In this lab you will learn about

* Type-Casting, Arrays class and two dimensional array

# Programming Aims:

# Please use naming conventions in declaring a variable and/or class indent the code properly.

# Every file should contain author: your name, uob number, lab no, question no in comments.

# Type-Casting

Assigning a value of one type to a variable of another type is known as **Type Casting**.

In simple words type casting is a process of converting one type, which could be a class or interface to another, But as per rules of Java programming language, only classes or interfaces (collectively known as Type) from the same type hierarchy can be cast or converted into each other.

If you try to cast two objects which don’t share same type hierarchy, i.e. there is no parent-child relationship between them; you will get compile time error.

There are two kinds of type casting in java.

* Explicit Type-Casting
* Implicit Type-Casting

# Explicit Type-Casting

You will get a compilation error if you try to assign a **double** or float value to an **int** variable. This is because the fractional part would be lost. The compiler issues an error "possible loss in precision". For example,

*double d=3.5;*

*int i= d;*

To assign the a **double** value to an **int** variable, you need toinvoke the so-called type-casting operator - in the form of **(int)value** - to operate on the double operand and return a truncated value in **int**.

*double d=3.5;*

*int i=(int) d;*

Type-casting is an operation which takes one operand. It operates on its operand, and returns an equivalent value in the specified type.

# Implicit Type-Casting

Explicit type-casting is not required if you assign an int value to a double variable, because there is no loss of precision. The compiler will perform the type-casting automatically. For example

*int i=5;*

*double d;*

*d=i;*

# Arrays Class in java

The class **Arrays** contains various methods for manipulating arrays (such as sorting and searching). Explore more about this class on link below

<https://docs.oracle.com/javase/8/docs/api/java/util/Arrays.html>

# Declaring two dimensional Array in java

Syntax to declare a two dimensional array is

*Int [][] number=new int[5][5];// 2D integer array with 5 rows and 5 columns*

The first dimension is called number of rows while second is number of columns.

While declaring a two dimensional array, **specify first dimension**. For example following array declaration is illegal in Java.

*Int [][] number=new int[][];*

here are two ways to initialize a two dimensional array in Java, either by using array literal at the time of creation or by using nested for loop and going through each element. For example by using nested we can initialize array in the following way

*for(int i=0;i<row;i++)*

*{*

*for(int j=0;j<col;j++)*

*{*

*mumber[i][j]=value;*

*}*

*}*

# Exercises

# Exercise 1

Write a java program to print ASCII value of all characters of last your name.

# Exercise 2

**By use following array; solve problems given below.**

**double a=[12.0,32.4,33.5,11.0,43.9,5.5,6.5,22.0,3.2,1.3,21.0]**

By using Arrays class of Java

* Sort this array.
* Search 23 in the array.
* Store 100 on the first 4 indices of the array.
* Store 0 on the last index of the array.
* Copy the elements of this array into another array.

Suppose you also have another array of doubles. By using Arrays class of Java compare whether they are same or not (i.e. they have same elements or not)

# Exercise 3

A teacher issues three tests to a class of 10 students. The grades on these tests are integers in the range 0 to 100. Develop a system for teacher to keep record of each student’s grade and average, the average grade of each test and average of the class as a whole. Take grades of student as input and calculate each student’s average and the class average. If an input is invalid print error message and prompt the user to input the grade again.