CPS 188 LAB#3

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Problem #1:

```
#include <stdio.h>
#include <math.h>

int main()
{
   //*The variables are declared, with double for numerical values and character for alphabetical character values*//
   double age, RHR, MHR, THR, INTENL, INTENM, INTENH;

   char gender,fitnesslvl;
   //*Asks the user to input their gender with M for Male or F for female*//
   printf("Input your gender (M or F):");
   scanf(" %c", &gender);
   //*Asks the user to input their age*//
   printf("Input your age:");
   scanf("%lf",&age);
   //*Asks the user to input their resting heart rate (RHR)*//
   printf("Input your resting heart rate:");
   scanf("%lf",&RHR);
   //Asks the user to input their level of fitness, L for low, M for medium, H for high*//
   printf("Input your level of fitness (L, M or H):");
   scanf(" %c",&fitnesslvl);

   //*The code will follow through with the following steps if the user inputted male for their gender*//
   if(gender == 'M')
{
   //*Calculating maximum heart rate of the male, and printing it out*//
   MHR = round(203.7/(1+exp(0.033*(age-104.3))));
   printf("After calculating, your max heart rate is: %0.1fbpm",MHR);

   //*The code will follow through with the following steps for a low fitness level*//
   if(fitnesslvl == 'L')
{
   //*calculating training heart rate given a low fitness level, and then printing the THR*//
```

```
   INTENL = 0.55;
   THR = round((MHR-RHR)*INTENL+RHR);
   printf("\n Therefore, your training heart rate is: %0.1fbpm", THR);
}
   //*The code will follow through with the following steps for a medium fitness level*//
   if (fitnesslvl == 'M')
{
   //*calculating training heart rate given a medium fitness level, and then printing the THR*//
   INTENM = 0.65;
   THR = round((MHR-RHR) * INTENM+RHR);
   printf("\nTherefore, your training heart rate is: %0.1fbpm", THR);
}
   //*The code will follow through with the following steps for a high fitness level*//
   if (fitnesslvl == 'H')
{
   //*calculating training heart rate given a high fitness level, and then printing the THR*//
   INTENH = 0.8;
   THR = round((MHR-RHR) * INTENH+RHR);
   printf("\nTherefore, your training heart rate is: %0.1fbpm", THR);
}
}
   //*The code will follow through with the following steps if the user inputted female for their
gender*//
   if (gender == 'F')
{
   //*Calculating maximum heart rate of the female, and printing it out*//
   MHR = round(190.2/(1+exp(0.0453*(age - 107.5))));
   printf("\nAfter calculating, your max heart rate is: %0.1fbpm", MHR);
   //*The code will follow through with the following steps for a low fitness level*//
   if (fitnesslvl == 'L')
{
   //*calculating training heart rate given a low fitness level, and then printing the THR*//
   INTENL = 0.55;
   THR = round((MHR-RHR)*INTENL+RHR);
   printf("\nTherefore, your training heart rate is: %0.1fbpm", THR);
}
   //*The code will follow through with the following steps for a medium fitness level*//
   if (fitnesslvl == 'M')
{
   //*calculating training heart rate given a medium fitness level, and then printing the THR*//
```

```
    INTENM = 0.65;
    THR = round((MHR-RHR)*INTENM+RHR);
    printf("\nTherefore, your training heart rate is: %0.1fbpm", THR);
}
    //*The code will follow through with the following steps for a high fitness level*//
    if (fitnesslvl == 'H')
{
    //*calculating training heart rate given a high fitness level, and then printing the THR*//
    INTENH = 0.8;
    THR = round((MHR-RHR)*INTENH+RHR);
    printf("\nTherefore, your training heart rate is: %0.1fbpm", THR);
}
}
    return (0);
}
```

Heart rate of three individuals:

```
Input your gender (M or F):M
Input your age:19
Input your resting heart rate:64
Input your level of fitness (L, M or H):M
After calculating, your max heart rate is: 192.0bpm
Therefore, your training heart rate is: 147.0bpm

...Program finished with exit code 0
Press ENTER to exit console.
```

```
Input your gender (M or F):F
Input your age:20
Input your resting heart rate:63
Input your level of fitness (L, M or H):H

After calculating, your max heart rate is: 187.0bpm
Therefore, your training heart rate is: 162.0bpm

...Program finished with exit code 0
Press ENTER to exit console.
```

