

# CSE1341 – Lab #1

## PRE-LAB [10 points]

Must be done prior to your lab session .

Read the “Java SE – JDK Installation Instructions ” (found in Appendix A in the textbook, or **provided by the instructor.**) Install the JDK (Java Development Kit) on your own computer.

All: To use *java* and *javac* from the command line

Mac: Spotlight: Terminal

Windows\*: Start->Run... and enter **cmd**

All operating systems: Type the program below into a file name “FirstProgram.java” using Notepad (Windows) or TextEdit (Mac) and compile it using javac in the Windows CMD window / or Mac Terminal window. Execute it using the “java” command in the Windows CMD window / or Mac Terminal window. Mac users – see the note at the end of this document regarding settings in the TextEdit app.

```
import java.util.Scanner;

public class FirstProgram
{
    public static void main(String[] args)
    {
        Scanner input = new Scanner(System.in);

        System.out.println("This is my first Java program!");
        System.out.print("What is your name? ");
        String name = input.next();

        System.out.printf("Hello %s welcome to CSE 1341 at SMU! \n", name);

        System.out.println("I am pretty intelligent. I can count the numbers from 1 to 50 and find their sum!");

        int total =0;
        for (int i=1; i<=50; i++)
        {
            System.out.print(i + " ");
            total = total + i;
        }
        System.out.printf("\nThe sum is %d. \n", total);
    }
}
```

If this compiles and executes correctly your installation of Java was successful. If you experience problems, bring your laptop to the lab and ask for help.

## LAB - Syntax Errors and Productivity Software [90 points]

**1)** [10 points] Start with the program you typed and compiled. Remove the two semi-colons (;) and try to compile your program. Paste the program and the error message into a word/open office document and explain what this message means.

**2)** Create a spreadsheet with solutions to the following four algorithm problems:

**2a)** [20 points] – The Fibonacci sequence is a pattern of integers starting with zero and one, where each subsequent value is equal to the sum of the prior two values:

$$F_n = F_{n-1} + F_{n-2}, \text{ where } F_0 = 0 \text{ and } F_1 = 1.$$

Create a spreadsheet which contains the first two numbers of the Fibonacci sequence, and calculates each the next 25 values:

1	0
2	1
3	1
4	2
5	3
6	5
7	8
8	13
9	21
10	34
11	55
12	89
13	144
14	233
15	377
16	610
17	987
18	1597
19	2584
20	4181
21	6765
22	10946
23	17711
24	28657
25	46368
26	75025
27	121393

**2b) [20 points] – World Population**

The total world population was estimated at 7.6440 billion people in August 2018. Assuming an annual growth rate of 1.09% per year, create a spreadsheet showing the world population in 2018 and for each of the next 25 years. Hint: if calculated properly, the U.S. population in 2043 would be 10.0236 billion people.

Year	World Population in Billions
2018	7.6440000
2019	7.7273196
2020	7.8115474
2021	7.8966933
....	.....
....	.....

**2c) [20 points] – Customary unit conversion.**

Create a spreadsheet that converts the following:

1. Liter to gallon
2. Gallon to liter
3. Kilometers to miles
4. Miles to kilometers

The conversion formulas:

1 liter	=	0.264172 gallon
1 gallon	=	3.78541 liters
1 kilometer	=	0.621 mile
1 mile	=	1.609 kilometers

Use the following sample data in your spreadsheet - for grading purpose.

liter to gallon:	
liter	40
gallon	10.56688
gallon to liter:	
liter	40
gallon	151.4164
km to miles:	
km	400
miles	248.4
miles to km:	
miles	400
km	643.6

**2d) [20 points] – Compound Interest Calculator**

The formula for annual compound interest, including principal sum, is:

$$A = P (1 + r/n)^{(nt)}$$

Where:

A = the future value of the investment/loan, including interest

P = the principal investment amount (the initial deposit or loan amount)

r = the annual interest rate (decimal)

n = the number of times that interest is compounded per year

t = the number of years the money is invested or borrowed for

Assume you put \$120,000 into a bank. How much will your investment be worth after 15 years at an annual interest rate of 4% compounded quarterly? How much will be the total interest earned?

