GOA COLLEGE OF ENGINEERING

"Bhausaheb Bandodkar Technical Education Complex"

Experiment No: 3

CDMA

Aim: To write and execute a program implementing Code Division Multiple Access.

Theory:

CDMA, which stands for Code Division Multiple Access, is a competing cell phone service technology to GSM on older networks that are gradually phasing out. In 2010, carriers worldwide switched to LTE, a 4G network that supports simultaneous voice and data use. CDMA uses a "spread-spectrum" technique whereby electromagnetic energy is spread to allow for a signal with a wider bandwidth. This approach allows several people on different cell phones to be "multiplexed" over the same channel to share a bandwidth of frequencies. With CDMA technology, data and voice packets are separated using codes and then transmitted using a wide frequency range. Since more space is often allocated for data with CDMA, this standard became attractive for high-speed mobile Internet use. While CDMA and GSM compete head-on in terms of higher bandwidth speed, GSM of- fers more complete global coverage thanks to roaming and international-roaming contracts. GSM technology tends to cover rural areas in the U.S. more completely than CDMA. Most CDMA networks do not allow voice and data transmissions at the same time. This is why you may get bombarded with emails and other Internet notifications when you end a call from a CDMA network like Verizon.

Code:

```
#include <iostream>
using namespace std;
int main() {

  int Ad, Bd, Ak[10], Bk[10], As[10], Bs[10], C[10];
  cout << "Enter the value" << endl;
  cin >> Ad >> Bd;
  if (Ad == 0) {

    Ad = -1;
  } else {

Ad = 1; }

if (Bd == 0) {

Bd = -1;
} else {

Bd = 1; }

cout << "enter the key values" << endl;
```

```
int i;
for (i = 0; i < 6; i++) {

  cin >> Ak[i] >> Bk[i];
}

for (i = 0; i < 6; i++) {
  if (Ak[i] == 0) {

    Ak[i] = -1;
  } else {

Ak[i] = 1; }

  if (Bk[i] == 0) {
    Bk[i] = -1;

  } else {
    Bk[i] = 1;

} }

for (int j = 0; j < 6; j++) {
  As[j] = Ad * Ak[j];

}
for (int x = 0; x < 6; x++) {

  Bs[x] = Bd * Bk[x];
}

for (int k = 0; k < 6; k++) {
  C[k] = As[k] + (5 * Bs[k]);

}
cout << "A key converted to -1 and +1 " << endl;
for (int j = 0; j < 6; j++) {

  cout << Ak[j] << " ";
}

cout << endl;
cout << "B key converted to -1 and +1 " << endl;
for (int j = 0; j < 6; j++) {

  cout << Bk[j] << " ";
```

```
}

cout << endl;
cout << "A Signal" << endl;
for (int j = 0; j < 6; j++) {

  cout << As[j] << " ";
}

cout << endl;
cout << "B Signal" << endl;
for (int j = 0; j < 6; j++) {

cout << Bs[j] << " ";

  }

  cout << endl;
  cout << "C Merged Signal" << endl;
  for (int j = 0; j < 6; j++) {

    cout << C[j] << " ";
  }

  cout << endl;
  cout << "The Data at the receiver side A" << endl;
  int firTotal = 0;
  for (int p = 0; p < 6; p++) {

    firTotal = firTotal + C[p] * Ak[p];
  }

  cout << firTotal << endl;
  cout << "The Data at the receiver side B" << endl;
  int SecTotal = 0;
  for (int p = 0; p < 6; p++) {

    SecTotal = SecTotal + C[p] * Bk[p];
  }

  cout << SecTotal << endl;
  cout << "RECEIVER Side Data A" << endl;
  if ((firTotal <= 1) && (firTotal >= (-1))) {

    cout << "It is a noise" << endl;
```

```
  } else if (firTotal < -1) {
    cout << "Data is 0" << endl;

  } else {
    cout << "Data is 1" << endl;

  }
  cout << "RECEIVER Side Data B" << endl;
  if ((SecTotal <= 1) && (SecTotal >= (-1))) {

    cout << "It is a noise" << endl;

  } else if (SecTotal < -1) {
    cout << "Data is 0" << endl;

  } else {
    cout << "Data is 1" << endl;

} }
```

Output:

```
$ c cdma.cpp
Enter the value
10
enter the key values 011100

011011
A key converted to -1 and +1
-1 1 -1 -1 1 1
B key converted to -1 and +1
1 1 -1 1 -1 1
A Signal
-1 1 -1 -1 1 1
B Signal
-1 -1 1 -1 1 -1
C Merged Signal
-6 -4 4 -6 6 -4
The Data at the receiver side A 6
The Data at the receiver side B -30
RECEIVER Side Data A
Data is 1
RECEIVER Side Data B
Data is 0
```

Conclusion: A program to implement Code Division Multiple Access(CDMA) was successfully written and executed.