**Utility Classes in Java**

**System**

**currentTimeMillis()**

The currentTimeMillis method returns the current time in terms of milliseconds since midnight, January 1, 1970. The currentTimeMillis method is to time how long various parts of your program take to execute .

import java.lang.\*;  
  
class Elapsed  
{  
    public static void main(String arg[])  
    {  
        long start, end;  
        System.out.println("Timing a for loop from 0 to 1000");  
        // time a for loop from o to 1000  
        start = System.currentTimeMillis(); // get time  
        System.out.println("Starting time in milliseconds : " + start);  
          
        for (int i = 0; i < 1000; i++)  // LINE A  
        {  
              
            for(int j =0; j < 2000; j++)  
            {  
                for( int k =0; k < 3000; k++)  
                {  
                      
                }  
            }  
        }  
        end = System.currentTimeMillis(); // get ending time  
        System.out.println("Ending time in milliseconds : " + end);  
        System.out.println("Elapsed time: " + (end - start)+ " ms"); // LINE B      
    }  
}

**Math Class**

Methods in Math class are used to perform basic operations such as the elementary exponential, logarithm, square root, and trigonometric functions.

import java.lang.Math;                      
  
class MathDemo  
{  
    public static void main(String arg[])  
    {  
        int num = 9;  
        if (Math.sqrt(num) \* Math.sqrt(num) == num) // LINE A  
            System.out.println(num + " is a perfect square");  
        else  
            System.out.println(num + " is not a perfect square");  
        num = -2;  
        System.out.println("Value of num : " + Math.abs(num)); // LINE B  
        System.out.println("value when Math.ceil is used : " + Math.ceil(Math.PI)); // LINE C  
        System.out.println("Value when Math.floor is used : " + Math.floor(Math.PI)); // LINE D  
        num = (int) (Math.random() \* 10); // LINE E  
        System.out.println("Random number between 0 and 10 : " + num);      
    }  
}

class NumberMethodTest2  
{  
    public static void main(String arg[])  
    {  
        Float b = 5.6f;  
        System.out.println("Converts to Positive Number : " + Math.abs(-7));  
        System.out.println("Smallest integer greater than b : " + Math.ceil(b));  
        System.out.println("Greatest integer less than b : " + Math.floor(b));  
        System.out.println("Closest integer as double : " + Math.rint(b));  
        System.out.println("Closest integer : " + Math.round(b));  
        System.out.println("Minimum of two numbers : " + Math.min(12.3, 9.6));  
        System.out.println("Maximum of two numbers : " + Math.max(8, 6));  
        System.out.println("e power 100 : " + Math.exp(100));  
        System.out.println("Log value : " + Math.log(2.7183));  
        System.out.println("2 Power 5 : " + Math.pow(2, 5));  
        System.out.println("Square root : " + Math.sqrt(81));      
    }  
}

class NumberMethodTest3  
{  
    public static void main(String arg[])  
    {  
        Double degree = 30.0;  
              
        System.out.println("sin(30) : " + Math.sin(Math.toRadians(degree)));  
        System.out.println("cos(30) : " + Math.cos(Math.toRadians(degree)));  
        System.out.println("tan(30) : " + Math.tan(Math.toRadians(degree)));  
        System.out.println("sec(30) : " + Math.asin(Math.toRadians(degree)));  
        System.out.println("cosec(30) : " + Math.acos(Math.toRadians(degree)));  
        System.out.println("cot(30) : " + Math.atan(Math.toRadians(degree)));  
        System.out.println("Theta of rectangle co-ordinate : " + Math.atan2(45,30));      
    }  
}

**Date class**

Date class is available in java.util package, it represents a specific instant of time, with millisecond precision. Date allows the interpretation of dates as year, month, day, hour, minute, and second values. It also allows the formatting and parsing of date strings.

import java.util.\*;  
  
class DateExampleTest  
{  
    public static void main(String arg[])  
    {  
        try  
        {  
            // Get current date and time  
            Date date = new Date(); // LINE A  
            System.out.println(date);  
            // Convert Date to String.  
            SimpleDateFormat dateFormat = new SimpleDateFormat("dd/MM/yyyy hh:mm:ss"); // LINE B  
            String stringDate = dateFormat.format(date); // LINE C  
            System.out.println(stringDate);  
            // Convert String to Date.  
            SimpleDateFormat df = new SimpleDateFormat("dd/MM/yyyy HH:mm:ss");  
            String dateInString = "15/08/1947 02:25:56";  
            date = df.parse(dateInString); // LINE D  
            System.out.println(date);  
        } catch (Exception e)  
        {  
            e.printStackTrace();  
        }      
    }  
}

