Exercise 1

Objectives

The goal of today's exercise is to review the steps from creating a program in Java to compiling and executing it.

A: Welcome to Java! [1 pt]

Your task is to create the simplest Java program: create a Java program source file and generate a class file named WelcomeJava.class.
*For this problem, just create a source file that can be compiled.

Submission Files	Types
`WelcomeJava.java`	`Java Class`

B: Hello World [1 pt]

Your task is to create a program that outputs the string "Hello World". The class name should be HelloWorld. Use the following template for this problem.

```
class HelloWorld{
    public static void main(String[] args){
       // your codes

    }
}
```

Standard output is essential for developing applications, but it is also essential for learning programming languages. This is because the values of variables are output to the screen in a timely manner to check the operation of a program while learning. To output strings to standard output, use the System.out.println() method.

To display character literals, enclose the relevant string in "(double quotation marks)".

```
System.out.println("hello");
```

Submission Files	Types
`HelloWorld.java`	`Java Class`

C: Fahrenheit to Celsius Converter [2 pt]

The Fahrenheit scale is the primary temperature standard in the USA. Please write a program converting Fahrenheit to the Celsius scale. The formula is as follows:

$$Celsius = (5 / 9) * (Fahrenheit - 32)$$

You can use the following template:

```
import java.util.Scanner;                    // API to use the Scanner object

class Fahrenheit{

   public static void main(String[] args){
      Scanner sc = new Scanner(System.in);  // A reference to a Scanner object
      int F = sc.nextInt();                 // read an integer from the std. input
      // you code

   }
}
```

To display the value of a variable, pass the variable to the println method as a argument. Here is an example.

```
double id = 3.14;
System.out.println(id);
```

Please check your solution by the following sample input and the corresponding output:

Sample Input	Sample Output
77	25.0
80	26.6667
91	32.7778
108	42.2222

Submission Files	Types
Fahrenheit.java	Java Class

D: Prime Factorize [2 pt]

Write a program to factorize a given integer n.

For the input, an integer n is given in a line.

For the output, print the given integer n and `':'`. Then, print prime factors in ascending order. If n is divisible by a prime factor several times, the prime factor should be printed according to the number of times. Print a space before each prime factor.

Please check your solution by the following sample input and the corresponding output:

Sample Input	Sample Output
12	12: 2 2 3
126	126: 2 3 3 7
1234567890	1234567890: 2 3 3 5 3607 3803
10000000000	10000000000: 2 2 2 2 2 2 2 2 2 2 5 5 5 5 5 5 5 5 5 5

Submission Files	Types
PrimeFactorizer.java	Java Class

Summary

In this exercise we reviewed the steps from creating a program in Java to compiling and executing it. We also saw how to output data to standard output by println and how to input data from standard input by the Scanner class. These details are omitted, but don't worry about them and use them as a black box for the time being.