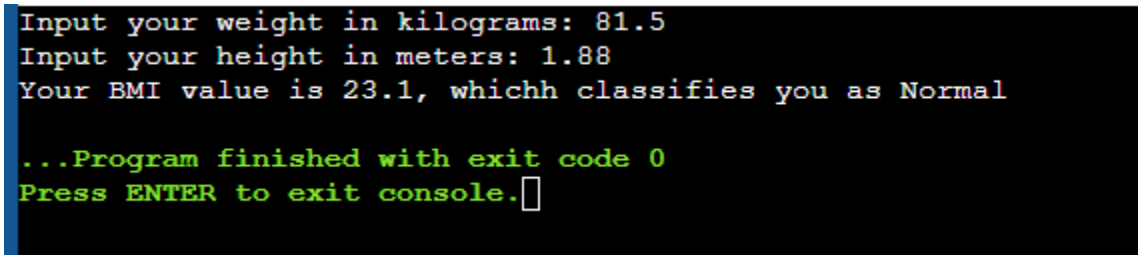
```
Input your gender (M or F):M
Input your age:63
Input your resting heart rate:82
Input your level of fitness (L, M or H):L
After calculating, your max heart rate is: 162.0bpm
 Therefore, your training heart rate is: 126.0bpm

...Program finished with exit code 0
Press ENTER to exit console.
```

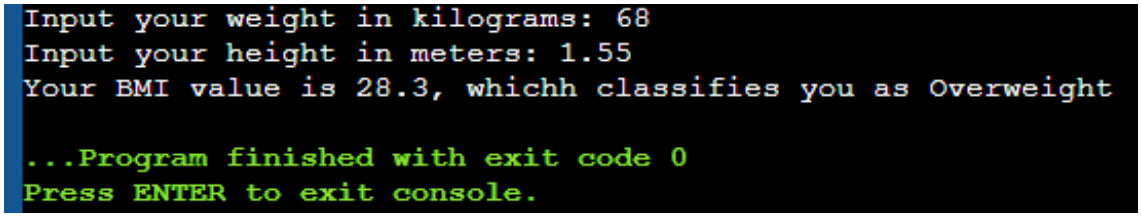
Problem 2

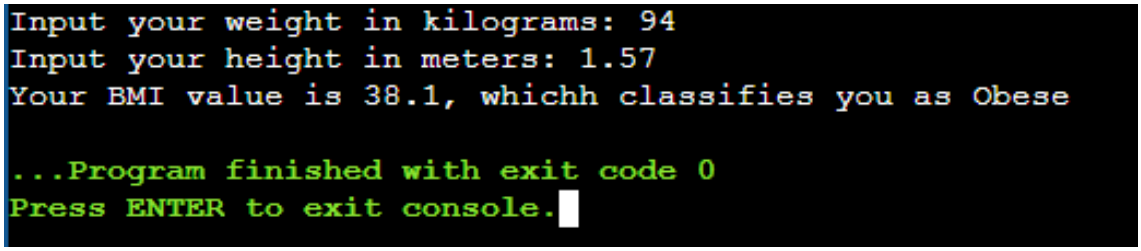
```
# include <stdio.h>
# include <math.h>

int main()
{
   //*Declares the variables, BMI standing for Body Mass Index, hght for height and wght for
weight*//
   double BMI, hght, wght;
   //*Asks the user to input their weight in kilograms*//
   printf("Input your weight in kilograms: ");
   scanf("%lf", &wght);
   //*Asks the user to input their height in meters*//
   printf("Input your height in meters: ");
   scanf("%lf", &hght);
   //*Calculates the BMI value of the user based on their inputted height and weight*//
   BMI = wght / pow(hght, 2);
   //Program will go through this path if the calculated BMI value is less than 18.5*//
   if (BMI < 18.5)
{
   //*Prints this statement if the BMI value is less than 18.5*//
   printf("Your BMI value is %0.1f, whichh classifies you as Underweight", BMI);
}
   //Program will go through this path if the calculated BMI value is more than 18.5 and less than
24.9*//
   if (BMI > 18.5)
{
   //Program will go through this path if the calculated BMI value is more than 18.5 and less than
24.9*//
   if (BMI < 24.9)
{
   //*Prints this statement if the BMI value is between 18.5 and 24.9*//
   printf("Your BMI value is %0.1f, whichh classifies you as Normal", BMI);
}
}
   //Program will go through this path if the calculated BMI value is more than 25 and less than
29.9*//
   if (BMI > 25)
{
```

```
   //Program will go through this path if the calculated BMI value is more than 25 and less than
29.9*//
   if (BMI < 29.9)
{
   //*Prints this statement if the BMI value is between 25 and 29.9*//
   printf("Your BMI value is %0.1f, whichh classifies you as Overweight", BMI);
}
}
   //Program will go through this path if the calculated BMI value is 30 or greater*//
   if (BMI >= 30)
{
   //*Prints this statement if the BMI value is 30 or greater*//
   printf("Your BMI value is %0.1f, whichh classifies you as Obese", BMI);
}
return (0);
}
```

