CommLab6

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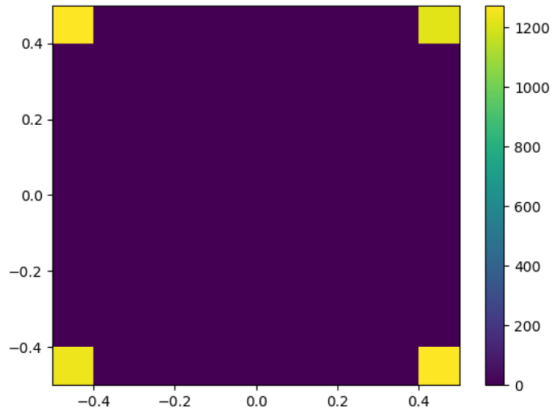
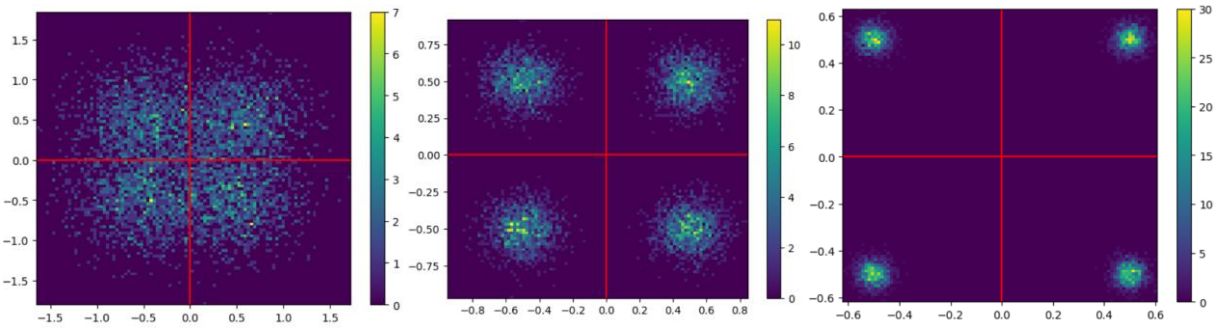
2.a Histogram of sequence:



After noise: Eb/N_0 = 0, 10, 20 dB. The decision regions are marked by the red lines.



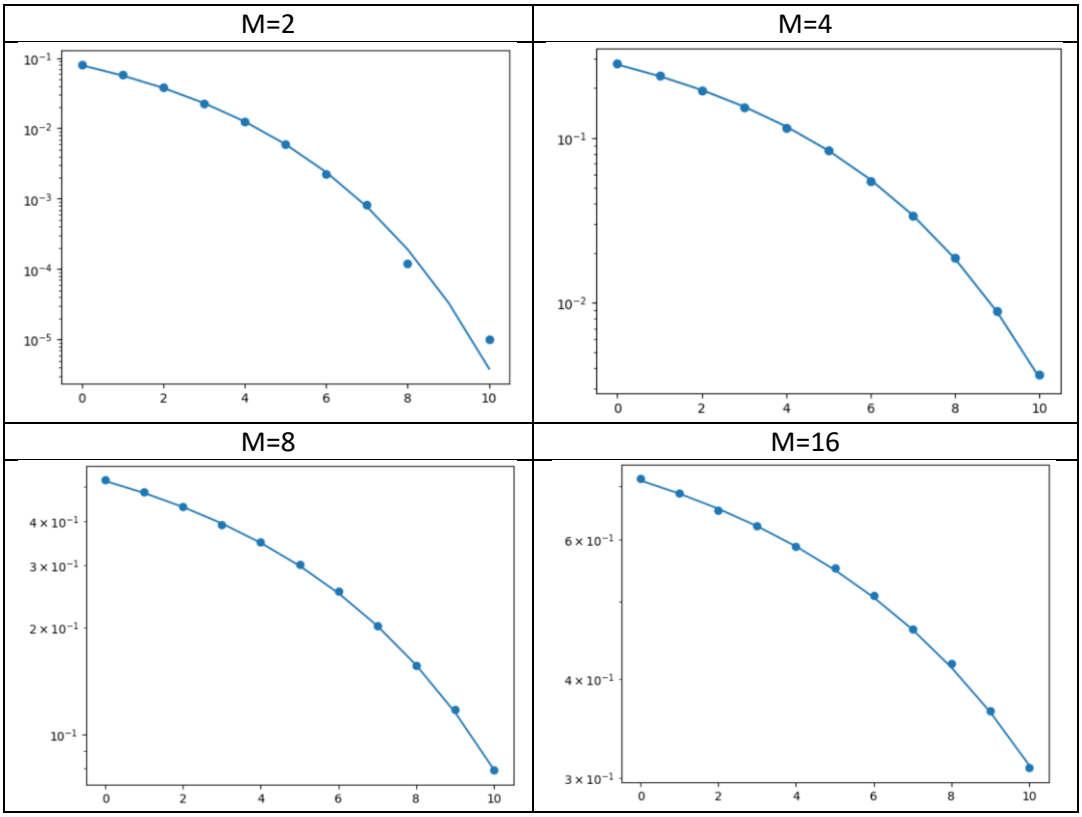
2.b This shows that the decoder is working as intended.

```
decode_seq = MD_symbol_demapper(sym_seq, 4, 1, 'QAM')
print(hamming(bin_seq, decode_seq))
```

