FEDERAL RURAL UNIVERSITY OF THE SEMI-ARID
COMPUTER SCIENCE COURSE
COMPUTER PROGRAMMING

LABORATORY 3

VARIABLES, CONSTANT IF ASSIGNMENT

REVIEW EXERCISES

YOU MUST FOLLOW US TO OBTAIN COMPLEMENTARY INFORMATION

1. Use just one cin statement to read the three information below for different variables. Multiply the value of the height, width and length variables to find the volume of the cube.

```
Enter the height, width and length:
2.1 3.5 5.0
The volume is 36.75 cubic cm.
```

The program works if pressedENTERinstead ofSPACEafter entering each number?

```
Enter the height, width and length:
2.1
3.5
5.0
The volume is 36.75 cubic cm.
```

What if we use a cin instruction for each number? Is it still possible to enter all numbers on the same line? Do the test.

2. Use cin statements to read the hours and minutes value for different variables.

```
What time is it?3:50 pm
15 hours
50 minutes
```

Tip: the ":" separator can be read for a variable of typecharor ignored.

FIXATION EXERCISES

YOU MUST DO THE EXERCISES TO FIX THE CONTENT

1. Fix and run the program below:

```
# include <iotrem>

void Main()
{
        int seconds, int minutes;

        cout << Enter a number of minutes: cin >> minutes

        cout << There are << seconds << " seconds in "
                << minutes << minutes.
        seconds = 100 * minutes; Cout <<
        endl;

        system("pause");
        returns NULL;
}
```

If the user types 2, the program should show:

```
There are 120 seconds in 2 minutes.
```

2. Write a program that creates an integer variable called**measure**. Assign the value 10 to this variable. Calculate and display the value of 2 times measure and measure squared. The program should display the three values as in the example below:

```
Size: 10
2x measure: 20
Measure squared: 100
```

Challenge: try to do this program using just one variable.

3. Write a program that reads your age in years and converts it to days. The program must display both values on the screen, as in the example below.

```
Enter your age:20
20 years equals 7300 days.
```

LEARNING EXERCISES

YOU MUST WRITE PROGRAMS TO REALLY LEARN

1. Build a program to calculate the amount of money spent by a smoker. The program must read the number of years the user has smoked, the number of cigarettes smoked per day and the price of a pack of 20 cigarettes. The output should look similar to the example below.

```
How many years have you smoked?10 How
many cigarettes do you smoke a day?5
What is the average price of a pack of cigarettes?6.50 So far you
have spent R$5931.25 on cigarettes.
```

2. Build a program to display the multiplication table of any number n, where n is a user-supplied number.

```
multiplication table of n
- - - - - - - - - - - -
Enter a number n (0 to 9):two 2 x 0 = 0

2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14
2 x 8 = 16
2 x 9 = 18
```

3. The energy spent in calories with any aerobic activity follows the equation: E = METS × WEIGHT × (Activity Time / 60). Time is given in minutes. Weight is given in kilograms. METS stands for aerobic capacity and depends on the type of exercise. Cycling or light running has a METS score = 7.0. Swimming has a METS score = 8.0.

   A user must enter their weight, how long they run per week, how long they cycle per week, and how long they swim per week. Your program should return the number of calories this user burns per week with physical exercise.

```
Enter your weight in kilograms:75 Enter race
time:2h30m Enter cycling time:1h00m Enter
swimming time:1h20m You've expended a total
of 2637.5 calories.
```

4. The cost of a new car to the consumer is the sum of the factory cost plus the distributor's percentage and taxes (applied to the factory cost). Assuming that the distributor's percentage is 28% and taxes are 45%, write a program to read the factory cost of a car and write the cost to the consumer.

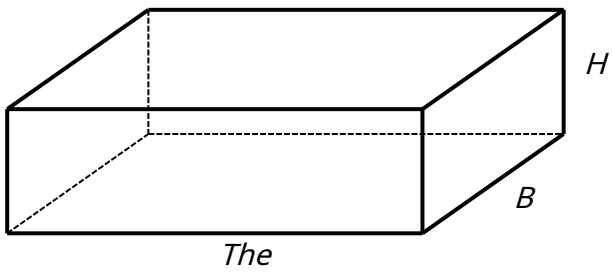
```
factory cost:60000
The cost to the consumer is R$103,800
```

5. Build a program that asks the user for the current time. Declare variables to receive the hour and minutes separately. After receiving the current time, tell the user that their clock is one hour behind, and show the correct time, with the time moving forward by one hour.

```
What time is it?10:54
Your clock is slow. It is now 11:54.
```

Observation: The time will be entered in the format HH:MM. Try to save the colon in the time reading, and to show them again in the result display. Remember that dots are a character.

6. Build a program that calculates**the base area**and the**volume**of a rectangular prism. First, ask the user for the values of the sides of the base of the prism. Calculate the area of the base, assign it to a variable and show the value of this variable. Then, ask for the height of the prism, use the formula = *h*to calculate the volume of the prism, assign this value to another variable and show the result.



The

```
Side to:10
Side B:8
base area =80
Height:3
Prism volume =240
```