The bottom pane shows the Run output for `01.Arithmetic_Operation`. The command executed is `"F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:\Md. Abdur Rouf ID. 173462059\01.Arithmetic_Operation.py"`. The output shows the program's execution with user input:

```
Name: Md. Abdur Rouf Id: 173462059
Enter the value of a:100
Enter the value of b:50
The sum is: 150.0
The subtraction is: 50.0
The multiplication is: 5000.0
The division is: 2.0
The modulus is: 0.0

Process finished with exit code 0
```

The bottom status bar indicates the current time is 9:20, the encoding is CRLF, the file is in UTF-8, and the Python version is 3.7 (Md. Abdur Rouf ID. 173462059).

Figure: Implementation of Output All Arithmetic Operation in Python

## Output:

The screenshot displays the PyCharm IDE interface. The top toolbar includes menus like File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, and Help. The project name is 'Md. Abdur Rouf ID. 173462059'. The left sidebar shows the project structure with files: 01.Arithmetic\_Operation.py, 02.Bisection\_Method.py, 03.False\_Position\_Method.py, 04.Newton\_Rapson.py, 05.Secant\_Method.py, and 06.Combin\_All\_method.py. The main editor window shows the code for 02.Bisection\_Method.py:

```
1 print("Name: Md. Abdur Rouf Id: 173462059")
2 def f(x):
3     return x*x-2*x-3
4 def bisection(a,b):
5     if(f(a)*f(b)>=0):
6         print("No root ")
```

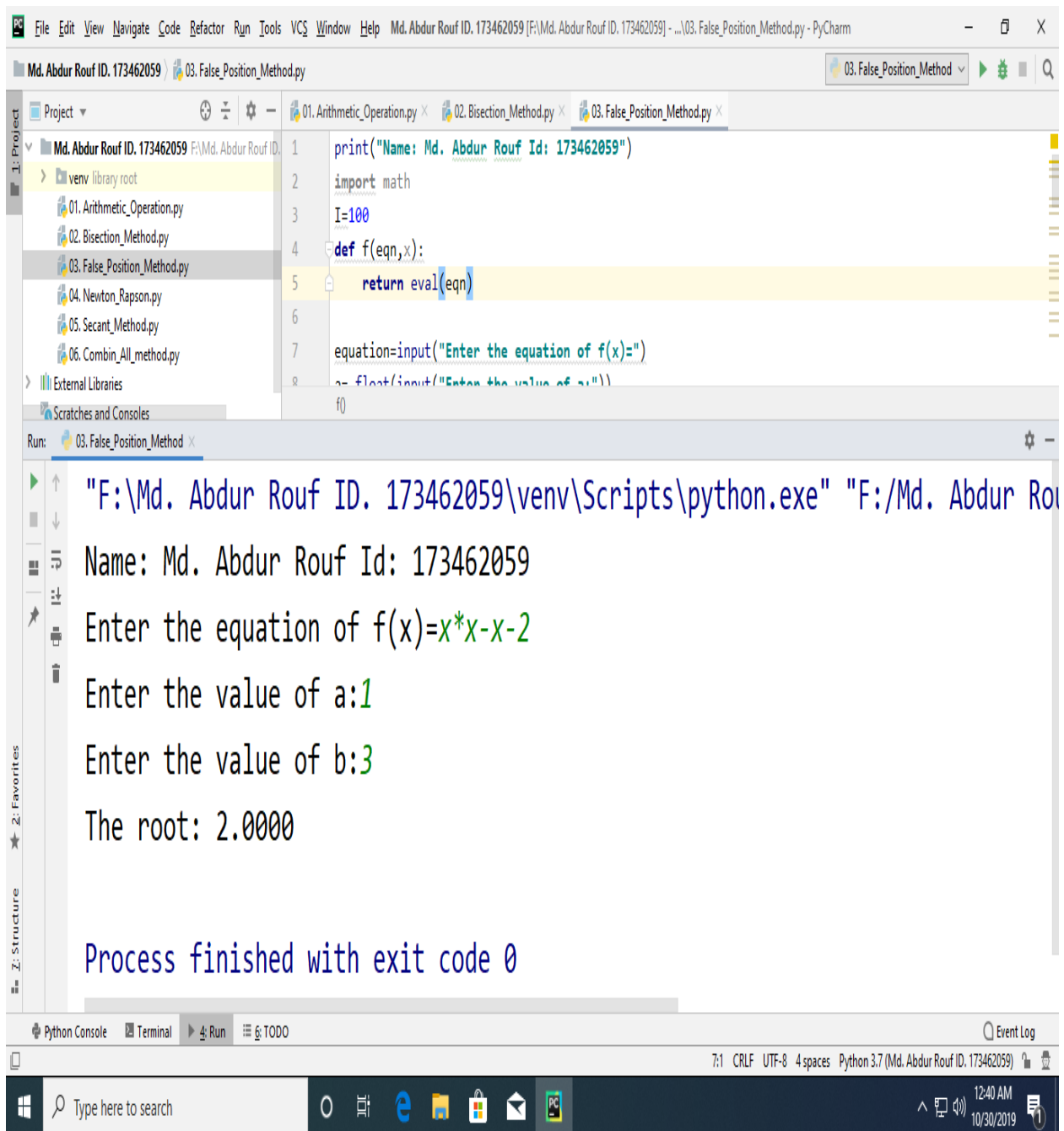
The Run window at the bottom shows the output of the program:

```
"F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:/Md. Abdur Rouf ID. 173462059/02.Bisection_Method.py"
Name: Md. Abdur Rouf Id: 173462059
The root is: 3.0031
Process finished with exit code 0
```

