Java Basics - Part I

Course on Programming Basics

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Java Basics - I

Topics in Today's class

Basics of Computer Programming

Installation of Eclipse IDE and JDK

Variables

Data Types

Operators

Taking User Input

Conditional Statements

Basics of Computer Programming

Installation of Eclipse IDE and JDK

Eclipse Download link: https://www.eclipse.org/downloads/

Eclipse has its own Compiler, so no need to install JDK separately. Steps to get started with Eclipse.

1. Download and click on **Eclipse IDE for Java Developers** (first option in the list)
2. Keep default locations and settings, hit next and wait for the installation to finish. Then click Launch.
3. Create a New Java Project and start coding!

First Java Program

Every valid Java Application must have a class definition that matches the filename (class name and file name should be same).

The main method must be inside the class definition.

The compiler executes the codes starting from the main function.

```
public class HelloWorld {
    public static void main(String[] args) {
        // Write your code here
    }
}
```

Variables

A variable is a location in memory (storage area) to hold data.

To indicate the storage area, each variable should be given a unique name (identifier).

Rules for naming a variable

- Java is case sensitive. Hence, age and AGE are two different variables.
- Variables must start with either a letter or an underscore, _ or a dollar, $ sign. They cannot start with a number.
- Variable names can't use whitespace.
- If you choose one-word variable names, use all lowercase letters.

Data Types

8 Primitive Data Types

Data Type	Size	Description
`byte`	1 byte	Stores whole numbers from -128 to 127
`short`	2 bytes	Stores whole numbers from -32,768 to 32,767
`int`	4 bytes	Stores whole numbers from -2,147,483,648 to 2,147,483,647
`long`	8 bytes	Stores whole numbers from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
`float`	4 bytes	Stores fractional numbers. Sufficient for storing 6 to 7 decimal digits
`double`	8 bytes	Stores fractional numbers. Sufficient for storing 15 decimal digits
`boolean`	1 bit	Stores true or false values
`char`	2 bytes	Stores a single character/letter or ASCII values

Operators

Operators in Java can be classified into 5 types:

1. Arithmetic Operators
2. Assignment Operators
3. Relational Operators
4. Logical Operators
5. Unary Operators
6. Bitwise Operators

Input and Output

For Output

System.out.println();

System.out.print();

System.out.printf();

For Input

1. Import **Scanner** package
2. Create object of Scanner class
3. Use the object to take inputs.

we can use nextLong(), nextFloat(), nextDouble(), and next() methods to get long, float, double, and string input respectively from the user.

Java if Statements

In programming, we use the if..else statement to run a block of code among more than one alternatives.

```
if (condition) {
  // statements
}
```

Java if-else Statements

In programming, we use the if..else statement to run a block of code among more than one alternatives.

```
if (condition) {
  // codes in if block
}
else {
  // codes in else block
}
```

Java if-else if-else Statements

```
if (condition1) {
  // codes
}
else if(condition2) {
  // codes
}
else if (condition3) {
  // codes
}
.
.
else {
  // codes
}
```

Java switch statements

The switch statement allows us to execute a block of code among many alternatives.

```
switch (expression) {

  case value1:
    // code
    break;

  case value2:
    // code
    break;

  ...
  ...

  default:
    // default statements
  }
```

Break statements in switch-case

The break statement is used to terminate the switch-case statement. If break is not used, all the cases after the matching case are also executed.

Default statements in switch-case

The switch statement also includes an optional default case. It is executed when the expression doesn't match any of the cases. For example,

Practice Problems

1. Write a Java program that takes two numbers as input and display the product of two numbers.
2. Write a Java program to print the area and perimeter of a circle.
3. Write a Java program that reads a number in inches, converts it to meters.
4. Take three numbers from the user and print the greatest number.
5. Write a Java program that takes a year from user and print whether that year is a leap year or not.
6. Write a Java program to swap two numbers.
7. Write a Java program to grade students based on their marks.