**Calendar Class**

Calender is an abstract class. It provides a set of methods to manipulate the date and time. The subclass of calender class provides the specific implementation to the abstract methods defined by calender to meet their own requirements.

import java.util.Calendar;  
  
class ExampleOfDateAndTime  
{  
    public static void main(String arg[])  
    {  
        String months[] = {"JAN", "FEB", "MAR", "APR", "MAY", "JUNE", "JULY", "AUG", "SEPT", "OCT", "NOV", "DEC"};  
          
        /\*Create a calendar initialized with the  
        current date and time in the default  
        locale and timezone.\*/  
        Calendar cal = Calendar.getInstance();  
          
        //Display current time and date information.  
        System.out.println("Date :");  
        System.out.print(months[cal.get(java.util.Calendar.MONTH)]);  
        System.out.print(" " + cal.get(Calendar.DATE) + " ");// LINE D  
        System.out.println(cal.get(Calendar.YEAR));  
          
        System.out.println("Current Time: "); // LINE A  
        System.out.print(cal.get(Calendar.HOUR) + ":");  
        System.out.print(cal.get(Calendar.MINUTE) + ":");  
        System.out.println(cal.get(Calendar.SECOND));  
          
        //Set the time and date information and display it.  
        cal.set(Calendar.HOUR, 10); // LINE C  
        cal.set(Calendar.MINUTE, 29); // LINE C  
        cal.set(Calendar.SECOND, 22); // LINE C  
          
        System.out.println("Updated time"); // LINE B  
        System.out.print(cal.get(Calendar.HOUR) + ":");  
        System.out.print(cal.get(Calendar.MINUTE) + ":");  
        System.out.println(cal.get(Calendar.SECOND));  
      
    }  
}

**Timezone**

import java.util.\*;  
  
class TimeZoneDemo  
{  
    public static void main(String arg[])  
    {  
        Calendar now = Calendar.getInstance(); // LINE A   
        TimeZone timeZone = TimeZone.getTimeZone("IST"); // LINE B  
        System.out.println(timeZone.getDisplayName()); // LINE C  
        timeZone = TimeZone.getTimeZone("GMT");  
        now.setTimeZone(timeZone); // LINE D  
        System.out.println(timeZone.getDisplayName());  
      
    }  
}

**Locale**

import java.util.Locale;  
  
class LocaleDemo  
{  
    public static void main(String[] args)  
    {  
        Locale l = Locale.getDefault(); // LINE A  
        System.out.println(l);   
        System.out.println(l.getDisplayCountry()); // LINE B  
        System.out.println(l.getCountry()); // LINE C  
        System.out.println(l.getDisplayLanguage()); // LINE D  
        System.out.println(l.getLanguage()); // LINE E  
    }  
}

**Random**

import java.util.Random;  
  
class RandomTest  
{  
    public static void main(String arg[])  
    {  
        Random r = new Random();  
          
        System.out.println("The next Integer value : " + r.nextInt()); // LINE A  
        System.out.println("The next Boolean value : " + r.nextBoolean());  
          
        byte[] b = new byte[30];  
        r.nextBytes(b); // Puts the next byte in array  
        System.out.println("Value of Byte array : " + b);  
          
        System.out.println("The next Double value : " + r.nextDouble());  
        System.out.println("The next Float value : " + r.nextFloat());  
        System.out.println("The next Gaussian value : " + r.nextGaussian());  
        System.out.println("The next Integer  value between 0 to 4 : " + r.nextInt(5));  
        System.out.println("The next Long value : " + r.nextLong());  
        r.setSeed(20);  
        System.out.println("The set Seed value : " + r.nextInt());  
      
    }

**Scanner Class**

The Scanner class is a class in java.util package, which allows a user to read values of various types.

The Scanner looks for tokens in the input. A token is a series of characters that ends with whitespace. A whitespace character can be a blank, a tab character, a carriage return, or the end of the file.

For example, if we read a line that has a series of numbers separated by blanks, the scanner will take each number as a separate token.

**package** day\_19;

**import** java.io.File;

**import** java.io.FileNotFoundException;

**import** java.util.Scanner;

**public** **class** ScannerConstructorDemo1 {

**public** **static** **void** main(String arg[]) **throws** FileNotFoundException

{

// Read from a file rather than the keyboard

Scanner sc = **new** Scanner(**new** File("/Users/sabniss/Desktop/java-training/java-training/src/day\_19/ScannerConstructorDemo1.java")); // LINE A

// Check if sc has another token in the file

**while**(sc.hasNext())

System.***out***.println(sc.next());

// Close the scanner

sc.close();

}

}