CSE 111 1. Midterm

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I. QUESTION (15 POINTS)

The Harris-Benedict 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 calories needed for a woman to maintain her weight is:

$$BMR = 655.1 + (9.6 \times w) + (1.85 \times h) - (4.7 \times a)$$

The calories needed for a man to maintain his weight is:

$$BMR = 66.5 + (13.75 \times w) + (5 \times h) - (6.75 \times a)$$

where w is the weight of the person in kg, h is the height of the person is cm, and a is the age of the person.

A typical chocolate bar will contain around 230 calories. Write a program that allows the user to input their weight, height, and age. The program should then output the number of chocolate bars that should be consumed to maintain ones weight for both a woman and a man.

```
What is your age?
25
What is your height?
185
What is your weight?
87
If you're female, you should eat 7.45 candy
If you're male, you should eat 8.78 candy
```

II. QUESTION (15 POINTS)

Write a program that reads the amount of a monthly mortgage payment, the amount still owed (the outstanding balance) and the annual interest rate then displays the amount of the payment that goes to interest and the new principal (i.e., the amount that left after reducing the debt).

$$InterestPaid = Principal \times (InterestRate/12)$$

```
Enter this month's payment
1000
Enter principal owed
10000
Enter interest rate
0.12
Interest paid: 100
New principle: 9100
```

III. QUESTION (20 POINTS)

A palindrome is a sequence of characters that reads the same backward as forward. For example, each of the following four-digit integers is a palindrome: 1221, 5555, 4554 and 8118. Write a program that reads in a four-digit integer and determines whether it is a palindrome. If the number is not four digits long, display an error message and exit the program. Otherwise, check if its a palindrome or not.

```
Enter number
1441
The number is palindrome
```

IV. QUESTION (20 POINTS)

Write a program that reads two fractions (like 2 / 5) and one operator (+, -, x, /) from the user. The program will then calculate and display the result of that operation as a fraction. Your program will take digits as operators (1 for +, 2 for -, 3 for x, 4 for /). For each fraction, you will read first the nominator then the denominator. You must use switch to solve this question.

```
Enter the operator
2
Enter nominator of the first fraction
1
Enter denominator of the first fraction
2
Enter nominator of the second fraction
1
Enter denominator of the second fraction
3
The result is 1 / 6
```

V. QUESTION (15 POINTS)

Write a program, which reads three integers and displays the median of those three integers.

```
Enter three integers
7 3 10
Median is 7
```

VI. QUESTION (15 POINTS)

The total price of a product is the price of the product plus the sales tax. The sales tax is of a product depends on the type of the product (an integer). If the type of the product is 172, the sales tax is 18%; if the type of the product is 188, the sales tax is 8%; if the type of the product is 196, the sales tax is 0%. Write a program that will read the total price of the product, the type of the product and displays the price of the product. Your program will also display a message if the type of the product is incorrect. You must use switch to solve this question.

```
Enter total price of the product
1080
Enter type of the product
188
Price of the product is 1000
```