System Requirements Specification Index

For

Python Basics and NumPy, Pandas

Usecase 2

1.0

IHT Pvt. Ltd.

Use Case1: Inventory Management (inventory_management.py)

The dataset provided to you

```
# Dataset: Inventory (Item, Quantity) and Prices
inventory_data = [
    ("Laptop", 5),
    ("Mouse", 20),
    ("Keyboard", 12),
    ("Monitor", 3),
    ("USB Drive", 50)
]

item_prices = {
    "Laptop": 1000,
    "Mouse": 25,
    "Keyboard": 80,
    "Monitor": 300,
    "USB Drive": 15
}
```

1) Write a Python program to check and return low-stock items.

- Define a function get_low_stock_items(inventory, reorder_level).
- The function should:
    - Loop through the inventory dataset.
    - Identify items with stock below the reorder level.
    - Return a list of such low-stock items.

2) Write a Python program to calculate the total inventory value.

- Define a function calculate_inventory_value(inventory, prices).
- The function should:
    - Multiply each item's stock by its price.
    - Sum up the total inventory value.
    - Return the total inventory value.

Use Case:2 Weather Analysis (weather_analysis.py)

Dataset temperatures = {32.5, 34.0, 31.2, 29.8, 35.5}

1) Write a Python program to analyze weather data.

- Define a function weather_analysis(temperatures).
- The function should:
    - Identify the highest and lowest temperatures.
    - Detect extreme temperatures (above 34°C or below 30°C).
    - Generate and return a formatted weather analysis report.

2) Write a Python program to save the weather analysis report to a file.

- Define a function save_report_to_file(report, filename).
- The function should: weather_analysis()
    - Append the generated weather report to a text file.
    - Display a confirmation message when the report is saved.
    - Use a sample dataset of temperature readings in Celsius.

    - Detect the Highest Temperature and low temperature

- Save the generated report using save_report_to_file()

Use Case3: Customer Purchase Analysis (customer_purchase_analysis.py)

Customer purchase dataset provided

```
data = {
    'Customer': ['Alice', 'Bob', 'Charlie', 'Diana', 'Eve'],
    'Items_Bought': [3, 7, 5, 2, 9],
    'Amount_Spent': [150.0, 400.0, 275.0, 100.0, 600.0]
}
```

1) Write a Python program to create and display a customer purchase dataset using Pandas.

- Define a function create_dataframe().
- The function should:
    - Create a Pandas DataFrame containing customer purchase details.
    - Include the following columns: Customer, Items_Bought, Amount_Spent.
    - Return the DataFrame.

2) Write a Python program to calculate the average amount spent by customers.

- Define a function calculate_average_spending(df).
- The function should:
    - Compute the average amount spent across all customers.
    - Return the calculated average.

3) Write a Python program to identify high-spending customers.

- Define a function get_top_spenders(df, average_spending).
- The function should:
    - Filter and return a DataFrame of customers whose spending is above the average.

4) Write a Python program to analyze and display the customer purchase data.

- Implement a main() function that:
    - Calls create_dataframe() to generate the dataset.
    - Calls calculate_average_spending(df) to compute the average spending.
    - Calls get_top_spenders(df, average_spending) to identify high-spending customers.
    - Prints the customer purchase dataset and high-spending customers.

Execution Steps to Follow:

1. All actions like build, compile, running application,running test cases will bethrough Command Terminal.

2. To open the command terminal the test takers, need to go to Application menu(Three horizontal lines at left top) -> Terminal -> New Terminal

3. This editor Auto Saves the code

4. If you want to exit(logout) and continue the coding later anytime (using Save & Exit option on Assessment Landing Page) then you need to use **CTRL+Shift+B** -command compulsorily on code IDE. This will push or save the updated contents in the internal git/repository. Else the code will not be available in the next login.

5. These are time bound assessments the timer would stop if you logout and whilelogging in back using the same credentials the timer would resume from the sametime it was stopped from the previous logout.

6. To setup environment:

You can run the application without importing any packages

7. To launch application:

python3 customer_purchase_analysis.py

python3 inventory_management.py.py

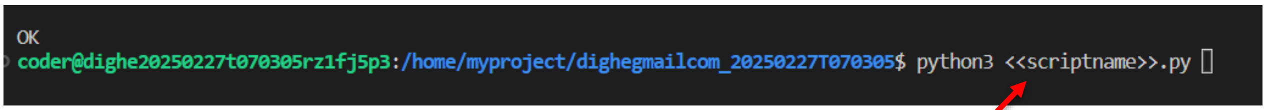
python3 weather_analysis.py

To run Test cases:

python3 -m unittest

8. You need to use **CTRL+Shift+B** - command compulsorily on code IDE, before final submission as well. This will push or save the updated contents in the internal git/repository, and will be used to evaluate the code quality.

