

Java - Introduction to Programming

Lecture 2

Variables & Data Types

1. Variables

A variable is a container (storage area) used to hold data. Each variable should be given a unique name (identifier).

```
package com.apnacollege;  
  
public class Main {  
  
    public static void main(String[] args) {  
        // Variables  
        String name = "Aman";  
        int age = 30;  
  
        String neighbour = "Akku";  
        String friend = neighbour;  
    }  
}
```

2. Data Types

Data types are declarations for variables. This determines the type and size of data associated with variables which is essential to know since different data types occupy different sizes of memory.

There are 2 types of Data Types :

- Primitive Data types : to store simple values
- Non-Primitive Data types : to store complex values

Primitive Data Types

These are the data types of fixed size.

Data Type	Meaning	Size (in Bytes)	Range
byte	2's complement integer	1	-128 to 127
short	2's complement integer	2	-32K to 32K
int	Integer numbers	4	-2B to 2B
long	2's complement integer (larger values)	8	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
float	Floating-point	4	Upto 7 decimal digits
double	Double Floating-point	8	Upto 16 decimal digits
char	Character	2	a, b, c .. A, B, C .. @, #, \$..
bool	Boolean	1	True, false

Non-Primitive Data Types

These are of variable size & are usually declared with a 'new' keyword.

Eg : String, Arrays

```
String name = new String("Aman");
int[] marks = new int[3];
marks[0] = 97;
marks[1] = 98;
marks[2] = 95;
```

3. Constants

A constant is a variable in Java which has a fixed value i.e. it cannot be assigned a different value once assigned.

```
package com.apnacollege;  
  
public class Main {  
  
    public static void main(String[] args) {  
        // Constants  
        final float PI = 3.14F;  
    }  
}
```

Homework Problems

1. Try to declare meaningful variables of each type. Eg – a variable named age should be a numeric type (int or float) not byte.
2. Make a program that takes the radius of a circle as input, calculates its radius and area and prints it as output to the user.
3. Make a program that prints the table of a number that is input by the user.

(HINT – You will have to write 10 lines for this but as we proceed in the course you will be studying about 'LOOPS' that will simplify your work A LOT!)

KEEP LEARNING & KEEP PRACTICING :)

1. print

```
System.out.print("≡");
```

2. println

```
System.out.println("≡");
```

next line

3. "\n"

A \n B

Data Types

```
graph TD; A[Data Types] --> B[Primitive]; A --> C[Non-Primitive]; B --> B1[byte]; B --> B2[short]; B --> B3[char]; B --> B4[boolean]; B --> B5[int]; B --> B6[long]; B --> B7[float]; B --> B8[double]; C --> C1[String]; C --> C2[Array]; C --> C3[Class]; C --> C4[Object]; C --> C5[Interface];
```

Primitive

byte
short
char
boolean
int
long
float
double

Non-Primitive

String
Array
Class
Object
Interface