



Fundamentals of Object Oriented Programming

CSN- 103

Dr. R. Balasubramanian

Associate Professor

Department of Computer Science and Engineering

Indian Institute of Technology Roorkee

Roorkee 247 667

balarfcs@iitr.ac.in

<https://sites.google.com/site/balaiiitr/>



Real Constants

\Rightarrow *Constant int $n=10$;*

- Integer constants are not able to represent quantities that vary continuously, such as distance, heights, temperature, price etc.
- These kinds of quantities are represented by real (or floating point) constants.

0.0083 -0.57 435.45

- Can be represented in terms of mantissa and exponent as

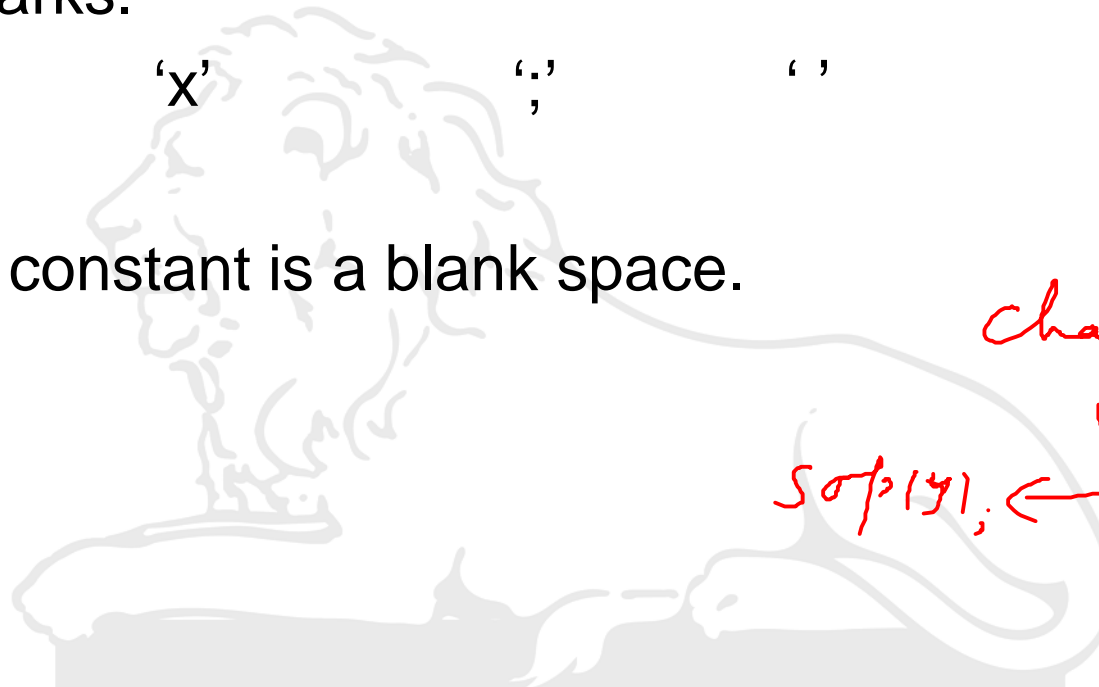
mantissa e exponent
0.65e4 12e-2 3.15E3

Single character constants:

- A single character constant (or simply character constant) contains a single character enclosed within a pair of single quote marks.

'5' 'x' '.' ' '

- The last constant is a blank space.



```
char y;  
y = '5';  
printf("%c", y);  
y = 'x';  
printf("%c", y);
```

String constants

- A string constant is a sequence of characters enclosed between double quotes. The characters may be alphabets, digits, special characters and blank spaces.

"Hello Java"

