DC- Expt-5

Program: **Berkley.java**

```
import java.io.*;
import java.util.*;
public class Berkley {
    float diff(int h, int m, int s, int nh, int nm, int ns) {
        int dh = h - nh;
        int dm = m - nm;
        int ds = s - ns;
        int diff = (dh * 60 * 60) + (dm * 60) + ds;
        return diff;
    }
    float average(float diff[], int n) {
        int sum = 0;
        for (int i = 0; i < n; i++)
            sum += diff[i];
        float average = (float) sum / (n + 1);
        System.out.println("The Average of all Time Differences is " + average);
        return average;
    }
    void sync(float diff[], int n, int h, int m, int s, int nh[], int nm[], int
ns[], float average) {
        for (int i = 0; i < n; i++) {
            diff[i] += average;
            int dh = (int) diff[i] / (60 * 60);
            diff[i] %= (60 * 60);
            int dm = (int) diff[i] / 60;
            diff[i] %= 60;
            int ds = (int) diff[i];
            nh[i] += dh;
            if (nh[i] > 23)
                nh[i] %= 24;
            nm[i] += dm;
            if (nm[i] > 59) {
                nh[i]++;
                nm[i] %= 60;
            }
            ns[i] += ds;
            if (ns[i] > 59) {
                nm[i]++;
                ns[i] %= 60;
            }
            if (ns[i] < 0) {
                nm[i]--;
                ns[i] += 60;
            }
        }
        h += (int) (average / (60 * 60));
        if (h > 23)
            h %= 24;
        m += (int) (average / (60 * 60 * 60));
        if (m > 59) {
            h++;
            m %= 60;
        }
        s += (int) (average % (60 * 60 * 60));
        if (s > 59) {
            m++;
            s %= 60;
        }
        if (s < 0) {
```

```
            m--;
            s += 60;
        }
        System.out.println("The Synchronized Clocks are:\nTime Server ---> " + h
+ ":" + m + " :" + s);
        for (int i = 0; i < n; i++)
            System.out.println("Node " + (i + 1) + " ---> " + nh[i] + " : " +
ns[i]);
    }
    public static void main(String[] args) throws IOException {
        Berkley b = new Berkley();
        Date date = new Date();
        BufferedReader obj = new BufferedReader(new
InputStreamReader(System.in));
        System.out.print("Enter Number of Nodes: ");
        int n = Integer.parseInt(obj.readLine());
        int h = date.getHours();
        int m = date.getMinutes();
        int s = date.getSeconds();
        int nh[] = new int[n];
        int nm[] = new int[n];
        int ns[] = new int[n];
        for (int i = 0; i < n; i++) {
            System.out.print("\nENTER TIME FOR NODE " + (i + 1) + "\nHOURS: ");
            nh[i] = Integer.parseInt(obj.readLine());
            System.out.print("MINUTES: ");
            nm[i] = Integer.parseInt(obj.readLine());
            System.out.print("SECONDS: ");
            ns[i] = Integer.parseInt(obj.readLine());
        }
        for (int i = 0; i < n; i++) {
            System.out.println("TIME SERVER SENT TIME" + h + ":" + m + ":" + s +
"TO NODE " + (i + 1));
        }
        float diff[] = new float[n];
        for (int i = 0; i < n; i++) {
            diff[i] = b.diff(h, m, s, nh[i], nm[i], ns[i]);
            System.out.println("NODE " + (i + 1) + " SENT TIME DIFFERENCE OF " +
(int) diff[i] + " TO TIME SERVER.");
        }
        float average = b.average(diff, n);
        b.sync(diff, n, h, m, s, nh, nm, ns, average);
    }
}
```

```
C:\Users\Moin MN\Downloads>javac Berkley.java
Note: Berkley.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.

C:\Users\Moin MN\Downloads>java Berkley
Enter Number of Nodes: 2

ENTER TIME FOR NODE 1
HOURS: 11
MINUTES: 45
SECONDS: 40

ENTER TIME FOR NODE 2
HOURS: 11
MINUTES: 41
SECONDS: 20
TIME SERVER SENT TIME15:33:4TO NODE 1
TIME SERVER SENT TIME15:33:4TO NODE 2
NODE 1 SENT TIME DIFFERENCE OF 13644 TO TIME SERVER.
NODE 2 SENT TIME DIFFERENCE OF 13904 TO TIME SERVER.
The Average of all Time Differences is 9182.667
The Synchronized Clocks are:
Time Server ---> 17:34 :6
Node 1 ---> 18 : 6
Node 2 ---> 18 : 6
```