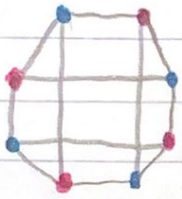
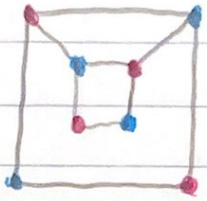
Rodney Fredenchat 10948099

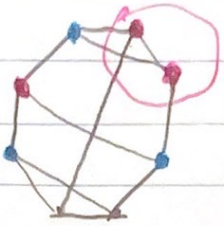
1.



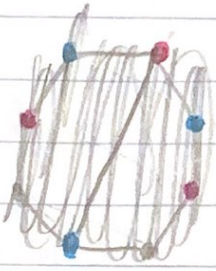
Bipartite

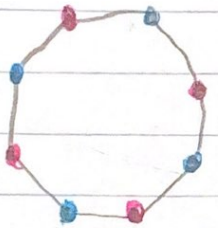


Bipartite



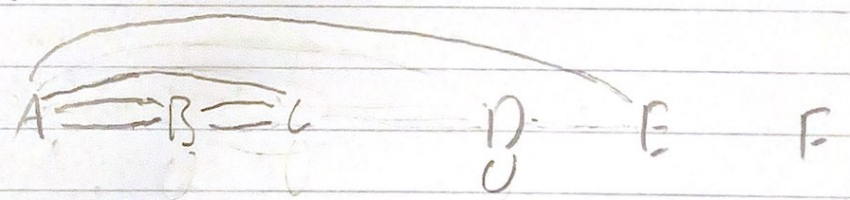
Not bipartite
Two vertices colored pink are next to eachother





You can remove all 4 inside edges to make the graph bipartite

2. A. A B C D E F
5 4 3 2 1 0

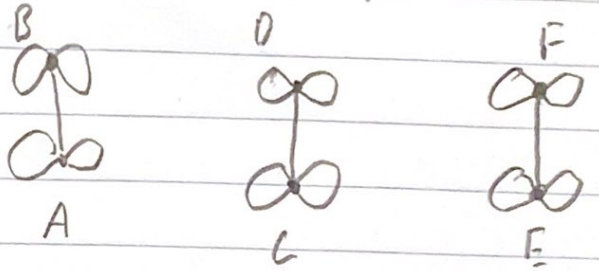


Not Possible

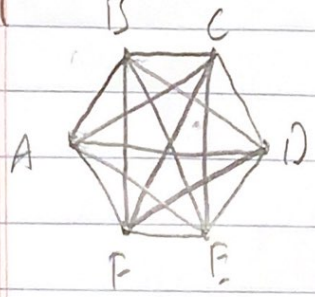
i. No, this degree sequence does not follow the hand shaking theorem. The number of vertices with an odd amount of edges, which is 3, is not Even.

2.A.II. No, because Vertice A has 5 edges, but vertice F has 0 edges. This leaves only 4 other vertices that A can have an edge to, therefore making a simple graph impossible

2.A.III. No, because the degree sequence does not follow the handshake Theorm, as explained in 2.A.I.

2.B.i 

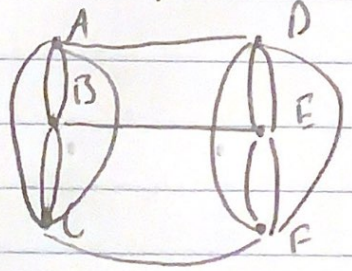
Ex. 2

Ex. 1 


I. Yes, it is possible as I have drawn three graphs.

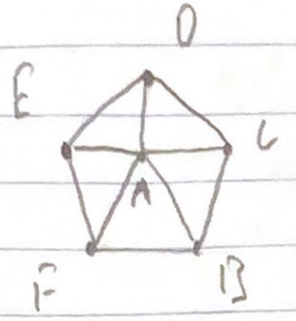
2.B.II. Yes, Ex. 1 is a simple graph.

2.B.III. Yes, I have drawn an example below.

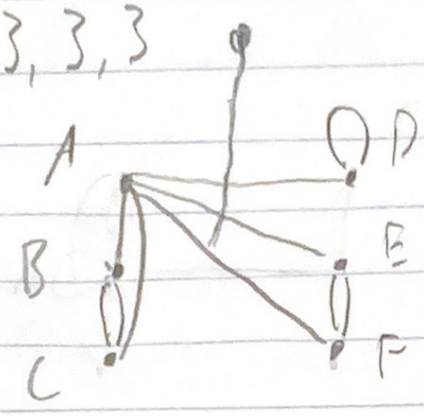


2.C. 5, 3, 3, 3, 3, 3

Ex. 1




Ex. 2




simple graph

Pseudo graph

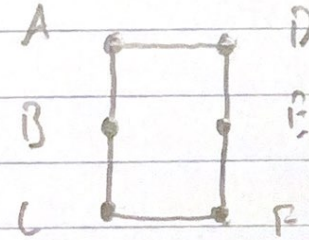
2.C.I. Yes, I have two graphs drawn above.

2.C.II. Yes, Ex. 1 is a simple graph.

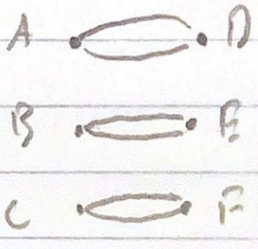
2.C.III. Yes, Ex. 2 has multiple loops.

2.D. 2, 2, 2, 2, 2, 2

Ex. 1




Ex. 2.

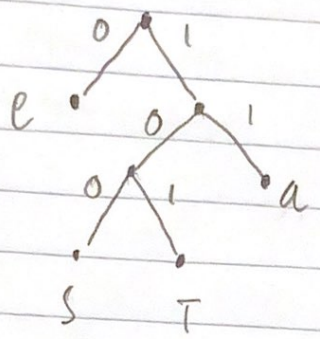



2.D.I. Yes, I have two graphs drawn.

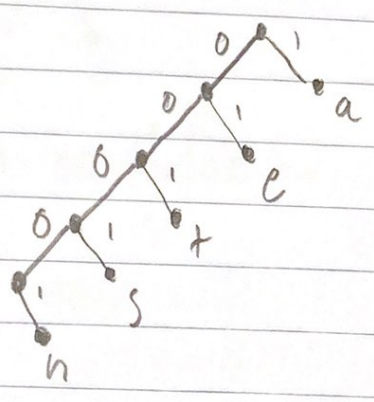
2.D.II. Yes, Ex. 1 is a simple graph.

2.D.III Yes, Ex. 2 is a multigraph.

3. A. a:11 e:0 t:101 s:100

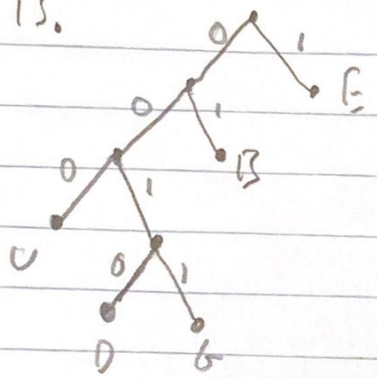



B. a:1 e:01 t:001 s:0001 n:00001



4.a. There are only 4 combinations with bit length of 2, 00, 01, 10, 11. However There are 5 letters, so The minimum bit length is 3.

B.




C. M = 0010|1|01|000|011

0010 = D
1 = E
01 = B
000 = U
0011 = G

M = DEBUG

D. E = 80 B = 55 U = 45 D = 15 G = 5

(80·1) + (55·2) + (45·3) + (15·4) + 5(5)

= 410 Bits