Screen shot to run the program



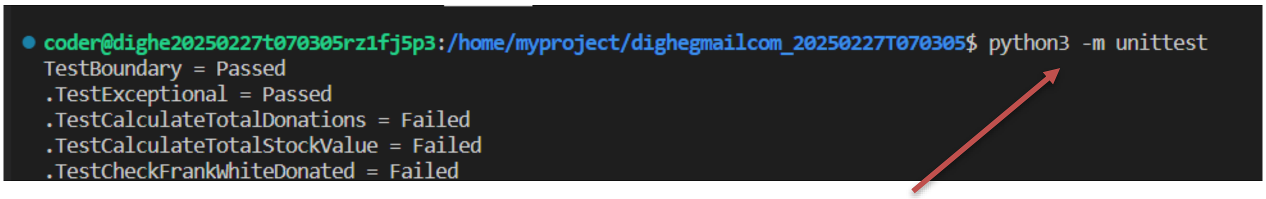
```
OK
coder@dighe20250227t070305rz1fj5p3:/home/myproject/dighegmailcom_20250227T070305$ python3 <<scriptname>>.py
```

To run the application

python3 customer_purchase_analysis.py

python3 inventory_management.py.py

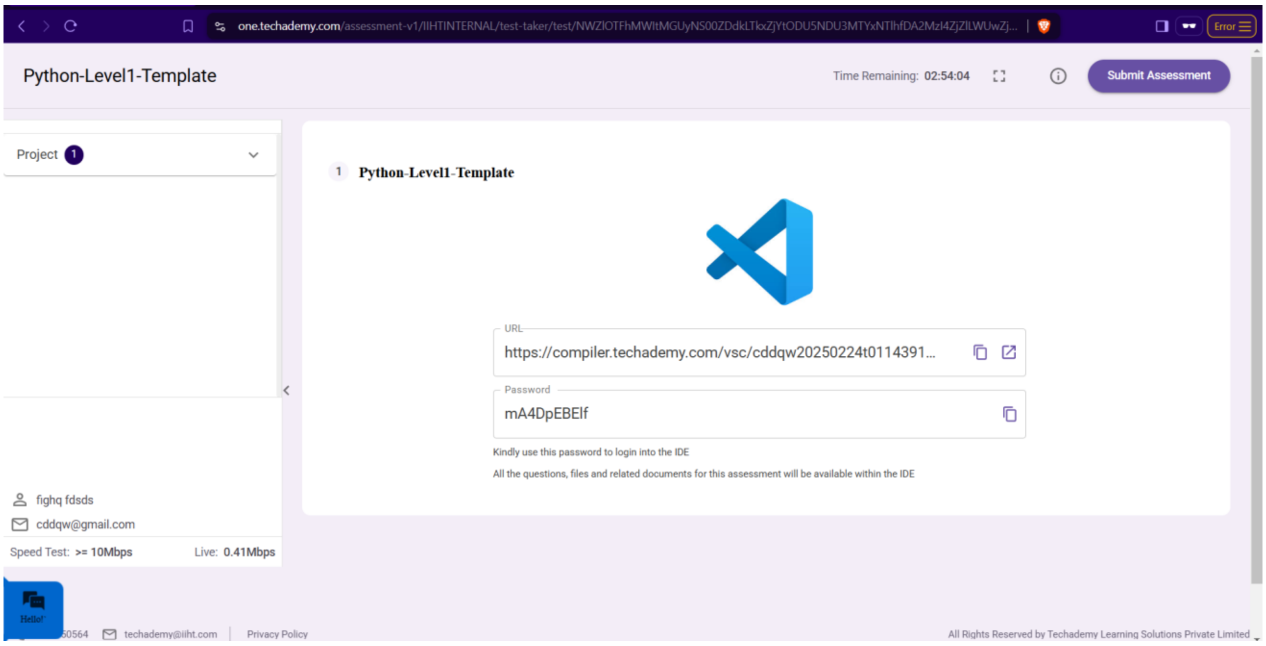
python3 weather_analysis.py



```
● coder@dighe20250227t070305rz1fj5p3:/home/myproject/dighegmailcom_20250227T070305$ python3 -m unittest
  TestBoundary = Passed
  .TestExceptional = Passed
  .TestCalculateTotalDonations = Failed
  .TestCalculateTotalStockValue = Failed
  .TestCheckFrankWhiteDonated = Failed
```

To run the testcase

- **python3 -m unittest**



one.techademy.com/assessment-v1/IIHTINTERNAL/test-taker/test/NWZIOTFhMWItMGUyNS00ZDdkLTkxZjYtODU5NDU3MTYxNTlhfDA2MzI4ZjZlLWUwZj...

Python-Level1-Template

Time Remaining: 02:54:04

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Project 1

1 Python-Level1-Template

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All the questions, files and related documents for this assessment will be available within the IDE

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Speed Test: >= 10Mbps Live: 0.41Mbps

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9.Once you are done with development and ready with submission, you may navigate to the previous tab and submit the workspace. It is mandatory to click on "Submit Assessment" after you are done with code.

10.You need to use CTRL+Shift+B - command compulsorily on code IDE, before final submission as well. This will push or save the updated contents in the internal git/repository, and will be used to evaluate the code quality.