JPL :: First Step Towards Programming

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Learning Objectives

- Write simple java programs by implementing rules
- Learn how to compile and Execute java file
- Understand importance of JVM
- Understand difference between source and class file
- Learn data types
- Declare and use variables

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Java Program to find the sum of four numbers

```java
public class SumExample {
    public static void main(String[] args) {
        int a1, a2, a3, a4;
        a1 = Integer.parseInt(args[0]);
        a2 = Integer.parseInt(args[1]);
        int sum = a1 + a2;
        a3 = Integer.parseInt(args[2]);
        sum = sum + a3;
        a4 = Integer.parseInt(args[3]);
        sum += a4;
        System.out.println("Sum: " + sum);
    }
}
```

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Working of a Java program
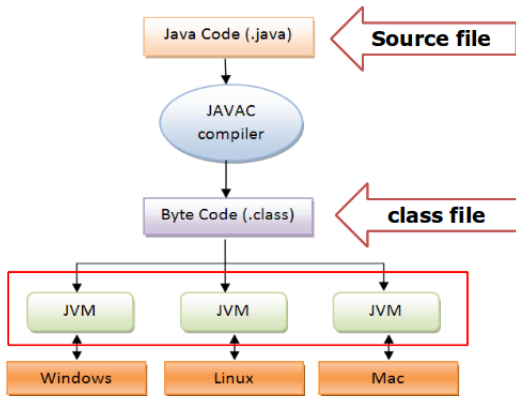
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JVM - Java Virtual Machine

- When we compile a Java file, output is a .**class** file but not an **.exe** file

- .**class** file consists of Java byte code which are understandable by JVM

- Java Virtual Machine interprets byte code into machine code depending upon the underlying operating system and hardware combination

- It is responsible for all the things like garbage collection, array bounds checking, etc...

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Naming conventions

- Package represents sub packages that contains group of classes and interfaces. Names of package in java are written lowercase letters

  `java.lang`   `java.io`   `java.util`

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Naming conventions

- Class is model for its objects. A class specifies properties and actions of objects. An interface is also similar to class. Each word of class name and interface name starts with a capital letter

```
String DataInputStreamReader
```

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- Class contain methods and variable. The first word of method name is in small letters; then from second word onwards, each new word should start with capital letter.
  read(), **getData()**, **viewEmployeeInfo()**
- Naming convention for variables names is same as that for methods
  salary, **empName**, **sumOfIntegers**

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- Constants represents fixed values that can not be altered. Such constants can be written by using all capital letters
  PI

- All keywords should be written by using all small letters
  public, **static**, **class**, **int**

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Write a Java program to add four numbers. Rewrite above program by using two variables.

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Solution

```java
public class SumExample2 {
    public static void main(String[] args) {
        int next, sumSoFar;
        next = Integer.parseInt(args[0]);
        sumSoFar = next;
        next = Integer.parseInt(args[1]);
        sumSoFar += next;
        next = Integer.parseInt(args[2]);
        sumSoFar += next;
        next = Integer.parseInt(args[3]);
        sumSoFar += next;
        System.out.println("Sum: " + sumSoFar);
    }
}
```

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Write a program to find the average of four numbers and then execute the program.
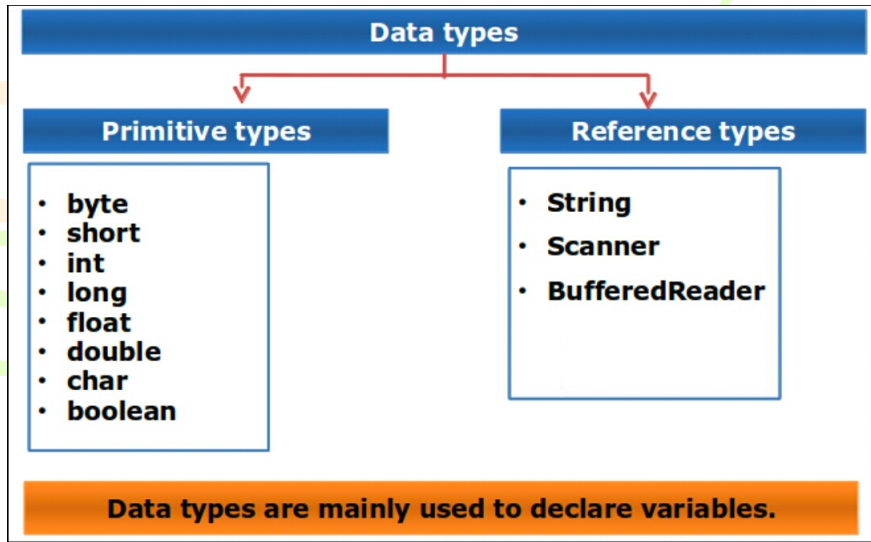
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Solution

```java
public class AvgExample {
    public static void main(String[] args) {
        int next, sumSoFar;
        next = Integer.parseInt(args[0]);
        sumSoFar = next;
        next = Integer.parseInt(args[1]);
        sumSoFar += next;
        next = Integer.parseInt(args[2]);
        sumSoFar += next;
        next = Integer.parseInt(args[3]);
        sumSoFar += next;
        System.out.println("Average: " + sumSoFar / 4);
    }
}
```
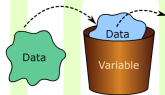
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Data types

Primitive types
- byte
- short
- int
- long
- float
- double
- char
- boolean

Reference types
- String
- Scanner
- BufferedReader

Data types are mainly used to declare variables.

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Variables

- Basic unit of storage
- Stores the data at the address pointed by it
- Value and operation on it are determined by its datatype

Variables are declared using primitive data types, such as **byte**, **short**, **int**, **long**, **float**, **double**, **char**, **boolean**, etc.

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Variable - Naming Conventions

- The name should convey the purpose of variable.
- All variable names must begin with an alphabet or with an underscore (_) or with a dollar sign ($)
  Good Practice: Begin with a lowercase letter.
- No spaces or special characters are allowed

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- Can contain more than one word joined without spaces - may be with underscore.
  Good Practice: Use sentence case for each word except the first.
- Java keywords (reserved words) are not allowed as variable names.

a, b, c, d, e... name

empName

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Variable - Declaration

The following is a way to declare a variable:

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