

Tender Heart High School, Sector-33 B, Chandigarh

CLASS: 10

SUBJECT: COMPUTER APPLICATION

TOPIC: values and Data Types

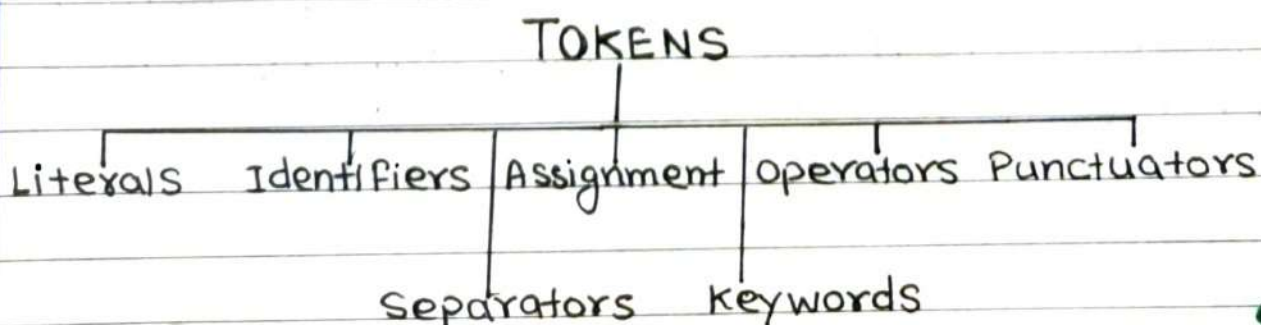
SUBJECT TEACHER: Prabhdeep Kaur

Good Morning

This lesson is of class 10 for the subject of Computer Application Topic values and Data Types. In our previous lesson we finished with Introduction and Concepts of Object Oriented Programming. Today we continue with the revision of class IX syllabus under which we do values and Data Types.

Program: Program is a set of instructions that can be executed by a computer to perform a specific task.

Token: Tokens are smallest elements of a program or we can say each statement of computer program is formed by using different words called 'Token'. Each token is formed by using valid characters of computer language in which program is written and which are meaningful to the compiler. The different types of tokens used in Java are:



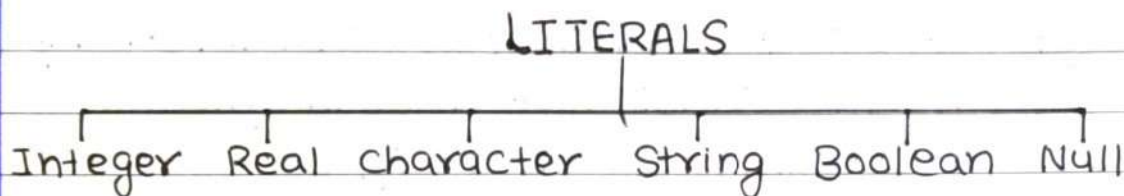
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• **Literals**: Literals are fixed values of boolean, numeric, character, or String data form that remain unchanged during entire execution of the program. The various types of literals used in Java are



Integer Literals: An integer literal is a numeric value or we can say the whole numbers positive or negative without any fractional or exponential part. There are 4 types of integer literals in Java

- * binary (base 2) eg: int binary number 10010
- * decimal (base 10) eg: int decnumber 34
- * Octal (base 8) eg: int Octalnumber 027
- * hexadecimal (base 16) eg: int hexadecimal 02F

Real Literals: A Real literals are also called Floating point literals. These are numeric literal that has either fractional form or an exponential form. The placement of decimal point may not be same in real numbers.

eg: Float = 3.42

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Character Literals: Character literals are unicode character that is either single letter, digit or any special symbol enclosed within single quote. It does not take part in arithmetical calculations

eg: `char letter = 'a';`

String literals: A string literal is a sequence of characters enclosed inside double-quotes.

eg: `String str = "Java Program"`

Boolean literals: Boolean literals are used to initialize boolean data types. They can store two values: true and false. A boolean literal can either be true or false at a time.

eg: `boolean flag = true;`

Null literals: Null literal denotes the absence of a value. It is used to initialize an object or array

eg: `String str = null;`

***Identifiers:** In programming languages identifiers are used for identification purposes. Identifiers can be a class name, method name, variable name or label

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Example:

```
Public class Test
{
    Public static void main (String[])
    {
        int a = 20;
    }
}
```

In this code, we have 5 identifiers

- * Test : Class name
- * main : method name
- * String : predefined class name
- * int : datatype
- * a : variable name

Rules for defining identifiers

- * The only allowed characters for identifiers are all alphanumeric character [A-Z, a-z, 0-9], \$(dollar sign) and '_' (underscore)
eg: greek@ - is invalid identifier as it contain special character@
- * Identifiers should not start with digits [0-9]
eg: 123test - is invalid
- * Java Identifiers are case-sensitive.
- * There is no limit on the length.