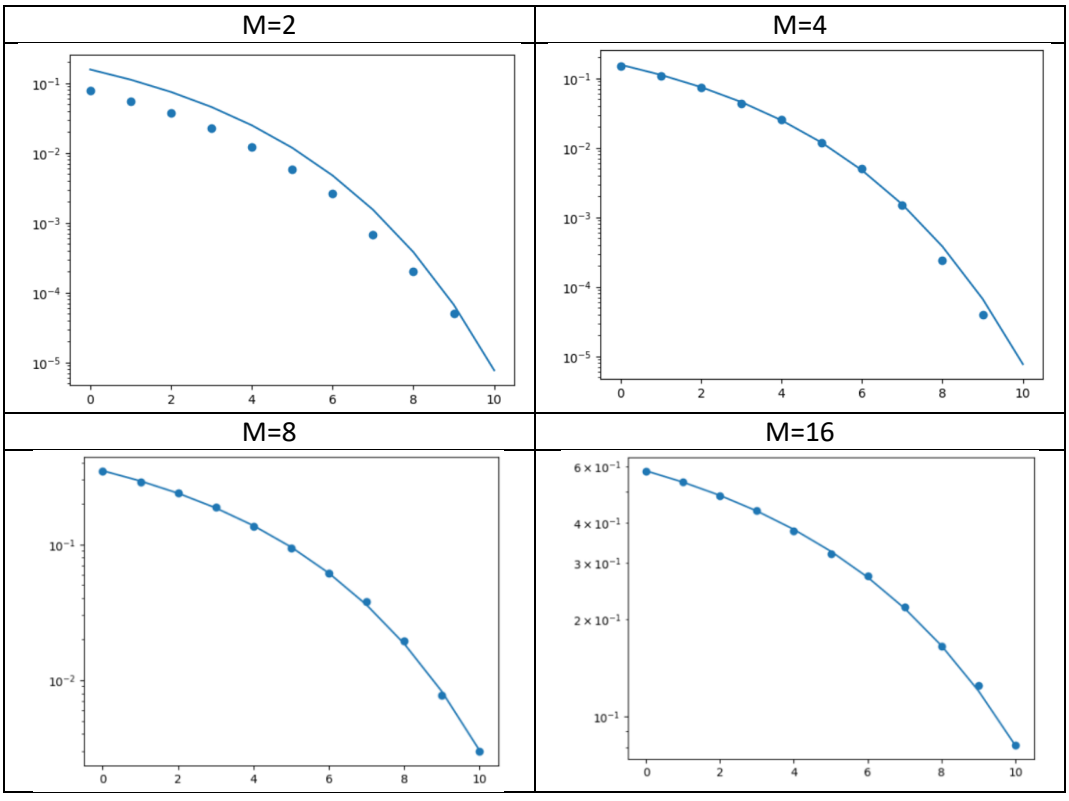
```
0
```

SER for Eb/N_0 = 0, 10, 20 dB are 14.46%, 0.0%, and 0.0% respectively. This can be seen by the graphs above.

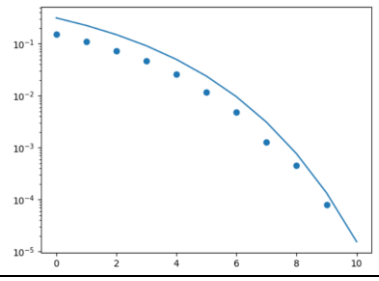
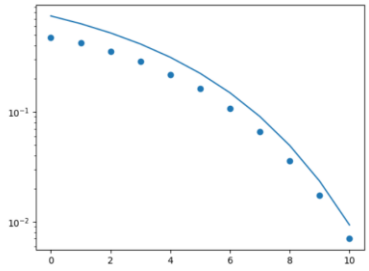
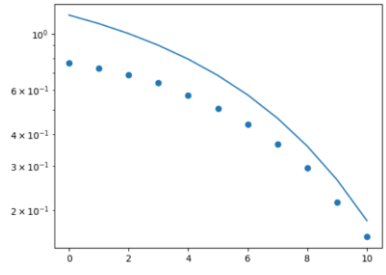
3.a



3.b



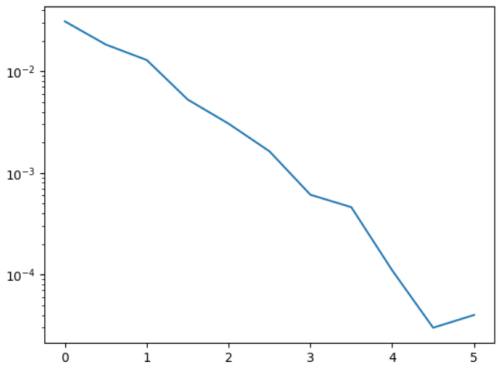
3.c

M=4	M=16	M=64
		

3.d

We can see that the symbol error rate increases as M increases. This is expected because the larger M is, the more data is compressed into a symbol. Hence, the symbol space is compressed and the error probability is increased.

4.a



4.b