**Topic 3 : Working with Arrays.**

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**Array is a indexed collection of homogeneous data types.**

**It is fixed in size.**

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**The most standard way to declare an array is :**

**int[] i;**

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**Limitations of Array can be overcome by using Collections.**

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**We cannot set the size of the array while declaration.**

**int[5] a; //CE.**

**int[] a;**

**We compulsorily have to set the seize of the array while initialization.**

**int[] a = new int[]; //CE.**

**int[] a = new int[5];**

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**Which of the following are valid?**

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1. **Int[] a,b; //a = 1 , b = 1.**
2. **Int[] a[],b; //a = 2 , b = 1.**
3. **Int[] []a , b; //a = 2 , b = 2.**

**Compiler will not see blank space.**

1. **Int[] []a , []b; //CE.**

**We can use [] before variable only for the first one.**

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**Array construction :**

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**Every array in java is an Object.**

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**Following is the list of implementation classes :**

**(Using variableName. .getClass().getName())**

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**[B 🡪 byte[].**

**[S 🡪 short[].**

**[I 🡪 int[].**

**[[I 🡪 int[][].**

**[L 🡪 long[].**

**[F 🡪 float[].**

**[D 🡪 double[].**

**[C 🡪 char[].**

**[Z 🡪 Boolean[].**

**[L.java.lang.String 🡪 String[].**

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**Important rules :**

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1. **Int[] x = new int[];**

**We have to allocate space at the time of initialization itself.**

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1. **Int[] x = new int[0];**

**Compiles and even runs fine. We just can’t add any elements to it. For example in the main, the length of args is 0.**

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1. **Int[] x = new int[-3];**

**Compiles fine as it follows the syntax. But it will give an error , negative array index on runtime.**

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1. **Int[] x = new int[2147364847];**

**Compiles fine but will most likely get an error while running (MemoryOutOfBond). That will be a system problem not a java problem.**

1. **Int[] x = new int[‘a’];**

**We can use byte short char int instead of int as they’ll just implicitly convert into int by the compiler.**

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**Which of the following are valid?**

**1. int[] x = new int[]; //Invalid.**

**2. int[] x = new int[3]; //Valid.**

**3. int[][] x = new int[3][]; //Valid.**

**4. int[][] x = new int[3][4]; //Valid.**

**5. int[][] x = new int[][4]; //Invalid.**

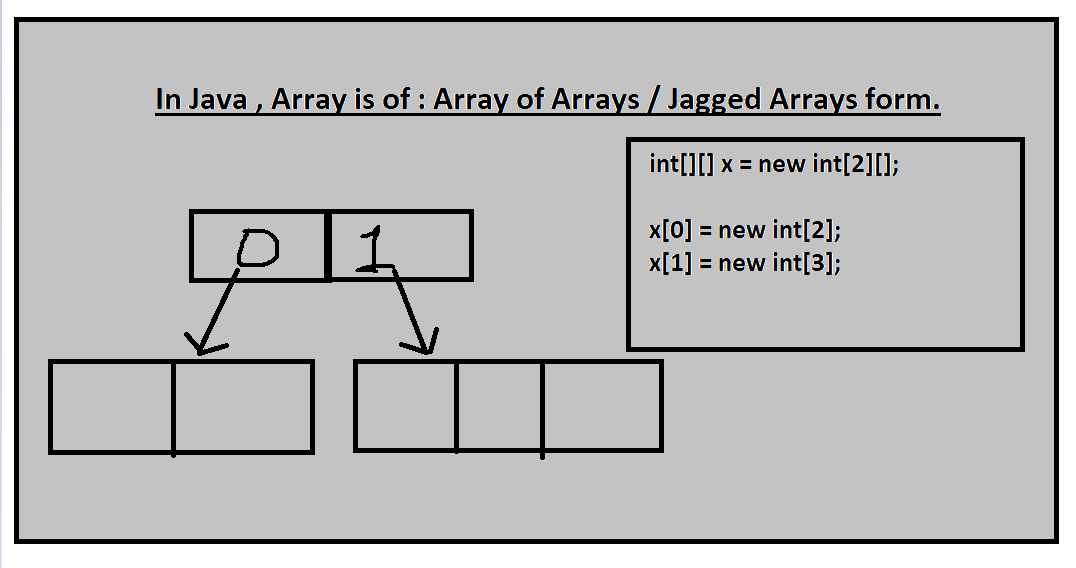
**6. int[][][] x = new int[3][][]; //Valid.**

**7. int[][][] x = new int[3][4][5]; //Valid.**

**8. int[][][] x = new int[3][][5]; //Invalid.**

**Multi dimensional Array :**

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**Array Initialization :**

**Int[] x = new int[3];**

**System.out.println(x); 🡪 [I@hashcode\_string.**

**System.out.println(x[0]); 🡪 0.**

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**Int[][] x = new int[3][2];**