The bottom status bar indicates the file encoding is UTF-8, the Python version is 3.7, and the current time is 12:39 AM on 10/30/2019.

Figure: Implementation of Output Bisection Method in Python

## Output:



```
File Edit View Navigate Code Refactor Run Tools VCS Window Help Md. Abdur Rouf ID. 173462059 [F:\Md. Abdur Rouf ID. 173462059] - ...03.False_Position_Method.py - PyCharm

Md. Abdur Rouf ID. 173462059 03.False_Position_Method.py

Project
  Md. Abdur Rouf ID. 173462059 F:\Md. Abdur Rouf ID.
    venv library root
    01.Arithmetic_Operation.py
    02.Bisection_Method.py
    03.False_Position_Method.py
    04.Newton_Rapson.py
    05.Secant_Method.py
    06.Combine_All_method.py
  External Libraries
  Scratches and Consoles

Run: 03.False_Position_Method
  "F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:/Md. Abdur Rouf ID. 173462059/03.False_Position_Method.py"
  Name: Md. Abdur Rouf Id: 173462059
  Enter the equation of f(x)=x*x-x-2
  Enter the value of a:1
  Enter the value of b:3
  The root: 2.0000
  Process finished with exit code 0

Python Console Terminal Run TODO Event Log
7:1 CRLF UTF-8 4 spaces Python 3.7 (Md. Abdur Rouf ID. 173462059) 12:40 AM 10/30/2019
```

Figure: Implementation of Output False-Position Method in Python

## Output:

```
File Edit View Navigate Code Refactor Run Tools VCS Window Help Md. Abdur Rouf ID. 173462059 [F:\Md. Abdur Rouf ID. 173462059] - ...\\04. Newton_Rapson.py - PyCharm
Md. Abdur Rouf ID. 173462059 04. Newton_Rapson.py
Project
  Md. Abdur Rouf ID. 173462059
    venv library root
    01. Arithmetic_Operation.py
    02. Bisection_Method.py
    03. False_Position_Method.py
    04. Newton_Rapson.py
    05. Secant_Method.py
    06. Combin_All_method.py
  External Libraries
Scratches and Consoles
Run: 04. Newton_Rapson
  "F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:/Md. Abdur
  Name: Md. Abdur Rouf Id: 173462059
  Enter the f(x)=x*x*x-6*x+4
  Enter the value of a:.8
  df(x)=3*x*x-6
  The root = 0.7321
  Process finished with exit code 0
Python Console Terminal Run TODO
PEP 8: expected 2 blank lines after class or function definition, found 0 7:1 CRLF UTF-8 4 spaces Python 3.7 (Md. Abdur Rouf ID. 173462059) 12:42 AM 10/30/2019
```

