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Object Oriented Programming JAVA

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LANGUAGE FUNDAMENTALS

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Language Fundamentals

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1. Identifiers
2. Reserved words
3. Data Types
4. Literals
5. Arrays
6. Type of Variables

4. Literals

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- A constant value which can be assigned to the variable is called “Literal”.

  Ex: int x = 10; // literal/constant value

Integral Literals:

1. decimal literal : allowed digits are 0 to 9

   int x = 139;

2. octal literal : - allowed digits are 0 to 7

   - literal values should be prefixed with ‘0’ (zero)

   int x = 0123;

3. hexa decimal literal : allowed digits are 0 to 9, A to F or a to f

   literal value should be prefixed with 0x or 0X (zero)

   int x1 = 0x123; int x1 = 0X123;

Examples

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Which of the following integral literal declarations are valid ?

- int x = 10; Y
- int x = 066; Y
- int x = 0786; N CE: integer number too large
- int x = 0xFACE; Y
- int x = 0XBEERS; N
- int x = 0xBEa; Y

Floating-point literals

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- By default ,every floating point literal is double. Hence we cant assign directly
- We write floating point literal with suffix f or F

Ex: float f=123.45; N

CE: possible loss of precision
Found: double
Required: float

float f=123.45f; Y

- Note: we can specify floating point literal only in decimal form and we cant specify in octal and hexa decimal form

Ex: double d=123.456; Y

double d=0123.456; Y

double d=0X123.456; N

CE: malformed floating point literal

Examples

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Which of the following floating point declarations are valid ?

- float f = 123.456; N

CE: possible loss of precision
Found: double
Required: float

- double d = 0123.456; Y
- double d = 0X123.456; N

CE: malformed floating point literal

- double d = 0XFACE; Y
- float f = 0XBEA; Y
- float f = 0642; Y

boolean Literal

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- Only allowed values are true/false.

Ex: boolean b=true; Y

boolean b=0; N

CE: Incompatible types
Found: int
Required: boolean

Char literal [1]

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- A char literal can be represented as single character with in single qotes

Ex: char x='a'; Y
char x=a; N
char x='ab'; N

- A char literal can be represented as integral literal (either in decimal form or octal form or hexadecimal form) but with in the range 0 to 65535

Ex: char ch=97; Y
char ch=65535; Y
char ch=0642; Y
char ch=65536; N

Char literal [2]

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- A char literal can be represented in unicode representation which is nothing but \uxxxx (4 digit hexadecimal number).

Ex: char ch='\u0061'; Y
char ch='\uface'; Y
char ch='\ibeaf'; N
ch\u0061r ch='b'; Y

- Every escape character is a char literal

Ex: char ch='\n'; Y
char ch='\t'; Y
char ch='\''; Y

Examples

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Which of the following char literals are valid ?

- char ch = 0Xbeaf; Y
- char ch = \ubeaf; N
- char ch = -10; N
- char ch = '*'; N
- char ch = '\a'; Y

String Literal

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- Collection of characters are called as a String, it should be in double qotes.

  Ex: String s="java";

- The following promotions will be performed automatically by the compiler.

  byte(1B)→short(2B)→int(4B)→long(8B)→float(4B)→double(8B)
  char(2B)↗

5. Arrays

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- What is an Array

  An array is an indexed collection of fixed no.of homogeneous data elements

- Advantage

  - We can represent the multiple values under the same name
  - Code readability is improved

- Limitation

  Once we created an array there is no chance of decreasing / increasing w.r.t size on our requirement.

Note: V.V.Imp: In the memory point of view arrays concept is not recommended to use.(we can resolve this problem using collections framework in java)

Array Declarations

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1. 1D array declarations

Ex:

```
int[] a;    Y
int  a[];   Y
int  []a;   Y
```

- At the time of declarations we cant specify the size, otherwise compile time error.

```
int[6]  a;    N
int  a[];     Y
```

2. 2D array declarations

Ex:

```
int  a[][];  Y

int  [][]a;  Y

int  []a[];  Y

int[][]  a;  Y

int[]  a[];  Y

int[]  []a;  Y
```

3. 3D array declarations

Ex:

```
int  a[][][];
int  [][][]a;
int  []a[][];
int  [][]a[];
int[][][]  a;
int[][]  []a;
int[][]  a[];
int[]  a[][];
int[]  [][]a;
int[]  []a[];
```

Above all are valid

Examples

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Which of the following are valid declarations ?

- int[] a,b; Y a → 1, b → 1
- int[] a[],b; Y a → 2, b → 1
- int[] []a,b; Y a → 2, b → 1
- int[] []a,b[]; Y a → 2, b → 2
- int[] []a,[]b; N

Note: if we want to specify the dimension before the variable, it is possible only for the first variable.