**System.out.println(x); 🡪 [I@hascode\_string.**

**System.out.println(x[0]); 🡪 [I@hashcode\_string.**

**System.out.println(x[0][0]); 🡪 0.**

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**Int[][] x = new int[3][];**

**System.out.println(x); 🡪 [I@hashcode\_string.**

**System.out.println(x[0]); 🡪 null.**

**(As there is not specified size of the 2nd dimension , it’s object won’t be created the 1st dimension will be null).**

**System.out.println(x[0][0]); 🡪**

**RE : NullPointerException**

**(As , the value of x[0] that is 1st dimension is null , any operations performed on it will lead to NullPointerException).**

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**Int[] x = new int[4];**

**x[0] = 10; 🡪 Valid.**

**x[1] = 20; 🡪 Valid.**

**x[2] = 30; 🡪 Valid.**

**x[3] = 40; 🡪 Valid.**

**x[4] = 50; 🡪 Invalid.**

**RE : ArrayIndexOutOfBondException.**

**X[-4] = 60; 🡪 Invalid.**

**RE : ArrayIndexOutOfBondException.**

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**Question 1 :**

**public class test {**

**public static void main(String…args) {**

**//Line1**

**S[0] = “Bunny”;**

**S[1] = “Sunny”;**

**S[2] = “Chunny”;**

**System.out.println(S[0] + “-“ +**

**S[1] + “-“ +**

**S[2]);**

**}**

**}**

**For the above code. Choose correct option for line1.**

**a) String[] S = new String[3]; 🡪 Valid.**

**b) String S; S = String[3]; 🡪 Invalid.**

**c) String S = new String[3]; 🡪 Invalid.**

**d) String[3] S; 🡪 Invalid.**

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**Question 2 :**

**public class test {**

**public static void main(String…args) {**

**double[] d = new double[3];**

**int j = 3;**

**for(int i = 0; i > j; i++) {**

**d[i] = j;**

**}**

**for(double d1 : d) {**

**System.out.println(d1);**

**}**

**}**

**}**

**Which of the following is correct output?**

**a) 0.0,1.0,2.0,**

**b) 0.0,0.0,0.0,**

**c) Compilation fails.**

**d) ArrayOutOfBondsException.**

**🡪 b).**

**Question 3 :**

**public class Course {**

**String name; int fees;**

**Course(String name , int fees) {**

**this.name = name;**

**this.fees = fees;**

**}**

**public static void main(String…args) {**

**Course[] C = new Course[3];**

**C[0] = new Course(“Java” , 10000);**

**C[2] = new Course(“Python” , 20000);**

**for(Course c2 : C) {**

**out.println(c2.name+ “:” + c2.fees);**

**}**

**}**

**}**

**a) Java:10000 Python:20000 🡪 False.**

**b) Java:10000 null:0 Python:20000 🡪 False.**

**c) Compilation Exception. 🡪 False.**

**d) NullPointerException. 🡪 True.**

**Declaration , Creation and Initialization in single line.**

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**Int[] x = {10 , 20 , 30};**

**Int[][] x = { {10 , 20 , 30} , {40 , 50} };**

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**Question 5 :**

**public class test {**

**static int[] x;**

**public static void main(String…args) {**

**//Line1**

**}**

**}**

**Q) At Line1 which one is valid?**

**a) x = {10 , 20 , 30};**

**b) x = new int[3];**

**c) x = new int[3] {10 , 20 , 30};**

**d) x = new int[] {10 , 20 , 30};**

**🡪 b) , d).**

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**Length variable vs Length method :**

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**Int[] x = new int[3];**

**out.println(x.length); 🡪 Valid.**

**out.println(x.length()); 🡪 Invalid.**

**String s = “Gaurav”;**

**out.println(s.length); 🡪 Invalid.**

**out.println(s.length()); 🡪 Valid.**

**Length variable for Array.**

**Length method for String.**

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**Question 1 :**

**public class test {**

**public static void main(String…args) {**

**int[][] x = new int[6][3];**

**System.out.println(x.length);**

**}**

**}**

**What will be the output of the above code?**

**a) 6**

**b) 3**

**c) 9**

**d) 18**

**🡪 6.**

**Only base size is returned by arrays length variable.**

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**To get complete size of the array we have to manually type :**

**x[0].length+x[1].length+x[2].length…..**

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**Question 2 :**

**public class test {**

**public static void main(String…args) {**

**String[] s = {“a” , “aa” , “aaa”};**

**Line1.**

**}**

**}**

**Which of the following are valid declarations at line1?**

**a) System.out.println(s.length); 🡪 Valid.**

**o/p : 3.**

**b) System.out.println(s.length()); 🡪 Invalid.**

**o/p : CE.**

**c) System.out.println(s[0].length); 🡪 Invalid.**

**o/p : CE.**

**d) System.out.println(s[0].length()); 🡪 Valid.**

**o/p : 1.**

**Anonymous Arrays :**

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**Array without any name : Anonymous arrays.**