Figure: Implementation of Output Newton Raphson Method in Python

## Output:

The screenshot displays the PyCharm IDE interface. The top toolbar includes menus like File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, and Help. The project explorer on the left shows a project named 'Md. Abdur Rouf ID. 173462059' with a 'venv' directory and several Python files, including '05. Secant\_Method.py'. The main editor window shows the code for '05. Secant\_Method.py':

```
print("Name: Md. Abdur Rouf Id: 173462059")
import math
def f(e,x):
    return eval(e)
F=input("f(x)=")
x1=float(input("Enter the value of x1="))
```

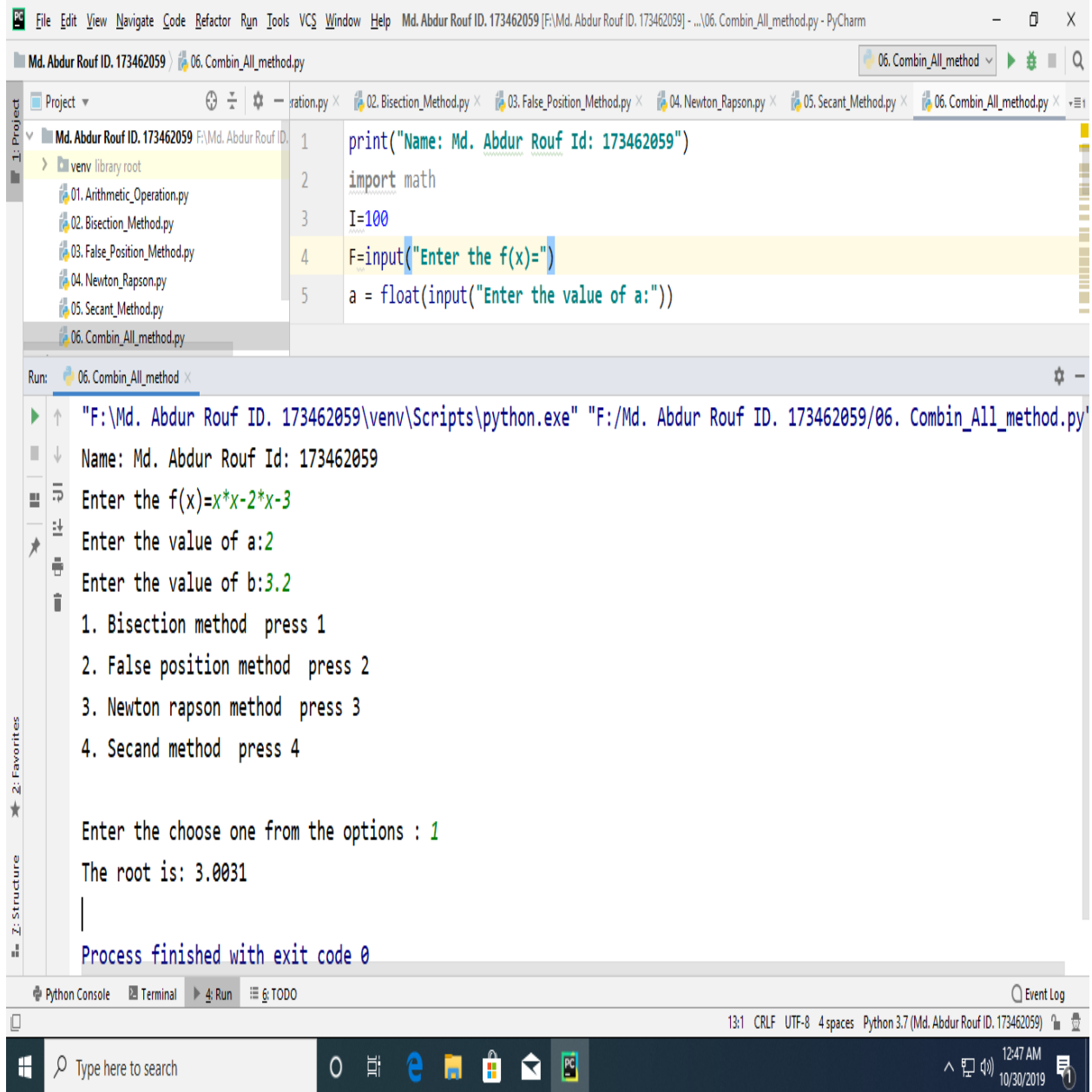
Below the editor, the 'Run' console shows the output of the program:

```
"F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:/Md. Abdur Rouf ID. 173462059/05. Secant_Method.py"
Name: Md. Abdur Rouf Id: 173462059
f(x)=x*x-4*x-10
Enter the value of x1=4
Enter the value of x2=2
The root : 5.7417
Process finished with exit code 0
```

