**Exp No.9**

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**Batch: C23**

**Code:**

**Exp9DSSS.java :**

import java.util.Arrays;

public class Exp9DSSS {

public static void main(String[] args) {

// Original data signal (binary representation)

// System.out.print("Enter the length of data signal: ");

int[] dataSignal = { 0, 1 };

// Spreading code (PN sequence) Barker's code

int[] spreadingCode = { 1, 0, 1, 1, 0, 1, 1, 1, 0, 0, 0 };

// Spread the data signal using DSSS

int[] spreadSignal = spreadDSSS(dataSignal, spreadingCode);

// Display the results

System.out.println("Original Data Signal: " + Arrays.toString(dataSignal));

System.out.println("Spreading Code (PN Sequence): " + Arrays.toString(spreadingCode));

System.out.println("Spread Signal: " + Arrays.toString(spreadSignal));

// Recover the original signal by despread

int[] recoveredSignal = despreadDSSS(spreadSignal, spreadingCode);

// Display the recovered signal

System.out.println("Recovered Signal: " + Arrays.toString(recoveredSignal));

}

private static int[] spreadDSSS(int[] dataSignal, int[] spreadingCode) {

int[] spreadSignal = new int[dataSignal.length \* spreadingCode.length];

for (int i = 0; i < dataSignal.length; i++) {

for (int j = 0; j < spreadingCode.length; j++) {

spreadSignal[i \* spreadingCode.length + j] = dataSignal[i] ^ spreadingCode[j];

}

}

return spreadSignal;

}

private static int[] despreadDSSS(int[] spreadSignal, int[] spreadingCode) {

int length = spreadSignal.length / spreadingCode.length;

int[] recoveredSignal = new int[length];

for (int i = 0; i < length; i++) {

int sum = 0;

for (int j = 0; j < spreadingCode.length; j++) {

sum += spreadSignal[i \* spreadingCode.length + j] ^ spreadingCode[j];

}

System.out.print("Addition of " + " bit " + (i + 1) + " : " + sum);

recoveredSignal[i] = (sum > 7) ? 1 : 0;

if (sum > 7) {

System.out.println(", Since sum is more than 7, it is converted to 1");

} else

System.out.println(", Since sum is less than 4, it is converted to 0");

}

return recoveredSignal;

}

}

**Output:**

(base) PS C:\Users\Rishab\OneDrive\Desktop\MCC Exp Documents> cd "c:\Users\Rishab\OneDrive\Desktop\MCC Exp Documents\" ; if ($?) { javac Exp9DSSS.java } ; if ($?) { java Exp9DSSS }

Original Data Signal: [0, 1]

Spreading Code (PN Sequence): [1, 0, 1, 1, 0, 1, 1, 1, 0, 0, 0]

Spread Signal: [1, 0, 1, 1, 0, 1, 1, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 1, 1, 1]

Addition of bit 1 : 0, Since sum is less than 4, it is converted to 0

Addition of bit 2 : 11, Since sum is more than 7, it is converted to 1

Recovered Signal: [0, 1]

(base) PS C:\Users\Rishab\OneDrive\Desktop\MCC Exp Documents>