1. Describe the necessary user inputs to your program using the following table format. Choose the appropriate data type to store each user input and explain your choice. Provide a screenshot of your Python code ONLY for prompting and storing user input.

Note that you are expected to take into consideration the value(s) of each transaction category. For example, your program should assess the transaction amount of each bill paid by the user before classifying it under the bill payment category.

(15 marks)

|  |  |  |
| --- | --- | --- |
| Input | Data type chosen | Why |
| Estimated Bonus$aver Average Daily Balance | Float | Balance is a continuous value with decimal places hence, float will be the most appropriate datatype to store it |
| Spending Amount Category | Int | The spending amount will be grouped into 3 different categories denoted by the integer values of:  **1** = less than S$500 (+ 0% interests) **2** = between S$500 and S$1,999 (+ 0.25% interests) **3** = S$2,000 or greater (+ 0.75% interests)  Based on the user selection, different interest amount will apply |
| Salary Credit | Boolean | As it is a true or false statement:  “Would your monthly salary credit be S$3,000 or more?”  The boolean datatype fits the requirement perfectly |
| Invest | Boolean | As it is a true or false statement:  “Would you insure or invest in eligible products?”  The boolean datatype fits the requirement perfectly |
| Insure | Boolean | As it is a true or false statement:  “Would you insure or invest in eligible products?”  The boolean datatype fits the requirement perfectly |
| Bill Payment | Boolean | As it is a true or false statement:  “Would you make at least 3 bill payments online?”  The boolean datatype fits the requirement perfectly |

1. A close up of text on a white background

   Description automatically generatedDraw a detailed flowchart; and then analyse and describe the logical program flow for calculating the interest earned based on the input information.

+ 0.85% pa

+ 0.10% pa

+ 0.85% pa

+ 0.40% pa

+ 0.75% pa

+ 0.25% pa

+ 0.05% pa

1. Develop ***three (3)*** test cases to test the conditional constructs in Question (b) in the most comprehensive manner possible, such that most of the conditions are tested. For each test case, describe the inputs, expected output and the screenshots of executing your program “tma.py” with EACH given set of inputs.

Test Case 1

|  |  |  |  |
| --- | --- | --- | --- |
| Action | User Input | Output | Screenshot |
| User enters valid estimated Bonus$aver average daily balance | Sting input value of “80000” | Float value of the input balance and is assigned to the variable “Balance” |  |
| User selects the monthly spending option of “S$500 to S$1,999” | String input value “2” | Int value of 2 will be returned to the main function. Main function will then add the float value of 0.25 to the current total interest rate | A screenshot of a cell phone  Description automatically generated |
| User selects “Yes” for Salary Credit | String input value “1” | Boolean value of **TRUE** is returned to the main function. Main function will then add the float value of 0.4 to the current total interest rate | A picture containing drawing  Description automatically generated |
| User selects “Yes” for Invest | String input value “1” | Boolean value of **TRUE** is returned to the main function. Main function will then add the float value of 0.85 to the current total interest rate | A picture containing drawing  Description automatically generated |
| User selects “Yes” for Insure | String input value “1” | Boolean value of **TRUE** is returned to the main function. Main function will then add the float value of 0.85 to the current total interest rate | A picture containing drawing  Description automatically generated |
| User selects “Yes” for Bill Payment | String input value “1” | Boolean value of **TRUE** is returned to the main function. Main function will then add the float value of 0.10 to the current total interest rate | A picture containing drawing  Description automatically generated |
|  |  | Returns the estimated annual interest |  |

Test Case 2

|  |  |  |  |
| --- | --- | --- | --- |
| Action | User Input | Output | Screenshot |
| User enters valid estimated Bonus$aver average daily balance | Sting input value of “20000” | Float value of the input balance and is assigned to the variable “Balance” |  |
| User selects the monthly spending option of “S$500 to S$1,999” | String input value “2” | Int value of 2 will be returned to the main function. Main function will then add the float value of 0.25 to the current total interest rate | A screenshot of a cell phone  Description automatically generated |
| User selects “No” for Salary Credit | String input value “2” | Boolean value of **False** is returned to the main function. Main function will not add any interest rate to the current total | A picture containing drawing  Description automatically generated |
| User selects “No” for Invest | String input value “2” | Boolean value of **False** is returned to the main function. Main function will not add any interest rate to the current total | A picture containing drawing  Description automatically generated |
| User selects “No” for Insure | String input value “2” | Boolean value of **False** is returned to the main function. Main function will not add any interest rate to the current total | A picture containing drawing  Description automatically generated |
| User selects “No” for Bill Payment | String input value “2” | Boolean value of **False** is returned to the main function. Main function will not add any interest rate to the current total | A picture containing drawing  Description automatically generated |
|  |  | Returns the estimated annual interest |  |

Test Case 3

|  |  |  |  |
| --- | --- | --- | --- |
| Action | User Input | Output | Screenshot |
| User enters **invalid** estimated Bonus$aver average daily balance | Sting input value of “nuvigh2” | Since the value is not an int or float value, program will return an error message and prompts the user to try again. | A picture containing drawing  Description automatically generated |
| User enters valid estimated Bonus$aver average daily balance | Sting input value of “20000” | Float value of the input balance and is assigned to the variable “Balance” |  |
| User selects **invalid** monthly spending option | String input value “4” | Since the value is not within the available options, program will return an error message and prompts the user to select again. | A screenshot of a cell phone  Description automatically generated |
| User selects the monthly spending option of “S$500 to S$1,999” | String input value “2” | Int value of 2 will be returned to the main function. Main function will then add the float value of 0.25 to the current total interest rate | A screenshot of a cell phone  Description automatically generated |
| User enters **invalid** option for Salary Credit | String input value “True” | Since the value “True” is not within the available options, program will return an error message and prompts the user to select again. | A picture containing drawing, flower  Description automatically generated |
| User selects “No” for Salary Credit | String input value “2” | Boolean value of **False** is returned to the main function. Main function will not add any interest rate to the current total | A picture containing drawing  Description automatically generated |
| User enters **invalid** option for Invest | String input value “No” | Since the value “No” is not within the available options, program will return an error message and prompts the user to select again. | A picture containing drawing  Description automatically generated |
| User selects “No” for Invest | String input value “2” | Boolean value of **False** is returned to the main function. Main function will not add any interest rate to the current total | A picture containing drawing  Description automatically generated |
| User enters **invalid** option for Insure | String input value “Yes” | Since the value “Yes” is not within the available options (either 1 or 2), program will return an error message and prompts the user to select again. | A picture containing drawing  Description automatically generated |
| User selects “No” for Insure | String input value “2” | Boolean value of **False** is returned to the main function. Main function will not add any interest rate to the current total | A picture containing drawing  Description automatically generated |
| User enters **invalid** option for Bill Payment | String input value “1wd1” | Since the value “1wd1” is not within the available options (either 1 or 2), program will return an error message and prompts the user to select again. | A picture containing drawing  Description automatically generated |
| User selects “No” for Bill Payment | String input value “2” | Boolean value of **False** is returned to the main function. Main function will not add any interest rate to the current total | A picture containing drawing  Description automatically generated |
| - | - | Returns the estimated annual interest |  |