The bottom status bar indicates the Python version is 3.7 and the file encoding is UTF-8. The Windows taskbar at the bottom shows the system clock as 12:43 AM on 10/30/2019.

Figure: Implementation of Output Secant Method in Python

## Output:



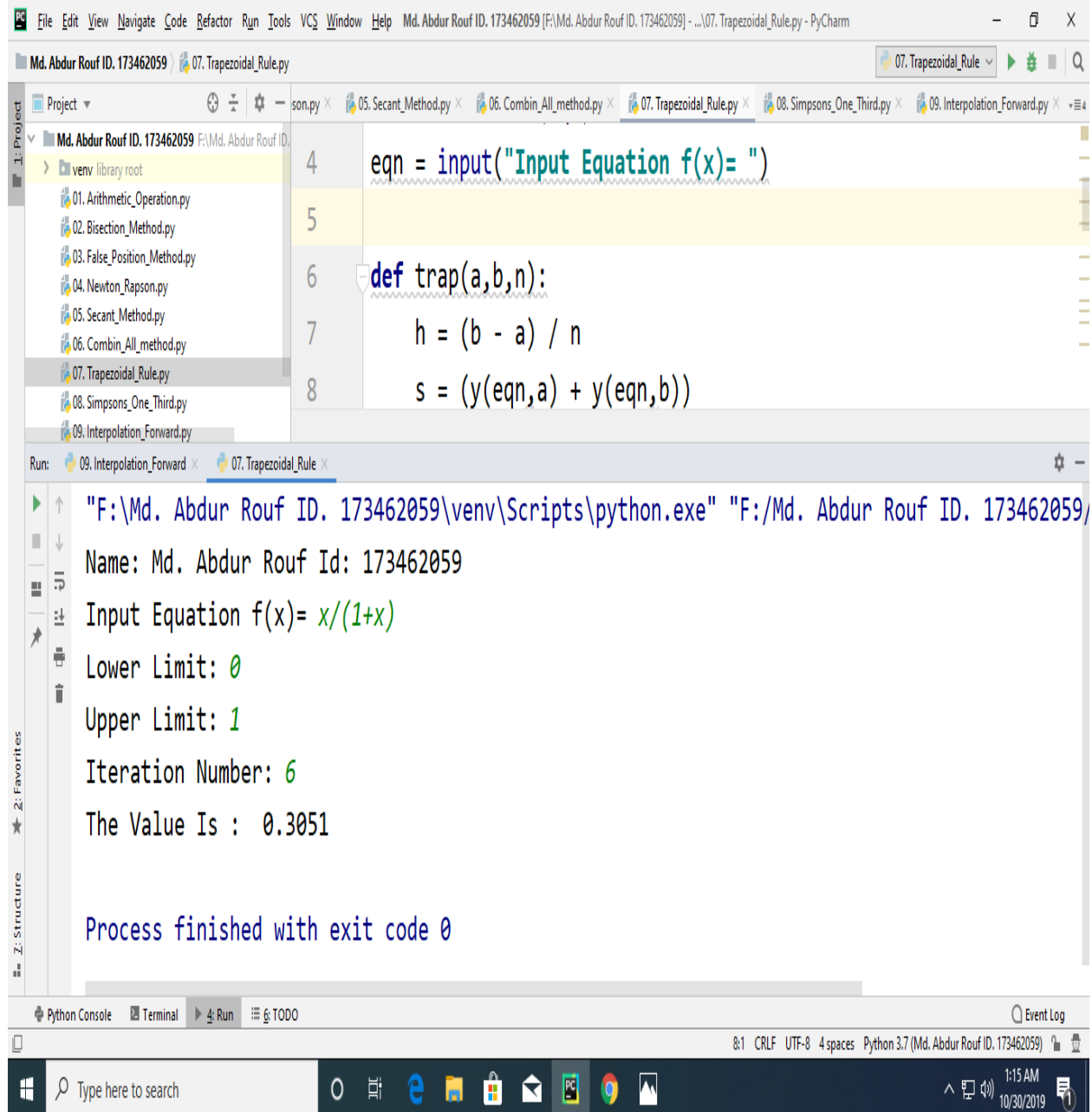
```
File Edit View Navigate Code Refactor Run Tools VCS Window Help Md. Abdur Rouf ID. 173462059 [F:\Md. Abdur Rouf ID. 173462059] - ...\\06. Combin_All_method.py - PyCharm
Md. Abdur Rouf ID. 173462059 06. Combin_All_method.py 06. Combin_All_method
Project 01.Arithmetic_Operation.py 02. Bisection_Method.py 03. False_Position_Method.py 04. Newton_Rapson.py 05. Secant_Method.py 06. Combin_All_method.py
1 print("Name: Md. Abdur Rouf Id: 173462059")
2 import math
3 I=100
4 F=input("Enter the f(x)=")
5 a = float(input("Enter the value of a:"))

Run: 06. Combin_All_method
"F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:/Md. Abdur Rouf ID. 173462059/06. Combin_All_method.py"
Name: Md. Abdur Rouf Id: 173462059
Enter the f(x)=x*x-2*x-3
Enter the value of a:2
Enter the value of b:3.2
1. Bisection method press 1
2. False position method press 2
3. Newton rapson method press 3
4. Secand method press 4

Enter the choose one from the options : 1
The root is: 3.0031
Process finished with exit code 0
```

Figure: Implementation of Output Different Methods to Find the Root of a Nonlinear Equation in Python

