American International University- Bangladesh
Department of Computer Science

Lab Report Cover Sheet

Course Name	Data Communication
Lab Report No.	04
Lecturer Name	Md. Navid Bin Anwar
Semester	Fall 2020-21
Submission Date	07-11-2012
Section	B
Group No.	10

Student Name	**Student ID**	**Contribution (out of 100%)**
1. Tanvir Ahamed	18-37519-1	20%
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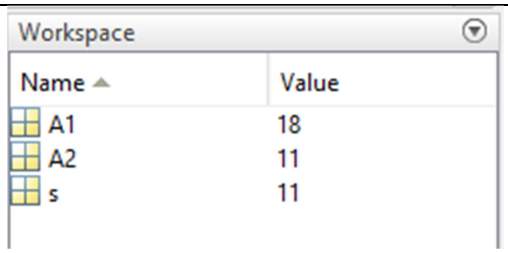
3. MD. Sibbir Hossain	18-38828-3	20%
4. Fahim Mahtab	18-38626-2	20%
5. Kaif Al Kabid	18-38144-2	20%
Lecturer Remarks (Only for teacher)		

My ID :18-37519-1

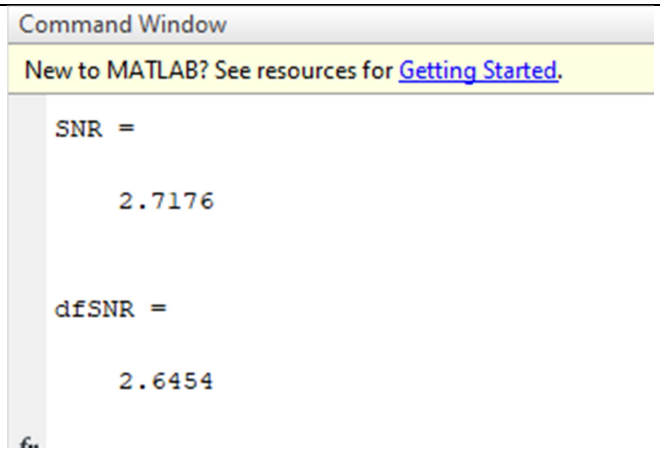
a)

```
A1=18;
A2=11;
s=11;
```



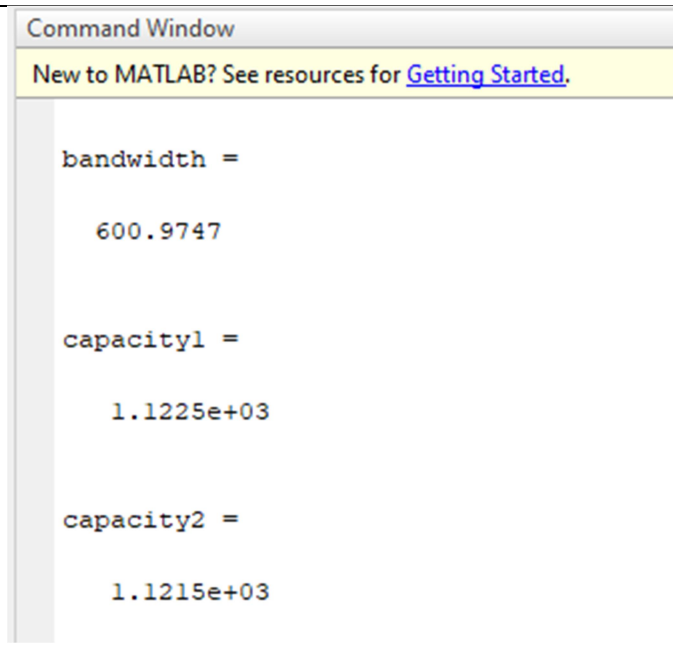
b)

```
A1=18;
A2=11;
s=11;
fs=40000;
t = 0:1/fs:1-1/fs;
powfund=(A1^2)/2+(A2^2)/2;
varnoise=s^2;
C=3;
G=9;
signal = A1*sin(2*pi*(C*100)*t) +
2*cos(2*pi*(G*100)*t);
noise=  s*randn(size(t));
SNR=snr(signal,noise)
dfSNR=10*log10(powfund/varnoise)
```



c)

```
A1=18;
A2=11;
s=11;
fs=40000;
t = 0:1/fs:1-1/fs;
powfund=(A1^2)/2+(A2^2)/2;
varnoise=s^2;
C=3;
G=9;
signal = A1*sin(2*pi*(C*100)*t) +
A2*cos(2*pi*(G*100)*t);
noise=  s*randn(size(t));
SNR=snr(signal,noise);
dfSNR=10*log10(powfund/varnoise);
bandwidth = obw(signal,fs)
capacity1=bandwidth*log2(1+SNR)
capacity2=bandwidth*log2(1+dfSNR)
```



d)

```
A1=18;
A2=11;
s=11;
fs=40000;
t = 0:1/fs:1-1/fs;
powfund=(A1^2)/2+(A2^2)/2;
varnoise=s^2;
C=3;
G=9;
signal = A1*sin(2*pi*(C*100)*t) +
A2*cos(2*pi*(G*100)*t);
noise=  s*randn(size(t));
SNR=snr(signal,noise);
dfSNR=10*log10(powfund/varnoise);
bandwidth = obw(signal,fs);
capacity1=bandwidth*log2(1+SNR);
capacity2=bandwidth*log2(1+dfSNR);
apprxDataRate1=floor(bandwidth*log2(1+SNR));
apprxDataRate2=floor(bandwidth*log2(1+dfSNR));
level1=floor(2^(apprxDataRate1/(2*bandwidth)))
level2=floor(2^(apprxDataRate2/(2*bandwidth)))
```