**Welcome Notes**

* **Revise Material:** [**Algorithms, Fourth Edition**](https://d.docs.live.net/151e5a61d20ead7c/Cursos/Princeton%20University%20-%20Algorithms/Algorithms%5eJ%20Part%20I/Material/Algorithms%5eJ%20Fourth%20Edition.pdf) and [**Course Booksite**](https://algs4.cs.princeton.edu/home/).
* **Be an active participant:** write and debug code, solve problems, study available resources, engage into discussions.
* **Module 1 Material:** [**Introduction**](https://d.docs.live.net/151e5a61d20ead7c/Cursos/Princeton%20University%20-%20Algorithms/Algorithms%5eJ%20Part%20I/Material/Module%201/Introduction.pdf).

**Course Overview**

This is an intermediate-level course about programming and problem-solving using **algorithms** and **data structures**.

**Algorithm:** method for solving a problem.

**Data Structure:** method to store information.

For a professional, studying algorithms is essential for **intellectual stimulation**, **to become a proficient programmer**, **to solve problems that could not otherwise be addressed**, **to understand things**, etc.

**Introduction Assignment**

**Submission 1:** Write a program that outputs “Hello World”.

*public class HelloWorld{*

*public static void main(String args[]){*

*System.out.println("Hello World");*

*}*

*}*

**Notes:**

* Java programs need a class and a constructor method to run;
* **Public**: will be accessed by JVM (Java Virtual Machine);
* **Static:** can be executed without a class instance;
* **Void:** will not return value;
* **String args[]:** allows to pass command-line arguments.

Even if it will not be used, every Java program needs the ***String args[]*** signature.

**Submission 2:** Write a program that takes two names *(X and Y)* as **command-line arguments** and outputs “Hello X and Y | Goodbye Y and X”.

*public class HelloGoodbye {*

*public static void main(String[] args) {*

*String name\_one = args[0];*

*String name\_two = args[1];*

*String hello = String.format("Hello %s and %s.", name\_one, name\_two);*

*String goodbye = String.format("Goodbye %s and %s.", name\_two, name\_one);*

*System.out.println(hello);*

*System.out.println(goodbye);*

*}*

*}*

**Notes:**

* There are **format specifiers** for strings in Java;

|  |  |  |  |
| --- | --- | --- | --- |
| **Specifier** | **Meaning** | **Example** | **Result** |
| %s | String | “John” | John |
| %d | Integer | 25 | 25 |
| %f | Float | 3.1415 | 3.141500 |
| %.2f | Two decimal cases Float | 3.1415 | 3.14 |
| %n | Line break | - | - |

**Submission 3:** Write a program that reads a sequence of words and print one of those words randomly using **Knuth’s method**.

*import edu.princeton.cs.algs4.StdIn;*

*import edu.princeton.cs.algs4.StdOut;*

*import edu.princeton.cs.algs4.StdRandom;*

*public class RandomWord {*

*public static void main(String[] args) {*

*String champion = "";*

*int count = 0;*

*while (!StdIn.isEmpty()) {*

*String word = StdIn.readString();*

*count++;*

*if (StdRandom.bernoulli(1.0 / count)) {*

*champion = word;*

*}*

*}*

*StdOut.println(champion);*

*}*

*}*

**Notes:**

* **Knuth’s Method:** when reading the *ith* word, select it with probability 1 / *i* to be the champion, replacing the previous one.