## Output:



```
File Edit View Navigate Code Refactor Run Tools VCS Window Help Md. Abdur Rouf ID. 173462059 [F:\Md. Abdur Rouf ID. 173462059] - ...07. Trapezoidal_Rule.py - PyCharm

Md. Abdur Rouf ID. 173462059 07. Trapezoidal_Rule.py

Project
Md. Abdur Rouf ID. 173462059 F:\Md. Abdur Rouf ID. 173462059
venv library root
01. Arithmetic_Operation.py
02. Bisection_Method.py
03. False_Position_Method.py
04. Newton_Rapson.py
05. Secant_Method.py
06. Combin_All_method.py
07. Trapezoidal_Rule.py
08. Simpsons_One_Third.py
09. Interpolation_Forward.py

4 eqn = input("Input Equation f(x)= ")
5
6 def trap(a,b,n):
7     h = (b - a) / n
8     s = (y(eqn,a) + y(eqn,b))

Run: 09. Interpolation_Forward 07. Trapezoidal_Rule

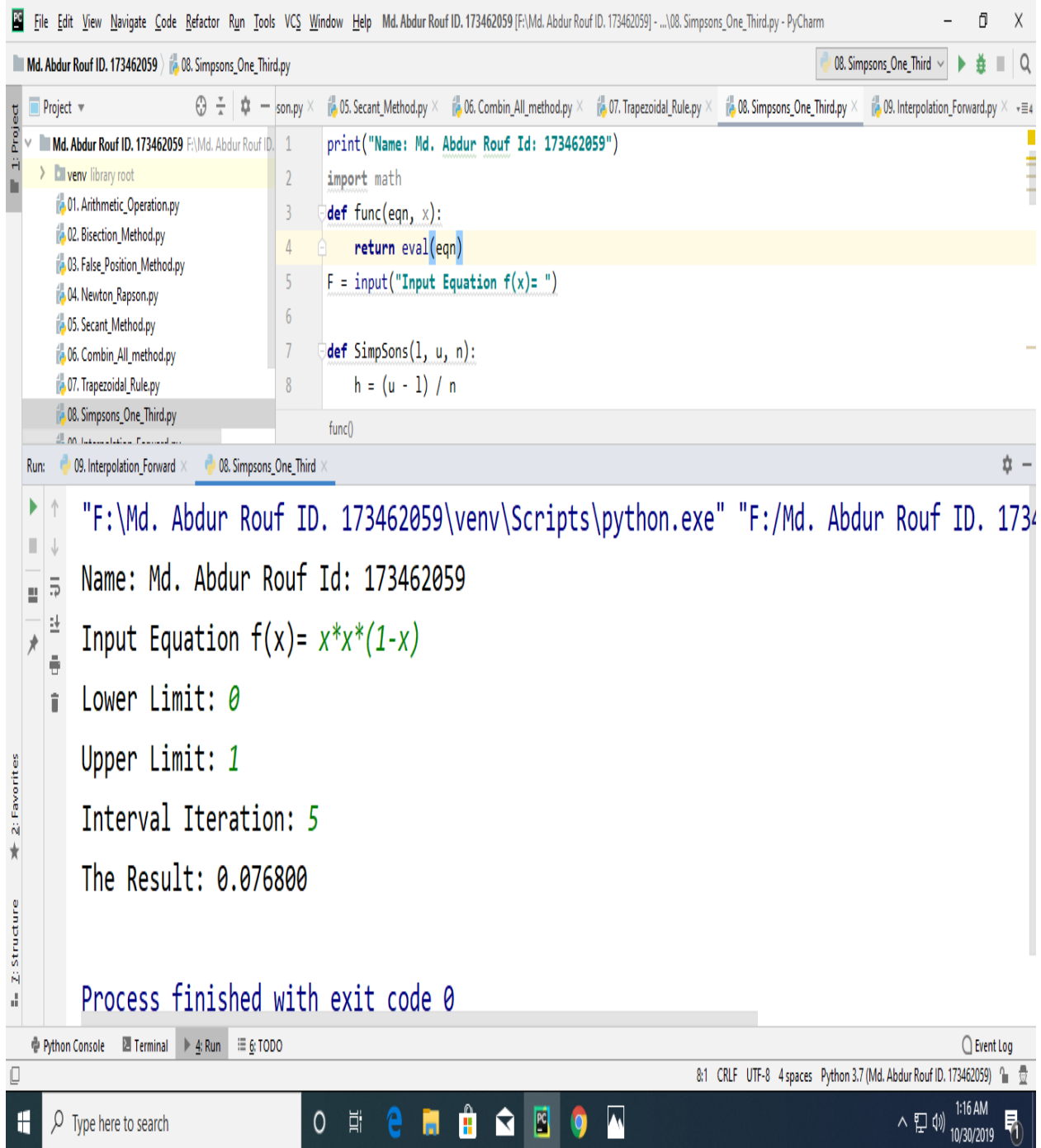
"F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:/Md. Abdur Rouf ID. 173462059/
Name: Md. Abdur Rouf Id: 173462059
Input Equation f(x)= x/(1+x)
Lower Limit: 0
Upper Limit: 1
Iteration Number: 6
The Value Is : 0.3051

Process finished with exit code 0

Python Console Terminal Run TODO
8:1 CRLF UTF-8 4 spaces Python 3.7 (Md. Abdur Rouf ID. 173462059)
Type here to search 1:15 AM 10/30/2019
```