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* Reserved words cannot be used as an identifier

eg: `int while = 20` is invalid because while is reserved word. There are 53 reserved words in Java.

Assignment: An assignment designates a value for a variable. After a variable is declared, you can assign a value to it by using an assignment statement. We can say storing a value in a variable. In Java, the equal sign `=` is used as the assignment operator.

eg: `int a = 20;`

Now before going further let us take a short break. Answer the following questions during break

Q1. What is meant by boolean variable?

Q2. What are tokens in Java?

Q3. What does Null literal state?

You may pause the lesson for 3 minutes now and write the answers to above questions in notebook. Listen to correct answers

A1. Boolean variable is a variable that holds boolean value true or false.

A2. Token is a set of valid characters used for writing statement in program.

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A3: Null literal denotes the absence of a value

Operators: Operators are the Symbols or Signs used to specify the operations to be performed in a Java expressions or statement. Java divides the operators into the following groups:

Operators

Arithmetic operators Assignment operators comparison operators Logical operators Bitwise operators

Arithmetic Operators: are used to perform common mathematical operations.

operator	Name	Description	Example
+	Addition	Adds two values	$x + y$
-	Subtraction	Subtracts one value from another	$x - y$
*	Multiplication	Multiplies two values	$x * y$
/	Division	Divides one value by another	x / y
%	Modulus	Returns the division remainder	$x \% y$
++	increment	Increase the value of variable by 1	$++x$
--	Decrement	Decrease the value of a variable by 1	$--x$

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Assignment operators: are used to assign value to variable. **eg:** `int x = 10;` here assignment operator `=` use to assign the value 10 to a variable called x.

operators	Example	Same as
<code>=</code>	<code>x = 5</code>	<code>x = 5</code>
<code>+=</code>	<code>x += 5</code>	<code>x = x + 5</code>
<code>-=</code>	<code>x -= 5</code>	<code>x = x - 5</code>
<code>*=</code>	<code>x *= 5</code>	<code>x = x * 5</code>
<code>/=</code>	<code>x /= 5</code>	<code>x = x / 5</code>
<code>%=</code>	<code>x %= 5</code>	<code>x = x % 5</code>
<code>&=</code>	<code>x &= 5</code>	<code>x = x & 5</code>
<code>i=</code>	<code>x i= 5</code>	<code>x = x i 5</code>
<code>^=</code>	<code>x ^= 5</code>	<code>x = x ^ 5</code>
<code>>>=</code>	<code>x >>= 5</code>	<code>x = x >> 5</code>
<code><<=</code>	<code>x <<= 5</code>	<code>x = x << 5</code>

Comparison operators: are used to compare two values

Operator	Name	Example
<code>==</code>	Equal to	<code>x == y</code>
<code>!=</code>	Not equal	<code>x != y</code>
<code>></code>	Greater than	<code>x > y</code>
<code><</code>	Less than	<code>x < y</code>
<code>>=</code>	Greater than or equal to	<code>x >= y</code>
<code><=</code>	Less than or equal to	<code>x <= y</code>

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Logical operators: are used to determine the logic between variables or values:

Operator	Name	Description	Example
&&	Logical and	Returns true if both statements are true	$x < 5 \&\& x < 10$
	Logical or	Returns true if one of the statements is true	$x < 5 x < 4$
!	Logical not	Reverse the result, returns false if the result is true	$!(x < 5 \&\& x < 10)$

Punctuators: are the punctuation signs used as special characters. Some of the punctuators are comma(,), semicolons(;), dot(.) etc.

Separators: They are the special characters in Java, which are used to separate the variables or the characters. Comma(,), Brackets(), Curly brackets {}, Square brackets [] etc.

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Keywords: are the reserved words which are preserved by the system and carry special meaning for the system compiler. They have already been defined in the language and we cannot use them as names for variables or identifiers eg. class, public, for, system etc.

Answer the following questions:

Q1. What is a token? Name different types of tokens.

Q2. Define the following with example:

a. variable

b. boolean datatype

c. keywords

Q3. Define different types of literals?