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[CPSC 230]

Chapter 2- Homework

(150 points)

Q1- (50 pts)

Workers at a particular company have won a 5% pay increase retroactive for six months. Write a program that takes an employee's previous annual salary as input, and outputs the amount of retroactive pay due the employee, the new annual salary, and the new monthly salary. Your program should allow the calculation to be repeated as often as the user wishes.

```
//CPSC 230 RAVI PATEL Salary Increase Calculator
#include <iostream>

using namespace std;
int main(int argc, char *argv[]) {

double previousSalary, paydue, annualsalary, monthlysalary;
const double increase = .05; //5% pay increase retroactive for 6 months
char choice;
do {
     cout <<"Previous annual salary? : $"; //ask user input previous salary
     cin >> previousSalary;
     paydue = ((previousSalary * increase)/2); //calculate pay due
     cout<<"Amount of retroactive pay due is : $" << paydue; //display pay due
     cout << "\n";
     annualsalary = (previousSalary * (1+increase)); //calculate annual salary
     cout<<"New annual salary is : $"<<annualsalary; //display annual salary
     cout<<"\n";
     monthlysalary = (previousSalary *(1+ increase)/12); //calculate monthly
salary
     cout<<"New monthly salary is : $"<<monthlysalary; //display monthly salary
     cout<<"\n";
     cout<<"Continue to run program? Repeat Calculation? Input - 'y' or 'Y' :
"; //ask user to cont.
     cin>>choice;
     }

     while(choice == 'y' || choice == 'Y'); //do loop above while user wants to
continue

}
```

```
//SAMPLE OUTPUT:
//Previous annual salary? : $100000
//Amount of retroactive pay due is : $2500
//New annual salary is : $105000
//New monthly salary is : $8750
//Continue to run program? Repeat Calculation? Input - 'y' or 'Y' : n
```

Q2 (50 pts)

The Harris-Benedit equation estimates the number of calories your body needs to maintain your weight if you do no exercise. This is called your basal metabolic rate, or BMR. The formula for the calories needed for a woman to maintain her weight is

$$BMR=655+ (4.3* \text{ weight in pounds})+(4.7 *\text{height in inches})-(4.7 *\text{age in years})$$

The formula for the calories needed for a man to maintain his weight is

$$BMR= 66+ (6.3*\text{weight in pounds})+(12.9*\text{height in inches})-(6.8* \text{ age in years})$$

A typical chocolate bar will contain around 100 calories. Write a program that allows the user to input his or her weight in pounds, height in inches, age in years, and the character 'M' for male and 'F' for female. The program should then output the number of chocolate bars that should be consumed to maintain one's weight for the appropriate sex of the specified weight, height, and age.

```
//CPSC 230 RAVI PATEL BMR CALCULATOR
#include <iostream>

using namespace std;
int main(int argc, char *argv[]) {

char gender; //declare char gender
char choice; //declare char choice

do {
     cout<<"Gender (M or F): "; //ask user input
     cin>>gender; //assign input to gender

     switch(gender) //using switch assign gender to catch invalid input
          {
          case 'M':
          break;

          case 'F':
          break;

          default:
          cout<<"Unidentified Input. Please Enter Gender (M or F): ";
          cin>>gender;
          }

int Weight,Height,Age; //declare ints for calculations
double bmr; //declare BMR as a double for calculations

     cout<<"Weight (in pounds): "; //ask user input
     cin>>Weight; //assign user input
     cout<<"Height (in inches): "; //ask user input
     cin>>Height; //assign user input
     cout<<"Age (in years): "; //ask user input
     cin>>Age; //assign user input
     //bmr calculations for male and female
```

```
     if (gender == 'M') //if gender is Male
     {
     bmr = 66 + (6.3 * Weight) + (12.9 * Height) - (6.8 * Age); //calc BMR
     cout<<"The man must eat " << (bmr/100) << " candy bars in one day to maintain
their weight." <<endl; //BMR per 100 cal
     }
     else if (gender == 'F') //if gender is Female
     {
     bmr = 655 + (4.3 * Weight) + (4.7 * Height) - (4.7 * Age); //calc BMR
     cout<<"The woman must eat "<<(bmr/100)<< " candy bars in one day to maintain
their weight."<<endl; //BMR per 100 cal
     }

     cout<< "Would you like to continue the program? Input 'y' or 'Y': "; //ask
user input
     cin >> choice; //assign user input

     }

     while(choice == 'y'|| choice == 'Y'); //while choice is to continue

     cout<<"\n";
     cout<<"\n";

     return 0;
}
```

//SAMPLE OUTPUT:
//Gender (M or F): M
//Weight (in pounds): 130
//Height (in inches): 67
//Age (in years): 22
//The man must eat 15.997 candy bars in one day to maintain their weight.
//Would you like to continue the program? Input 'y' or 'Y': n

Q3- (25 pts)
Choose the correct answer:

1. Which of the following is not a valid identifier?
   a. return
   b. myInt
   c. myInteger
   d. total3 Answer: **A - return**

2. What is the value of x after the following statements?

```
int x, y, z;
y = 10;
z = 3;
x = y * z + 3;
```

   a. Garbage
   b. 60
   c. 30
   d. 33 Answer: **D - 33**

3. Which of the following statements is NOT legal?
   a. char ch='b';
   b. char ch='0';
   c. char ch=65;
   d. char ch="cc"; Answer: **D - char ch="cc";**

4. What is the value of x after the following statements?

```
double x;
x = 0;
x += 3.0 * 4.0;
x -= 2.0;
```

   a. 22.0
   b. 12.0
   c. 10.0
   d. 14.0 Answer: **C - 10.0**

5. Executing one or more statements one or more times is known as:
   a. selection
   b. iteration
   c. sequence
   d. algorithm Answer: **B - iteration**

Q4-(25 pts)

1. The stream that is used for input from the keyboard is called **cin,** and the stream that is used for output to the screen is called **cout.**

2. Write the loop condition to continue a while loop as long as x is negative.
    a. **while (x < 0)**

3. When must we use braces to define the body of a conditional expression?
    a. **When there are multiple statements in the body of a conditional expression**

4. In a compound logical and (&&) expression, the evaluation of the expression stops once one of the terms of the expression is false. This is known as **short-circuit** evaluation.

5. Is << used for input or output? **<< is used for OUTPUT**