Figure: Implementation of Output Trapezoidal Rule in Python

## Output:



```
File Edit View Navigate Code Refactor Run Tools VCS Window Help Md. Abdur Rouf ID. 173462059 [F:\Md. Abdur Rouf ID. 173462059] - ...08. Simpsons_One_Third.py - PyCharm

Md. Abdur Rouf ID. 173462059 08. Simpsons_One_Third.py

Project
Md. Abdur Rouf ID. 173462059
  venv library root
  01. Arithmetic_Operation.py
  02. Bisection_Method.py
  03. False_Position_Method.py
  04. Newton_Rapson.py
  05. Secant_Method.py
  06. Combin_All_method.py
  07. Trapezoidal_Rule.py
  08. Simpsons_One_Third.py
  09. Interpolation_Forward.py

1 print("Name: Md. Abdur Rouf Id: 173462059")
2 import math
3 def func(eqn, x):
4     return eval(eqn)
5 F = input("Input Equation f(x)= ")
6
7 def SimpSons(l, u, n):
8     h = (u - l) / n
9     func()

Run: 09. Interpolation_Forward 08. Simpsons_One_Third
"F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:\Md. Abdur Rouf ID. 173462059\08. Simpsons_One_Third.py"
Name: Md. Abdur Rouf Id: 173462059
Input Equation f(x)= x*x*(1-x)
Lower Limit: 0
Upper Limit: 1
Interval Iteration: 5
The Result: 0.076800

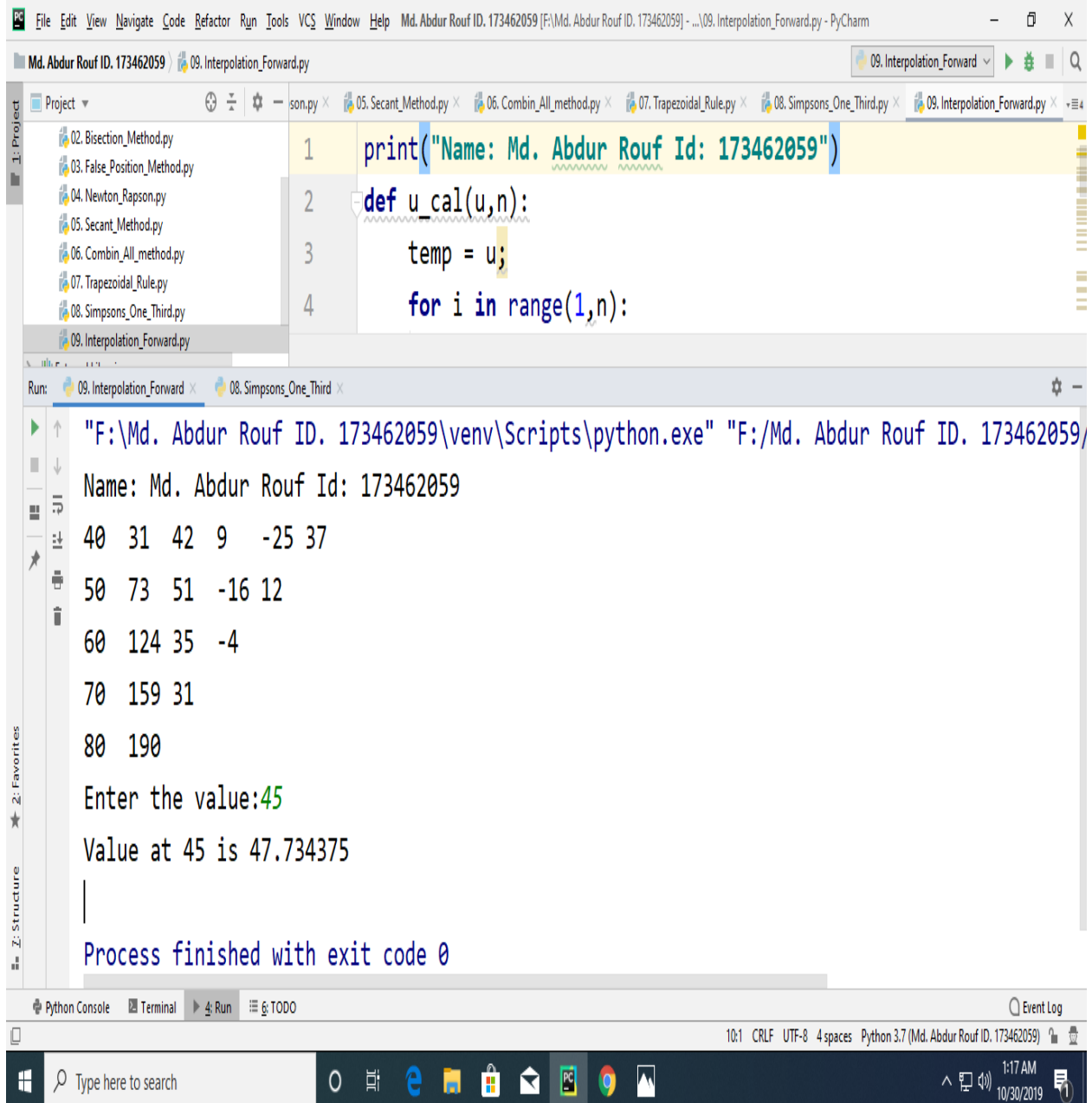
Process finished with exit code 0

Python Console Terminal Run TODO
8:1 CRLF UTF-8 4 spaces Python 3.7 (Md. Abdur Rouf ID. 173462059)
Type here to search 1:16 AM 10/30/2019
```

