CDMA Single

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C.Sys

1) **Functions :**

```
void mulDK (int  d , int k[1000] , int Ks, int ss[1000])
```
Take data and multiply it with key and save result return in ss array .

```
void mulEK (int  d[1000] , int k[1000] , int Ks, int ss[1000])
```
Take array of data and multiply it with array of key and save result return in ss array .

```
void sumAB (int x , int A[1000] , int B[1000] , int AB[1000])
```
Take to arrays and sum them in one array .

```
int sumX(int x , int X[1000])
```
Take array and sum the first x element in it.

```
void assign (string S , int s0 , int s1 , int SS[1000])
```
Take string and mapped it with value of 0 and 1 and return result in SS array.

```
void printarr(int x , int X[1000])
```
to print array on console to test .

```
int main ()
```
the main function take input from user and use above function to solve CDMA.

2) Example :

Theoretical Example explains Basic Function of CDMA

- Sender A
  - sends A_d = 1, key A_k = 010011 (assign: "0"= -1, "1"= +1)
  - sending signal $A_s = A_d * A_k$ = (-1, +1, -1, -1, +1, +1)
- Sender B
  - sends B_d = 0, key B_k = 110101 (assign: "0"= -1, "1"= +1)
  - sending signal $B_s = B_d * B_k$ = (-1, -1, +1, -1, +1, -1)
- Both signals superimpose in space
  - interference neglected (noise etc.)
  - $A_s + B_s$ = (-2, 0, 0, -2, +2, 0)
- Receiver wants to receive signal from sender A
  - apply key A_k bitwise (inner product)
    - A_e = (-2, 0, 0, -2, +2, 0) • A_k = 2 + 0 + 0 + 2 + 2 + 0 = 6
    - result greater than 0, therefore, original bit was "1"
  - receiving B
    - B_e = (-2, 0, 0, -2, +2, 0) • B_k = -2 + 0 + 0 - 2 - 2 + 0 = -6, i.e. "0"