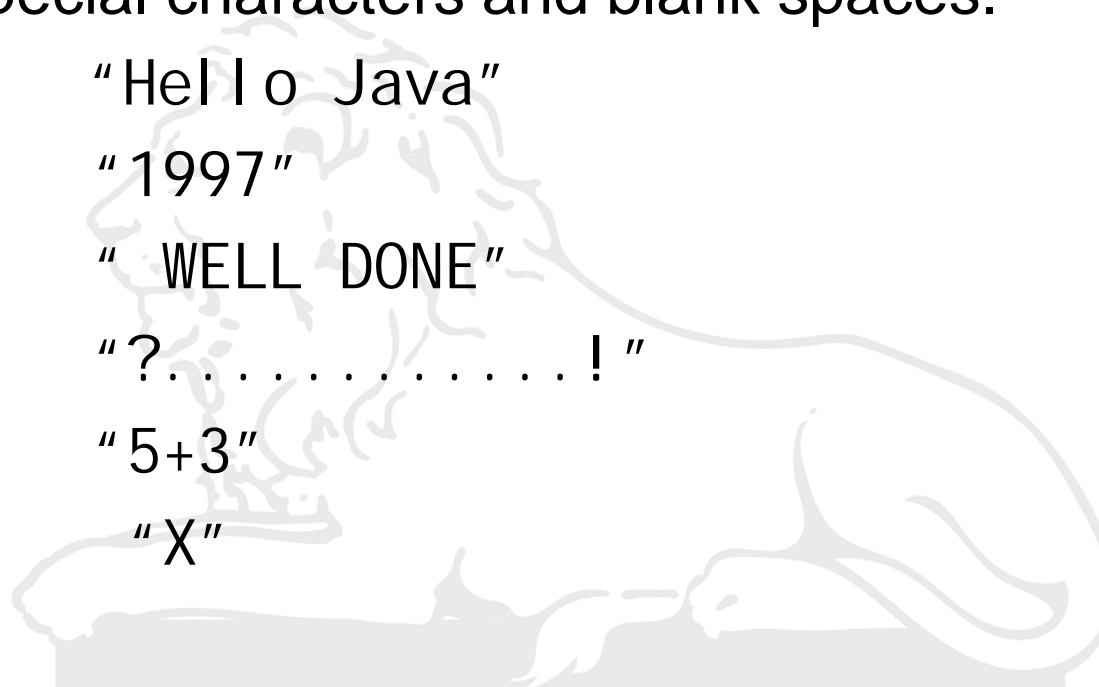
"1997"

"WELL DONE"

"?.....!"

"5+3"

"X"



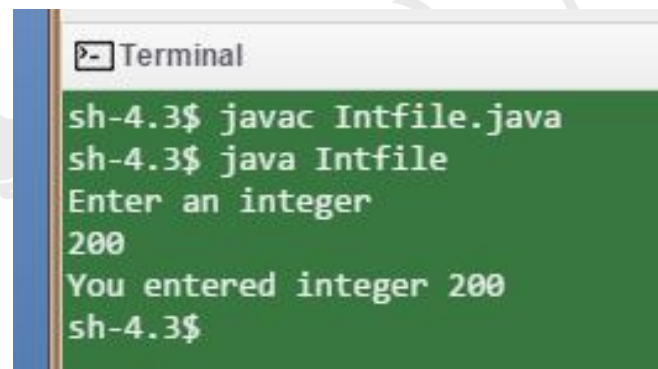
Integer Type

```
1 import java.util.Scanner;
2
3 class Intfile
4 {
5     public static void main(String args[])
6     {
7         int a;
8         float b;
9         String s=" ";
10
11         Scanner in = new Scanner(System.in);
12
13         System.out.println("Enter an integer");
14         a = in.nextInt();
15         System.out.println("You entered integer "+a);
16     }
17 }
```

// cin >> a;

- Output

<https://goo.gl/3NcKQN>



```
Terminal
sh-4.3$ javac Intfile.java
sh-4.3$ java Intfile
Enter an integer
200
You entered integer 200
sh-4.3$
```

Backslash character constants


- Java supports some special backslash constants that are used in output methods.

Constant	Meaning
'\b'	Back space
'\f'	Form feed
'\n'	New line
'\r'	Carriage return
'\t'	Horizontal tab
'\''	Single quote
'\"'	Double quote
'\\'	Backslash

- These characters combinations are known as *escape sequences*.

Backslash character constants

```
public class Escape {  
    public static void main(String[] args) {  
        System.out.println("Backspace : " + "ABCDE\bFGHI J");  
        System.out.println("Formfeed : " + "ABCDE\fFGHI J");  
        System.out.println("Linefeed : " + "ABCDE\nFGHI J");  
        System.out.println("Single Quote : " + "ABCDE\'FGHI J");  
        System.out.println("Double Quote : " + "ABCDE\"FGHI J");  
        System.out.println("Backslash : " + "ABCDE\\FGHI J");  
        System.out.println("Horizontal Tab : " + "ABCDE\tFGHI J");  
        System.out.println("Carriage Return: " + "ABCDE\rFGHI J");  
    }  
}
```

A faint, light-colored illustration of a statue, likely a deity or a historical figure, is visible in the background of the slide.

