
System Requirements Specification Index

For

Python Basics and NumPy, Pandas

Usecase 3

1.0

Use Case:1 Car Inventory Management (carinventory.py)

1) Write a Python program to search for cars within a given budget.

- Define a function `search_by_budget(inventory, max_price)`.
- The function should:
 - Filter and return the dataset of cars where the price is less than or equal to `max_price`.
 - If no cars match the criteria, return the empty dataset.

2) Write a Python program to save the car inventory into a JSON file.

- Define a function `save_inventory(inventory, filename)`.
- The function should:
 - Convert the car inventory into JSON format.
 - Save it to a file named `car_inventory.json`.
 - Return the filename.

Use Case2: Student Management System (StudentCourseManagement.py)

1) Write a Python program to add a new student in student list.

- Define a function `student_names()`.
- The function should:
 - Template code already has a list of students.
 - Append "Olivia" to the list.
 - Return the updated student list.

2) Write a Python program to store student course enrolments using a dictionary.

- Define a function `student_courses()`.
- The function should:
 - Template code already has an existing dictionary where student names as keys and their enrolled courses as tuple values.
 - Add a new entry for "Olivia" with courses ("Biology", "History").
 - Return the updated dictionary.

3) Write a Python program to store and display unique subjects across all students.

- Define a function `unique_subjects()`.
- The function should:
 - Template code already has a list of subjects (some are duplicate)
 - Add "Economics" as a new subject.
 - Remove all the duplicate subjects
 - Return the updated list of unique subjects.

Use Case3: Student Marks Analysis (StudentMarksAnalysis.py)

1) Write a Python program to compute basic statistics for student marks.

- Define a function `analyze_marks(marks)`.
- The function should:
 - Compute the average, maximum, and minimum marks using NumPy. (rounded to 2 decimal places)
 - Return these three statistics in following order as tuple : avg, max, min

2) Write a Python program to classify students based on their marks.

- Define a function `classify_grades(marks)`.
- The function should:

- o Assign grades based on the following criteria:
 - A: mark ≥ 90
 - B: mark ≥ 80
 - C: mark ≥ 70
 - D: mark < 70
- Put these grades in a list in same orders as the marks
- o Return the list of grades.

Execution Steps to Follow:

1. All actions like build, compile, running application, running test cases will be through 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)
5. These are time bound assessments the timer would stop if you logout and while logging in back using the same credentials the timer would resume from the same time 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 carinventory.py

python3 StudentMarksAnalysis.py

python3 StudentMarksAnalysis.py

To run Test cases:

python3 -m unittest

Screen shot to run the program

```
OK
coder@dighe20250227t070305r31fj5p3:/home/myproject/dighegmailcom_20250227T070305$ python3 <<scriptname>>.py
```

To run the application

`python3 carinventory.py`

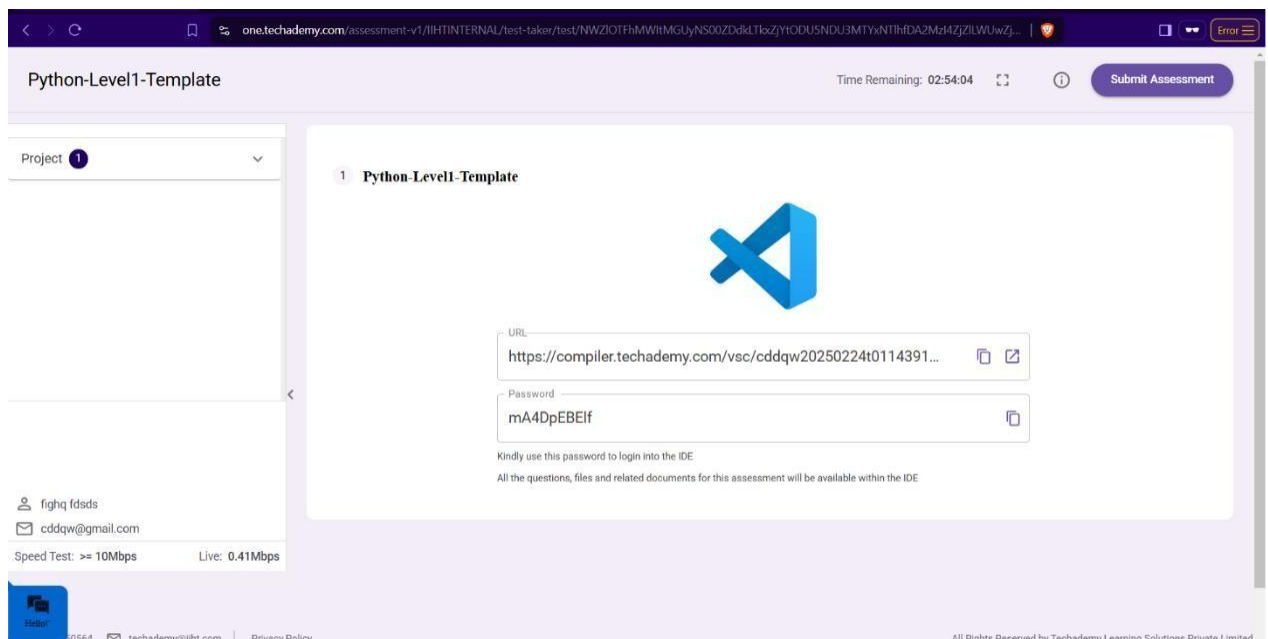
`python3 StudentMarksAnalysis.py`

`python3 StudentMarksAnalysis.py`

```
• coder@dighe20250227t070305r31fj5p3:/home/myproject/dighegmailcom_20250227T070305$ python3 -m unittest
TestBoundary = Passed
.TestExceptional = Passed
.TestCalculateTotalDonations = Failed
.TestCalculateTotalStockValue = Failed
.TestCheckFrankWhiteDonated = Failed
```

To run the testcase

- `python3 -m unittest`



8. 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.

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