**Lab 5 – Complex calculations and formatting output**

Objectives

* Remember lets create one solution named Lab5 and it will contain projects (Q1,Q2…Q3)
* Remember coding good practices (neat code, commented, well indented, good identifier names etc..)
* Visual studio top tips (cw tab tab, Ctrl F5 etc…share tips with each other)
* Formatting our output with format string and format codes
* Work with all arithmetic operators, operator precedence, build complex arithmetic expressions
* Work with constants – why and how
* Working with the Math class (Math.Pow)
* Demo integer division that results in data loss (e.g. int x = 5 / 2)

Q1 (demo of formatting and of format codes need) – **look at the book on page 55**

Console.WriteLine($"my hourly rate is {22.5:c}");

Console.WriteLine($"my name is {Frank} and hourly rate is {22.5:c}”);

Write a program that

Displays 1547.2 as €1,547.20

Displays 0.23 as 23%

Displays 15000 as 15,000

Displays 432.8175 as 432.818

Displays 300000 as 3.00E+005

Hint : Must specify encoding that includes euro symbol

Console.OutputEncoding = System.Text.Encoding.UTF8;

Q2

Write a program to read in an employee’s name and salary calculate their tax and take home pay. Tax is charged at 40%. Store the tax rate as a constant in your program.

Output the result in the format

With a tax rate of xx%, tax is €x,xxx.xx and take home pay is €x,xxx.xx

Q3

The repayment amount on a loan with a fixed rate of interest can be calculated using the formula

[P \* R \* (1+R)^N]/[(1+R)^N-1]

Wherein,

P is the loan amount

R is the rate of interest per annum

N is the number of period or frequency wherein loan amount is to be paid

Information about the formula and calculator to check your answer can be found [here](https://www.wallstreetmojo.com/loan-repayment-calculator/)

It is important to keep the rate per period and number of periods consistent with one another in the formula. If the loan payments are made monthly, then the rate per period needs to be adjusted to the monthly rate (r / 12) and the number of periods would be the number of months on the loan.

Format you output appropriately.

(Hint x = Math.Pow(y,n) returns  *yn* to the variable x) – demo needed

Q4

Write a program that reads an integer number of seconds, converts it to an equivalent number of hours, minutes and seconds and outputs the result.

Example output:

52,400 seconds is equal to 15 hours, 3 minutes and 20 seconds

(Hint : % returns the remainder, e.g. x = 17 % 5; assigns a value of 2 to x)

Q5

Implement a program that directs a cashier to give change. The program has two inputs: the amount due and the amount received from the customer. Display the euros, fifties, twenties, tens, fives, twos and cents that the customer should receive in return. (Assume highest coin/note is a Euro)

For example, for change of €1.98

1 Euro,1 Fifty,2 Twenties,1 Five, 1 Two1 cent

Q6

Write a program to create the league table as outlined below, and populate it with the results for 3 teams

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Team | Played | Wins | Losses | Draws | Point | Percentage |
| Sligo It | 2 | 0 | 1 | 1 | 1 | 16% |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

For each team input the team name, number of wins, number of losses and number of draws. Your program will work out the number of games played, the number of points and the percentage of points achieved from possible total.

Win = 3 points, Draw = 1 point, Loss = 0 points.

(hint use formatting to create the table – demo needed)