Output:

```
$ java Escape
Backspace      : ABCDFGHIJ
Formfeed       : ABCDE
                FGHIJ
Linefeed       : ABCDE
FGHIJ
Single Quote   : ABCDE'FGHIJ
Double Quote   : ABCDE"FGHIJ
Backslash      : ABCDE\FGHIJ
Horizontal Tab : ABCDE FGHIJ
FGHIJage Return: ABCDE
```




Variables

- A variable is an identifier that denotes a storage location used to store a data value.
- A variable may take different values at different times during the execution of the program.
- Variable names may consist of alphabets, digits, the underscore (_), and dollar characters, subject to the following conditions:
 - They must not begin with a digit
 - Uppercase and lowercase are distinct
 - It should not be a keyword
 - White space is not allowed
 - Variable names can be of any length

Some examples of Variable Names

- average
- height
- total_height
- classStrength



Data Types

- Every variable has a data type.
- Data types specify the size and type of values that can be stored.
- Built-in types and Derived types
- Built-in types are
 - Integer types
 - Floating point types
 - Character types
 - Boolean types

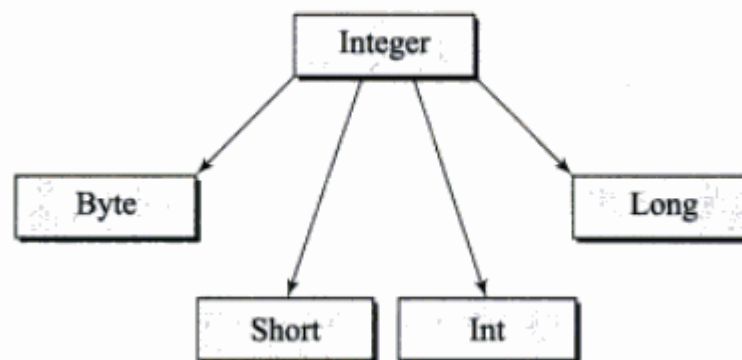
Integer Types

- Integer types can hold whole numbers such as 123, -96, 5639 etc.
- Java supports four types of integer types *byte*, *short*, *int*, and *long*.
- Java does not support the concept of *unsigned types* and therefore all Java values are signed (positive or negative).

Type	Size
byte	One byte
short	Two bytes
int	Four bytes
long	Eight bytes

Integer Types

Type	Min Value	Max Value
byte	-128	127
short	-32768	32767
int	-2,147,483,648	2,147,483,647
long	-9,223,372,036,854,775,808	9,223,372,036,854,775,807



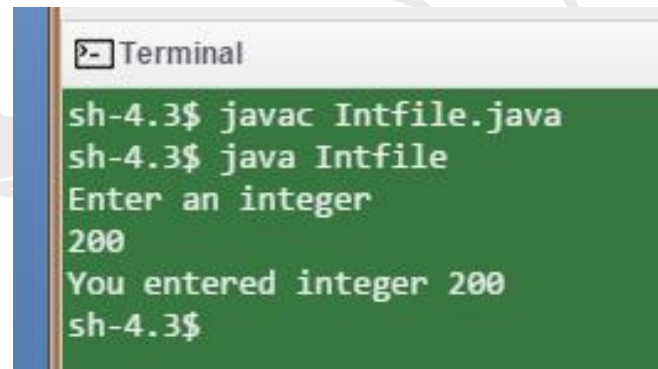
Integer Type

```
1 import java.util.Scanner;
2
3 class Intfile
4 {
5     public static void main(String args[])
6     {
7         int a;
8         float b;
9         String s=" ";
10
11         Scanner in = new Scanner(System.in);
12
13         System.out.println("Enter an integer");
14         a = in.nextInt();
15         System.out.println("You entered integer "+a);
16     }
17 }
```

// cin >> a;

- Output

<https://goo.gl/3NcKQN>



```
Terminal
sh-4.3$ javac Intfile.java
sh-4.3$ java Intfile
Enter an integer
200
You entered integer 200
sh-4.3$
```
