Midterm Data Structures

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CSM III – 1 Data Structures

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**Test Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Input** | **Expected Output (Before implementation)** | **Actual Output (After implementation)** | **Result (Pass/Fail)** |
| **1** | Maria: 60 in. 145 lbs  Jessica: 64 in. 155 lbs  Andrea: 61 in. 160 lbs  Jacob: 69 in. 210 lbs  Andrew: 72 in. 200 lbs  Colton: 71 in. 198 lbs | Underweight: 0  Normal weight: 0  Overweight: 6 | Underweight:  Normal weight:  Overweight: |  |
| **2** | Maria: 69 in. 148 lbs  Jessica: 64 in. 160 lbs  Andrea: 66 in. 157 lbs  Jacob: 70 in. 200 lbs  Andrew: 72 in. 217 lbs  Colton: 75 in. 225 lbs | Underweight: 0  Normal weight: 1  Overweight: 5 | Underweight:  Normal weight:  Overweight: |  |
| **3** | Maria: 60 in. 152 lbs  Jessica: 61 in. 130 lbs  Andrea: 66 in. 155 lbs  Jacob: 64 in. 176 lbs  Andrew: 66 in. 196 lbs  Colton: 65 in. 185 lbs | Underweight: 0  Normal weight: 1  Overweight: 5 | Underweight:  Normal weight:  Overweight: |  |
| **4** | Maria: 60 in. 138 lbs  Jessica: 63 in. 145 lbs  Andrea: 64 in. 157 lbs  Jacob: 70 in. 200 lbs  Andrew: 74 in. 240 lbs  Colton: 72 in. 220 lbs | Underweight: 0  Normal weight: 0  Overweight: 6 | Underweight:  Normal weight:  Overweight: |  |

Need a variable to store names it would be called name and its data type would be string

Need a variable to store heights it would be called height and its data type would be integer

Need a variable to store weights it would be called weight and its data type would be integer

Need a variable BMI to store the BMI its data type would be integer

Need a variable to store underweight it would be called underweight and its data type would be integer

Need a variable to store overweight it would be called overweight and its data type would be integer

Need a variable to store normal weight it would be called normalweight and its data type would be integer

Retrieve user name from user into variable name

Retrieve user weight from user into variable weight

Retrieve user height from user into variable height

Perform math equation on users height and weight to determine their BMI

Perform a for loop through the three sections of determining if it is underweight/normal weight/ overweight

Store the variable in its appropriate area

Once its gone through all 6 users it then returns the amount that are underweight/normal weight/overweight

**Implementation Part**

I had to rework my original pseudocode because it did not work as I was thinking, and I have always struggled with pseudocode. Once I reworked it and got rid of a few things and reworked what I called some of the variables into actual functions to make the program work better.

Define a function called bodyMassIndex that takes in height and weight and returns the formula (weight \* 703) / (height \*\* 2)

Define another function called bodyMassIndexCategory that takes in the bodyMassIndex

Checks if bodyMassIndex is less than 18.5

Returns 0

Checks if bodyMassIndex is greater than or equal to 18.5 and bodyMassIndex is less than 25

Returns 1

Checks if bodyMassIndex is greater than or equal to 25

Returns 2

Name is a list of names

bodyMassIndexList is an empty list

underWeight is a variable that stores how many are underweight as an integer

normalWeight is a variable that stores how many are normal weight as an integer

overWeight is a variable that stores how many are overweight as an integer

Loop through all the names in name asking for the height and weight of each person

Passing them through the function bodyMassIndex and appending their numbers to the bodyMassIndexList

Another Loop checking all of the numbers stored in bodyMassIndexList through bodyMassIndexCategory checking if they are underweight normal weight or overweight

Check if they are in a group and increase that number for that group

Lastly print out how many are under weight, normal weight, and over weight

When you run this program it will start by giving you the name of the first person in the list and ask you for the height in inches and then the weight of that person in pounds. Once you have put that information in for the first person it will go through the whole list of people. Then after all of them have been entered it will output how many are over weight, under weight, and normal weight.

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