# תכנית 1

## מיבוקט

**Lesson 1:** Introduction to Java

**Instructors:** Liore Shpiera and Ohad Bressi

**Course Title:** Programming Environment and Introduction to Java

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**Course Description:**
- **Language:** Hebrew
- **Prerequisites:**
  - Installation of a personal account on the university's computers
  - Directions for installation and Familiarity with the working environment on the course website.

## Java

### Course Overview:

- **Course Title:** Java
- **Language:** Hebrew
- **Language:** English
- **Objectives:**
  - Learning the basics of Java programming
  - Introduction to Java through an integrated development environment (IDE)

### Java Environment:

#### Java SE (Standard Edition) 5.0 update 13

- **Components:**
  - Java Virtual Machine (JVM)
  - Standard Class Library

#### Java Development Kit (JDK)

- **Components:**
  - JDK
  - Command line tools: compiler, debugger, etc.

#### Eclipse IDE

- **Features:**
  - Integrated development environment
  - Tools: editor, browser, compiler, debugger, etc.

#### Installation:

- **Operating Systems:** Windows, Linux
- **Download:**
  - Java SE 5.0 update 13
  - Eclipse IDE
  - Download instructions on the course website

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**Further Resources:**

- **Website:** http://courses.cs.tau.ac.il/software
- **Eclipse:** www.eclipse.org/eclipse
- **Java SE:** http://java.sun.com/javase

**Example:**

Develop and run a simple program "Hello World" in Eclipse.
Scope ( الحقوق )

Block = frame or "cell" in c++

The range of the variable defined within the block = block variables

```java
public static void main(String[] args) {
    int i = 1;
    {
        i++; // block in
        int i = 2; // block in
        int j = 2;
        System.out.println(i+j); // block end
    }
    i++; // block end
    System.out.println(j+1);
}
```

The main method:

- block in
- block end

Public class MyClass { }

```java
public static void main(String[] args) { }
```

Run...→Arguments→Program arguments : Eclipse

Output? 4 1 hello world

Value Range | Size | Type
---|---|---
long | 64 bits | beyond the scope of the discussion
int | 32 bits | -2^31 → 2^31 - 1
short | 16 bits | -2^15 → 2^15 - 1
byte | 8 bits | -128 → 127
double | 64 bits | most alphabet languages
float | 32 bits | true, false
char | 16 bits | beyond the scope of the discussion
boolean | 1 bit | true, false

type conversion

```java
public static void main(String[] args) {
    long l = 2000000000 + 2000000000;
    int i = (int) 1.99999999;
    float f = (float) 1.99999999;
    f = 5/2;
    f = (float) (5/2);
    f = 5 / (float) 2; // compilation error: cannot convert from int to short
    short a = 2;
    short c = a+2;
    System.out.println(l); // l == -294967296
    System.out.println(i); // i == 1
    System.out.println(f); // f == 2.5
    System.out.println(f == 2.5); // f == 2.5
}
```

Java API (Application Program Interface)

https://java.sun.com/j2se/1.5.0/docs/api/

STRING: "Hello World"

Non-primitive type

( Object )

Java documentation online:

Operators:
- "Hello " + " World" is "Hello World"
- "19" + 8 + 9 is "1989"

Examples of functions from the class String:
- http://java.sun.com/j2se/1.5.0/docs/api/java/lang/String.html

Here is a Java code snippet:
```java
public static void main(String[] args){
    String str1 = "Hello";
    char c = str1.charAt(0); // c == 'H'
    String str2 = str1.toUpperCase(); // str2 == "HELLO"
    int strLength = str1.length(); // i == 5

    // d == -1245.0
    // i == 1
}
```

Strings & Characters:
- Write a program that receives a character as an argument and prints:
  - The character received
  - The character following it
- Write a program that receives a character from the set {a,b,...,z} and prints its uppercase equivalent.

```
public static void main(String[] args){
    char c = args[0].charAt(0);
    System.out.println(c + 't' + (char)(((c + 'a') - 'a') + 'A'));
}
```

Solution A:
```java
public static void main(String[] args){
    System.out.println(args[0].toUpperCase());
}
```

Solution B:
```java
public static void main(String[] args){
    char c = args[0].charAt(0);
    System.out.println(Character.toUpperCase(c));
}
```

Solution C:
```java
```

Strings & Characters:
- Write a program that receives a character as an argument and prints:
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...