

LAB 2

2019F_ESE 3014_1

LAB 2

GROUP 16 -

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```
>> A = [1 1 1 1 1 1 1 1; -1 -1 -1 -1 1 1 1 1; -1 -1 1 1 1 1 -1 -1; 1 1 -1 -1 1 1 -1 -1; 1 -1 -1 1 1 -1 -1 1; -1 1 1 -1 -1 1 1 -1; -1 1 -1 1 1 -1 1 -1; 1 -1 1 -1 1 -1 1 -1] %inputting the Walsh matrix
```

```
A =
```

```
1 1 1 1 1 1 1 1
-1 -1 -1 -1 1 1 1 1
-1 -1 1 1 1 1 -1 -1
1 1 -1 -1 1 1 -1 -1
1 -1 -1 1 1 -1 -1 1
-1 1 1 -1 1 -1 -1 1
-1 1 -1 1 1 -1 1 -1
1 -1 1 -1 1 -1 1 -1
```

```
>> usr1 = [1 1 1 1 1 1 1 1] %user 1 chooses line 1
```

```
usr1 =
```

```
1 1 1 1 1 1 1 1
```

```
>> usr2 = [-1 -1 -1 -1 1 1 1 1] %user 2 chooses line 2
```

```
usr2 =
```

```
-1 -1 -1 -1 1 1 1 1
```

```
>> usr3 = [-1 -1 1 1 1 1 -1 -1] %user 3 chooses line 3
```

```
usr3 =
```

```
-1 -1 1 1 1 1 -1 -1
```

```
>> usr1info = 110; %information of user 1
```

```
>> usr2info = 010; %information of user 2
```

```
>> usr3info = 100; %information of user 3
```

```
>> zero = zeros(1,8) %providing a row zeroes for encoding process
```

```
zero =
```

```
0 0 0 0 0 0 0 0
```

```
>> usr1enc = [usr1 ; usr1 ; zero] %encoding message of user1
```

```
usr1enc =
```

```
1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1
0 0 0 0 0 0 0 0
```

```
>> usr2enc = [zero ; usr2 ; zero]%encoding message of user2
usr2enc =
```

```
0 0 0 0 0 0 0 0
-1 -1 -1 -1 1 1 1 1
0 0 0 0 0 0 0 0
```

```
>> usr3enc = [usr3 ; zero ; zero]%encoding message of user3
usr3enc =
```

```
-1 -1 1 1 1 1 -1 -1
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
```

```
>> combmesg = usr1enc + usr2enc + usr3enc%combining the three messages
combmesg =
```

```
0 0 2 2 2 2 0 0
0 0 0 0 2 2 2 2
0 0 0 0 0 0 0 0
```

```
>> M = 8; %size of Walsh's matrix
```

```
>> usr1dec = combmesg .* usr1%decoding the encoded message of user 1
usr1dec =
```

```
0 0 2 2 2 2 0 0
0 0 0 0 2 2 2 2
0 0 0 0 0 0 0 0
```

```
>> usr1dec_1 = sum(d,2)%decoding the encoded message of user 1 continued
usr1dec_1 =
```

```
8
8
0
```

```
>> decdmesg1 = (usr1dec_1/M) '%decoded message of user 1 (message of user 1 = 110)'
decdmesg1 =
```

```
1 1 0
```

```
>> decdmesg1 = (usr1dec_1/M) '
decdmesg1 =
```

```
1 1 0
```

```
>> usr2dec = combmesg .* usr2%decoding the encoded message of user 2
usr2dec =
```

```
-0 -0 -2 -2 2 2 0 0
-0 -0 -0 -0 2 2 2 2
-0 -0 -0 -0 0 0 0 0
```

```
>> usr2dec_2 = sum(usr2dec,2) %decoding the encoded message of user 2 continued
usr2dec_2 =
```

```
0
8
0
```

```
>> decdmesg2 = (usr2dec_2/M)' %decoded message of user 2 (message of user 2 = 010)
decdmesg2 =
```

```
0 1 0
```

```
>> decdmesg2 = (usr2dec_2/M) '
decdmesg2 =
    0    1    0
```

```
>> usr3dec = combmesg.*usr3 %decoding the encoded message of user 3
usr3dec =
```

```
-0 -0 2 2 2 2 -0 -0
-0 -0 0 0 2 2 -2 -2
-0 -0 0 0 0 0 -0 -0
```

```
>> usr3dec_3 = sum(usr3dec,2) %decoding the encoded message of user 2 continued
usr3dec_3 =
```

```
8
0
0
```

```
>> decdmesg3 = (usr3dec_3/M)' %decoded message of user 3 (message of user 3 = 100)
decdmesg3 =
```

```
1 0 0
```

```
>> decdmesg3 = (usr3dec_3/M) '
decdmesg3 =
    1    0    0
```