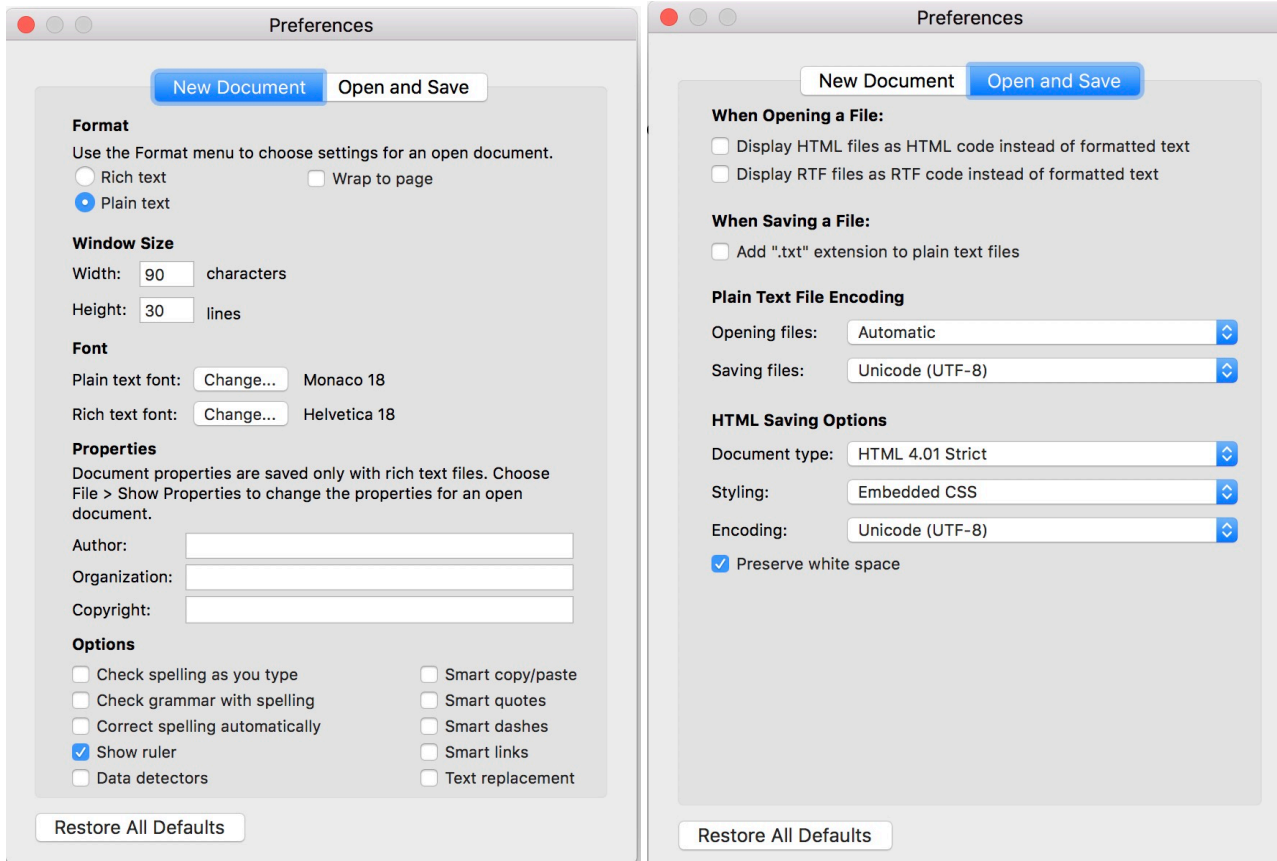
Principal	\$120,000
Annual Interest Rate	4%
Compounding Periods Per Year	4
Years	15
Amount Earned (A)	\$ 218,003.6
Total Interest Earned	\$ 98,003.6

Submit the document and spreadsheet via Canvas (as a single zip-file).

**This assignment is due by 6:00AM Saturday, September 8.**

## Additional Note for Mac Users:

The TextEdit app must be set up for plain text with no smart quotes to properly create and save a document that the compiler can read. Before starting, open preferences in TextEdit and make sure the settings match the following:



Also, make sure the **Format** menu shows **Make Rich Text** as its third item. If it says **Make Plain Text**, click it to set it to plain text mode.