Figure: Implementation of Output Simpsons One-Third Rule in Python



## Output:



```
File Edit View Navigate Code Refactor Run Tools VCS Window Help Md. Abdur Rouf ID. 173462059 [F:\Md. Abdur Rouf ID. 173462059] - ... \09. Interpolation_Forward.py - PyCharm
Md. Abdur Rouf ID. 173462059 09. Interpolation_Forward.py 09. Interpolation_Forward
Project 02. Bisection_Method.py 03. False_Position_Method.py 04. Newton_Rapson.py 05. Secant_Method.py 06. Combin_All_method.py 07. Trapezoidal_Rule.py 08. Simpsons_One_Third.py 09. Interpolation_Forward.py
1 print("Name: Md. Abdur Rouf Id: 173462059")
2 def u_cal(u,n):
3     temp = u;
4     for i in range(1,n):
5         temp = temp * (u - x[i]) / (x[i] - x[0])
6         temp = temp * (u - x[i+1]) / (x[i+1] - x[0])
7     return temp
8
9 if __name__ == '__main__':
10     x = [40, 50, 60, 70, 80]
11     y = [31, 73, 124, 159, 190]
12     u = 45
13     n = len(x)
14     result = u_cal(u,n)
15     print('Value at', u, 'is', result)
16
Run: 09. Interpolation_Forward 08. Simpsons_One_Third
"F:\Md. Abdur Rouf ID. 173462059\venv\Scripts\python.exe" "F:/Md. Abdur Rouf ID. 173462059/
Name: Md. Abdur Rouf Id: 173462059
40 31 42 9 -25 37
50 73 51 -16 12
60 124 35 -4
70 159 31
80 190
Enter the value:45
Value at 45 is 47.734375
Process finished with exit code 0
Python Console Terminal Run TODO Event Log
10:1 CRLF UTF-8 4 spaces Python 3.7 (Md. Abdur Rouf ID. 173462059) 1:17 AM 10/30/2019
```

Figure: Implementation of Output Newton's Interpolation forward in Python