Obesity of three individuals:







Problem 3

```
# include <stdio.h>
# include <math.h>

int main()
{
   //*Declares the variables that are being used in the program*//
   int c, k;
   double quiz[10], X, Y, AVGquiz, midtrm, final, prcntMID, prcntFINAL, finalMARK;

   //*Asks for the user's midterm exam mark*//
   printf("Input your midterm exam mark (from 0-100): ");
   scanf("%lf", &midtrm);

   //*Asks for the user's final exam mark*//
   printf("Input your final exam mark (from 0-100): ");
   scanf("%lf", &final);

   //*Code removes the lowest mark after sorting the marks in ascending order*//
   for (c = 0; c<10; c++)
   {
   //*Makes a loop where it asks for 10 quiz marks*//
   printf("Input all 10 of your quiz marks:");
   scanf("%lf",&quiz[c]);
   }
   {
      //*Code removes the lowest mark after sorting the marks in ascending order*//
      for (k = c + 1; k < 10; k++)
      {
         if (quiz[c] > quiz[k])
         {
            X = quiz[c];
            quiz[c] = quiz[k];
            quiz[k] = X;
         }
      }
   }
   //*After removing the lowest mark, it sums up the 9 marks*//
   for (c = 1; c < 10; c++)
```

```
    {
    Y = Y + quiz[c];
    }

    //*Calculates the average of 9 marks*//
    AVGquiz = Y/9;
    //*This path will be followed if the midterm mark is equal to or less than the final exam
mark*//
    if (midtrm >= final)
    {
    prcntMID = 0.35;
    prcntFINAL = 0.4;
    }
    //*This path will be followed if the final mark of the exam is more than the midterm mark*//
    else if (final > midtrm)
    {
    prcntMID = 0.25;
    prcntFINAL = 0.5;
    }
    // *Solving for the final mark*//
    finalMARK = ((final * prcntFINAL)+(midtrm*prcntMID)+(AVGquiz * 0.25 * 10));
    //The calculated final mark is now printed*//
    printf("Your final mark is: %0.2f percent", finalMARK);
    return 0;
}
```

Use of program for three individuals

```
Input your midterm exam mark (from 0-100): 73
Input your final exam mark (from 0-100): 84
Input all 10 of your quiz marks:9.5
Input all 10 of your quiz marks:6
Input all 10 of your quiz marks:4
Input all 10 of your quiz marks:10
Input all 10 of your quiz marks:7.8
Input all 10 of your quiz marks:3.4
Input all 10 of your quiz marks:9
Input all 10 of your quiz marks:5.6
Input all 10 of your quiz marks:9
Input all 10 of your quiz marks:10
Your final mark is: 78.25 percent

...Program finished with exit code 0
Press ENTER to exit console.
```

```
Input your midterm exam mark (from 0-100): 89
Input your final exam mark (from 0-100): 81
Input all 10 of your quiz marks:9.5
Input all 10 of your quiz marks:8.4
Input all 10 of your quiz marks:9
Input all 10 of your quiz marks:10
Input all 10 of your quiz marks:7.8
Input all 10 of your quiz marks:10
Input all 10 of your quiz marks:9
Input all 10 of your quiz marks:9.6
Input all 10 of your quiz marks:9
Input all 10 of your quiz marks:10
Your final mark is: 86.55 percent

...Program finished with exit code 0
Press ENTER to exit console.
```

```
Input your midterm exam mark (from 0-100): 80
Input your final exam mark (from 0-100): 70
Input all 10 of your quiz marks:8.5
Input all 10 of your quiz marks:8.5
Input all 10 of your quiz marks:9
Input all 10 of your quiz marks:8.5
Input all 10 of your quiz marks:7.5
Input all 10 of your quiz marks:7
Input all 10 of your quiz marks:9
Input all 10 of your quiz marks:9.5
Input all 10 of your quiz marks:10
Input all 10 of your quiz marks:10
Your final mark is: 77.94 percent

...Program finished with exit code 0
Press ENTER to exit console.
```