

CSCI 1301 – Lab 05

September 17, 2019

1 Reading From the User

1. Download the PersonalizedWelcomeMessage¹ project.
2. Extract it, and open it in VS.
3. (If you are using VS on MAC, follow the instructions at <https://stackoverflow.com/a/49056993/> to have your project “Run on external console”. You will need to do that for every solution where the user is supposed to enter values.)
4. Compile and execute it.
5. You will be prompted with the message

```
Please, enter your first name, followed by "Enter":
```

Enter your first name, followed by Enter . You just witnessed an interaction between a program and the user!

6. Read the source code, and make sure you understand all of it.
7. Change the code, so that the program would also ask the user’s last name, and print both their first and last names.

2 Numeric Datatypes

For this part, I recommend opening the web page², printable version³ or editable version⁴ of the document I mentioned in class. Note that it contains numerous references at its end.

2.1 Experimenting

Compute in your head the result of the following operation: $1000000.0 + 1.2 - 1000000.0$.

Now, implement it (read as “Create a new project and write in the Main method the code below, to display at the screen the result of this computation, as computed by C#”) using float, double, and decimal:

```
Console.Write("With floats:\n\t");  
Console.WriteLine(1000000.0f + 1.2f - 1000000.0f);  
Console.Write("With double:\n\t");  
Console.WriteLine(1000000.0 + 1.2 - 1000000.0);  
Console.Write("With decimal:\n\t");  
Console.WriteLine(1000000.0m + 1.2m - 1000000.0m);
```

¹PersonalizedWelcomeMessage.zip

²../shared/datatypes/

³../shared/datatypes/index.pdf

⁴../shared/datatypes/index.docx

Compile and execute your program. Can you explain what you just observed?

Now, execute the following code:

```
decimal decVar = 12344321.4999999991M;
double douVar = (double)decVar;
float floVar = (float)douVar;
Console.WriteLine($"With decimal: {decVar} \nWith double: {douVar} \nWith
↪ float: {floVar}");
```

Can you explain the gradual loss of precision?

2.2 Making Simple Calculations

This part should be first carried out without using VS.

Assume we have the following statements:

```
int a = 21, b = 4;
float f = 2.5000000f;
double d = -1.3;
decimal m = 2.5m;
```

Answer the following:

- How many variables are declared?
- What are their datatype?
- What are their values?
- What are their names?
- Consider the following expressions. For each of them, tell if they are legal, and if so, give the result and its corresponding datatype. The first two are given as examples.

Operation	Legal?	Result	Datatype
a + d	Yes	19.7	double
m + f	No	—	—
a / b	—	—	—
b * f	—	—	—
d + f	—	—	—
d + b	—	—	—
a + m	—	—	—
f / m	—	—	—
d * m	—	—	—

You can check your answers using VS: create a new project, copy the variables declarations and assignments, and write your own statements to perform the calculations in the Main method. For instance, if you want to check that the result of a + d is of type double, write something like

```
double tempVariable1 = a + d;
Console.WriteLine($"The value of d+f is {tempVariable1}");
int tempVariable2 = a + d; // This line should give you an error.
```