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Problem: Determine the body-mass index of a collection of 6 individuals

1. **Pseudocode**

```
Initialize list of names

Initialize array lists for BMI and number of people in each
category

Define function to determine body mass index using formula

Define function with BMI as parameter to determine if
underweight, normal, or overweight
    if BMI under 20.5
        underweight
    else if BMI between 20.5 and 25.0
        normal weight
    else if BMI is greater than or equal to 25.0
        overweight

Prompt user to input BMI in inches and pounds for each
individual using FOR loop
    If BMI is underweight/overweight/normal, add it to the
    number of individuals in that category

Add the individuals BMI to a separate list and print name and
BMI to screen

Loop through the list of BMI and call function if overweight
or underweight or normal

Print the number of individuals for each category to the
screen
```

2. **Actual code**

```
#Initialize list of names
individuals = ["JayJay","Andre","Chantel","Eugene","Ysenia","Clawdeen"]

#Initialize array lists for bmi and number of people in each category
bmiList = []
underweightBMI = 0
normalWeightBMI = 0
```

```
overweightBMI = 0

#Define function to determine body mass index
def bodyMassIndex(height, weight):
    bmi = (weight * 703) / height**2
    return bmi

#Define function with BMI as parameter to determine if underweight, normal, or
overweight
def weightCategory(userBMI):
    #if BMI under 20.5
    if userBMI < 20.5 :
        category = "underweight"
    #else if BMI between 20.5 and 25.0
    elif userBMI >= 20.5 and userBMI < 25.0:
        category = "normal weight"
    #else if BMI greater than or equal to 25.0
    elif userBMI >= 25.0:
        category = "overweight"
    return category

#Prompt user to input BMI in inches and pounds for each individual
for individual in individuals:
    print("Please enter the height in inches and weight in pounds for",individual)
    personHeight = float(input("Height: "))
    personWeight = float(input("Weight: "))
    bmi = round(bodyMassIndex(personHeight, personWeight),2)
    #If BMI is within a certain range, add it to the number of individuals in that
category
    if bmi < 20.5:
        underweightBMI += 1
    elif bmi >= 20.5 and bmi < 25.0:
        normalWeightBMI += 1
    elif bmi >= 25.0:
        overweightBMI += 1
    #Add the individuals BMI to a separate list and print to screen
    bmiList.append(bmi)
    print("The BMI of",individual,"is",bmi)

#Loop through the list of BMI and call function if overweight or underweight or
normal
for bodymass in bmiList:
    print("A BMI of",bodymass,"is considered to be",weightCategory(bodymass))
```

```
#Print the number of individuals for each category to the screen
print("\n")
print("Number of individuals that are underweight:",underweightBMI)
print("Number of individuals that are in the normal range:",normalWeightBMI)
print("Number of individuals that are overweight:",overweightBMI)
```

3. **Test Cases**
    a. Test Case 1
        i. Input: Height/Weight: = [79/195, 78/256, 64/105, 68/175, 67/136, 65/127]
        ii. Expected output: Normal, overweight, underweight, overweight, normal, normal
        iii. Actual output:

```
Please enter the height in inches and weight in pounds for JayJay
Height: 79
Weight: 195
The BMI of JayJay is 21.97
Please enter the height in inches and weight in pounds for Andre
Height: 78
Weight: 256
The BMI of Andre is 29.58
Please enter the height in inches and weight in pounds for Chantel
Height: 64
Weight: 105
The BMI of Chantel is 18.02
Please enter the height in inches and weight in pounds for Eugene
Height: 68
Weight: 175
The BMI of Eugene is 26.61
Please enter the height in inches and weight in pounds for Ysenia
Height: 67
Weight: 136
The BMI of Ysenia is 21.3
Please enter the height in inches and weight in pounds for Clawdeen
Height: 65
Weight: 127
The BMI of Clawdeen is 21.13
A BMI of 21.97 is considered to be normal weight
A BMI of 29.58 is considered to be overweight
A BMI of 18.02 is considered to be underweight
A BMI of 26.61 is considered to be overweight
A BMI of 21.3 is considered to be normal weight
A BMI of 21.13 is considered to be normal weight


Number of individuals that are underweight: 1
Number of individuals that are in the normal range: 3
Number of individuals that are overweight: 2
```

b. Test Case 2
    i. Input: Height/Weight: = [70/341, 72/155, 62/148, 69/180, 58/108, 66/127]
    ii. Expected output: Overweight, normal, overweight, overweight, normal, normal
    iii. Actual output:

```
Please enter the height in inches and weight in pounds for JayJay
Height: 70
Weight: 341
The BMI of JayJay is 48.92
Please enter the height in inches and weight in pounds for Andre
Height: 72
Weight: 155
The BMI of Andre is 21.02
Please enter the height in inches and weight in pounds for Chantel
Height: 62
Weight: 148
The BMI of Chantel is 27.07
Please enter the height in inches and weight in pounds for Eugene
Height: 69
Weight: 180
The BMI of Eugene is 26.58
Please enter the height in inches and weight in pounds for Ysenia
Height: 58
Weight: 108
The BMI of Ysenia is 22.57
Please enter the height in inches and weight in pounds for Clawdeen
Height: 66
Weight: 127
The BMI of Clawdeen is 20.5
A BMI of 48.92 is considered to be overweight
A BMI of 21.02 is considered to be normal weight
A BMI of 27.07 is considered to be overweight
A BMI of 26.58 is considered to be overweight
A BMI of 22.57 is considered to be normal weight
A BMI of 20.5 is considered to be normal weight


Number of individuals that are underweight: 0
Number of individuals that are in the normal range: 3
Number of individuals that are overweight: 3
```