SOFTWARE ENGINEERING

LAB TASK - 1

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1. **Implement Weather Modeling* using the quadratic solution in stages: hard-coding variables keyboard input, read from a file, for a single set of input, multiple sets of inputs**

CODE:

History - main.py × weather.txt +

main.py

```python
def temperature_modeling(a, b, c, time):
    # Calculate temperature based on time using the quadratic equation
    temperature = a * time**2 + b * time + c
    return temperature

# Function to read coefficients and times from file
def read_coefficients_from_file(filename):
    coefficients = []
    with open(filename, 'r') as file:
        lines = file.readlines()
        for line in lines:
            if line.strip():  # Check if line is not empty
                a, b, c, time = map(float, line.split())
                coefficients.append((a, b, c, time))
    return coefficients

# Hard-coded coefficients
a_hardcoded, b_hardcoded, c_hardcoded = 0.1, 2, 10
time_hardcoded = 5  # Example time value

# Display results for hard-coded coefficients
print("Hard-coded Variables for Weather Modeling")
print("Temperature for hardcoded coefficients at time", time_hardcoded,
"hours:", temperature_modeling(a_hardcoded, b_hardcoded, c_hardcoded,
time_hardcoded))
```

History - main.py | weather.txt

main.py

```
    temperature_modeling(a_hardcoded, b_hardcoded, c_hardcoded, time_hardcoded))
24  print("\n")
25
26  # Keyboard input coefficients
27  print("Keyboard Input for Weather Modeling")
28  a_keyboard = float(input("Enter coefficient a: "))
29  b_keyboard = float(input("Enter coefficient b: "))
30  c_keyboard = float(input("Enter coefficient c: "))
31  time_keyboard = float(input("Enter time in hours: "))
32
33  # Display results for keyboard input coefficients
34  print("Temperature for keyboard input coefficients at time", time_keyboard, "hours:",
    temperature_modeling(a_keyboard, b_keyboard, c_keyboard, time_keyboard))
35  print("\n")
36
37  # Read coefficients from file
38  print("Read from a File for Weather Modeling")
39  filename = 'weather.txt'
40  coefficients_from_file = read_coefficients_from_file(filename)
41
42  # Display results for coefficients from file
43  for idx, (a_file, b_file, c_file, time_file) in enumerate(coefficients_from_file):
44      print(f"Set {idx + 1}:")
45      print(f"Temperature for file input coefficients at time {time_file} hours:",
    temperature_modeling(a_file, b_file, c_file, time_file))
46      print()
47
```

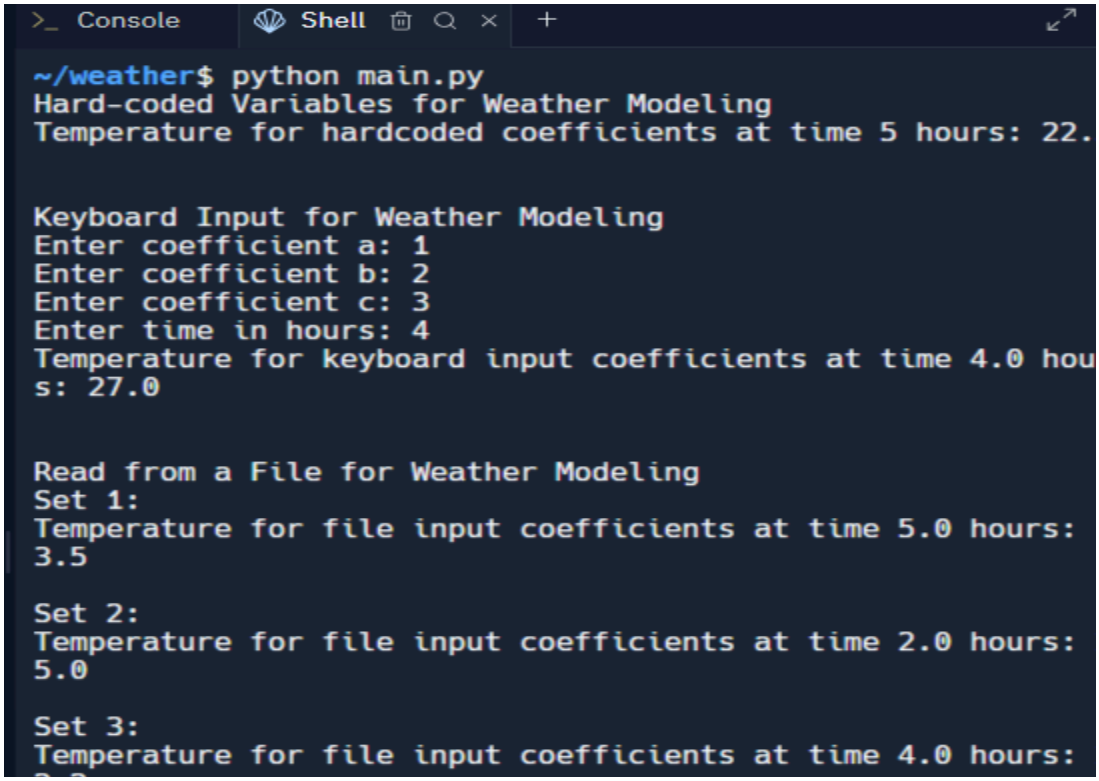
Textfile:

History - main.py | weather.txt

weather.txt

```
1   0.1 2.0 1.0 5.0
2   5.0 1.0 3.0 2.0
3   0.2 3.5 5.0 4.0
```

Output:


Console
Shell
~/weather$ python main.py
Hard-coded Variables for Weather Modeling
Temperature for hardcoded coefficients at time 5 hours: 22.
Keyboard Input for Weather Modeling
Enter coefficient a: 1
Enter coefficient b: 2
Enter coefficient c: 3
Enter time in hours: 4
Temperature for keyboard input coefficients at time 4.0 hou
s: 27.0
Read from a File for Weather Modeling
Set 1:
Temperature for file input coefficients at time 5.0 hours:
3.5
Set 2:
Temperature for file input coefficients at time 2.0 hours:
5.0
Set 3:
Temperature for file input coefficients at time 4.0 hours: