**Test Plan:**

Load data scenarios:

**Test Case**: Load the data into the program

Procedure:

* Run calculator.py
* User Selects option 1 to load data
* User inputs a valid filename of a CSV file

Expected Result:

* Program reports that data is loaded successfully.
* Program displays the data that was loaded
* The program displays the menu

**Test Case**: Load the data into the program- invalid file name

Procedure:

* Run calculator.py
* User Selects option 1 to load data
* User inputs an invalid filename of a CSV file

Expected Result:

* Program reports that that file entered could not be loaded
* Program displays the menu

**Test Case:** Load the data into the program- improper data format

Procedure:

* Run calculator.py
* User Selects option 1 to load data
* User inputs a valid filename of a CSV file but the data inside the file is improperly formatted

Expected Result:

* Program reports that the CSV file is invalid
* Program displays the menu

Calculate totals Scenarios:

**Test Case:** Calculate totals with no data

Procedure:

* Run calculator.py
* User selects option 2 to calculate the data without loading any data into the program

Expected Result:

* The program reports that there is an error because there is no data
* The program displays the menu

**Test Case:** Calculate totals with data loaded but no scholarships entered

Procedure:

* Run calculator.py
* User selects option 1 and enters the filename of a CSV file
* User selects options 2 to calculate the total cost of each college

Expected Result:

* Program says that the file is loaded successfully
* Program creates a new column called totals
* Program adds all the costs of one college together and displays it in the new total cost column
* The program displays the menu

**Test Case:** Enter scholarship and then calculate totals

Procedure:

* Run calculator.py
* User selects option 1 and enters the filename of a CSV file
* User selects option 5 and enters the name of a college and a scholarship amount
* User selects options 2 to calculate the total cost of each college

Expected Result:

* Program says that the file is loaded successfully
* Program creates a new column called scholarship and displays the amount of scholarship that is entered into the program for that college
* Program adds all the costs of one college together and subtracts any scholarship amount added for that specific college
* Program adds this new value to the column called totals
* The program displays the menu

**Test Case:** Calculate totals and then enter scholarship

Procedure:

* Run calculator.py
* User selects option 1 and enters the filename of a CSV file
* User selects options 2 to calculate the total cost of each college
* User selects option 5 and enters the name of a college and the scholarship money awarded

Expected Result:

* Program says that the file is loaded successfully and displays the data
* Program creates a new column called totals
* Program adds all the costs of one college together and displays it in the totals column
* Program subtracts any scholarship amount added for that specific college and displays it in a new scholarships column
* Program updates the totals column by subtracting any scholarship amount entered
* The program displays the menu

Sort by totals scenarios:

**Test Case:** Sort by total cost and no scholarships

Procedure:

* Run calculator.py
* User chooses option 1 and enters the name of a valid csv file
* User then chooses option 2 to calculate the total cost for each college
* User chooses option 3 to sort the colleges by cost

Expected Result:

* Program says that the file is loaded successfully and displays the data
* Program creates a new totals column, calculates the total cost for each college, and displays this data
* The program then displays the colleges in a list from least to most expensive based on the total columns
* The program displays the menu

**Test Case:** Calculate cost, enter scholarship, and sort by total cost

Procedure:

* Run calculator.py
* User chooses option 1 and enters the name of a valid csv file
* User then chooses option 2 to calculate the total cost for each college
* User chooses option 5 to add scholarship money to a specific college
* User chooses option 3 to sort the colleges by cost

Expected Result:

* Program says that the file is loaded successfully and displays the data
* Program creates a new totals column and calculates the total cost for each college
* Program adds a scholarship column where it shows the value of the scholarship for that college
* Program updates the total cost column by subtracting the scholarship amount entered
* The program then puts the colleges in a list from least to most expensive based on the totals column
* The program displays the menu

**Test Case:** Enter Scholarship, calculate cost, and sort by total cost

Procedure:

* Run calculator.py
* User chooses option 1 and enters the name of a valid csv file
* User chooses option 5 to add scholarship money to a specific college
* User then chooses option 2 to calculate the total cost for each college
* User chooses option 3 to sort the colleges by cost

Expected Result:

* Program says that the file is loaded successfully and displays the data
* Program adds a scholarship column where it shows the value of the scholarship for that college
* Program creates a new totals column and calculates the total cost for each college by adding the costs and subtracting the scholarship column
* The program then puts the colleges in a list from least to most expensive based on the totals column
* The program displays the menu

**Test Case:** Sort by total cost with no calculated totals

Procedure:

* Run calculator.py
* User chooses option 1 and enters the name of a valid csv file
* User chooses option 3 to sort the colleges by cost

Expected Result:

* Program says that the file is loaded successfully and displays the data
* The program displays that it was unsuccessful at sorting the totals by cost because there is no total cost column
* The program displays the menu

**Test Case:** Sort by total cost with no data

Procedure:

* Run calculator.py
* User chooses option 3 to sort the colleges by cost

Expected Result:

* Program says that it was unsuccessful at sorting the data because no data was loaded
* The program displays the menu

Subtract Scholarship Scenarios:

**Test Case:** Subtract Scholarship but with no data

Procedure:

* Run calculator.py
* User chooses option 5 to enter the name of college and scholarship amount

Expected Result:

* Program states that the user must select a number 1-4
* Program displays the menu

**Test Case:** Subtract Scholarship but enter the wrong value for the name of the college

Procedure:

* Run calculator.py
* User chooses option 1 and load valid data into the program
* User choses 5 to add a scholarship amount
* User enters a number or an incorrect name of a college

Expected result:

* The data is loaded successfully and is displayed
* The program prompt the user to enter the name of the college
* The program states that the college entered is not found
* The program displays the menu

**Test Case:** Subtract Scholarship but entering an invalid scholarship amount

Procedure:

* Run calculator.py
* User chooses option 1 in the menu and loads valid data into the program
* User choses 5 to add a scholarship amount
* User enters the correct name of a college
* User enters a non numeric value

Expected Result:

* The data is successfully loaded and displayed
* The program prompt the user the enter the name of the college
* The program prompts the user to enter the scholarship amount for that college
* The program states that the value entered was invalid and must me numerical
* The program displays the menu

**Test Case:** Enter Multiple Scholarships

Procedure:

* Run calculator.py
* User chooses option 1 in the menu and loads valid data into the program
* User choses 5 to add a scholarship amount and enters a valid value for the college name and scholarship amount
* User choses 5 and enters multiple more scholarships for different colleges

Expected Result:

* The data is successfully loaded and displayed
* The program prompts the user to enter the name of a college and scholarship amount
* A scholarship column is created to display the scholarship amount for that college
* The scholarship column is updated for other colleges as well

**Test Case**: Multiple Scholarships for one college

Procedure:

* Run calculator.py
* User chooses option 1 in the menu and loads valid data into the program
* User choses 5 to add a scholarship amount and enters a valid value for the college name and scholarship amount
* User choses 5 and enters multiple more scholarships for the same college

Expected Result:

* The data is successfully loaded and displayed
* The program prompts the user to enter the name of a college and scholarship amount
* A scholarship column is created to display the scholarship amount for that college
* The scholarship amount is updated and added to the existing scholarship amount for that college

Other Program Scenarios:

**Test Case:** Exit the program

Procedure:

* Run calculator.py
* When the menu is displayed, the user enters number 4 to exit the program

Expected result:

* The program should exit without error

**Test Case:** User doesn’t enter the correct value for the menu

Procedure:

* Run calculator.py
* When the menu is displayed, the user enters a number that is not one of the options, or a non numerical value

Expected result:

* The program states that the value entered is invalid and must be a numerical value 1-4

**Test Case:** Calculating totals with improper data

Procedure:

* Run calculator.py
* Load improper data into the program
* User selects option 2 to calculate the data

Expected Result:

* Program states that the data has improper format
* Program states that no data is loaded yet

View Benefit Scenarios:

**Test Case:** user inputs the name of college to see benefits

Procedure:

* Run calculator.py
* User selects option one and successfully loads the data into the program
* User selects option 6 and types the name of the college to see the benefits

Expected Result:

* Program successfully loads the data into the program and displays it
* Program prompts the user to enter the name of the college
* The program displays three benefits for the chosen college

**Test Case:** User inputs invalid name of college to see benefits

Procedure:

* Run calculator.py
* User selects option one and successfully loads the data into the program
* User selects option 6 and types an invalid name of the college to see the benefits

Expected Result:

* Program successfully loads the data into the program and displays it
* Program states that the school is not found