X2: Binary search tree in alphabetical order:

oenology
campanology   phro phronology
alchemy   ichthyology   ornithology
astrology   ~~limnology~~
limnology

Ex.24: Huffman coding:

0.10	0.25	0.05	0.15	0.30	0.07	0.08	
A	B	C	D	E	F	G	

Step 1

0.08 0.08 0.10 0.12 0.15 0.25 0.30
G   G   A   (F,C with 0,1)   D   B   E

Step 2

0.12 (0 F, 1 C)   0.15 D   0.18 (0 A, 1 G)   0.25 B   0.30 E

Step 3

0.18 (A, G)   0.25 B   0.27 (D 0, 1 → F 0, C 1)   0.30 E

Step 4

0.27 (D 0, 1 → F, C)   0.30 E   0.43 (B 0, 1 → A, G)

Step 5

0.5? 0.43 (B, A, G)   0.57 (E, D, F, C)

1.00 (E D F C A G)
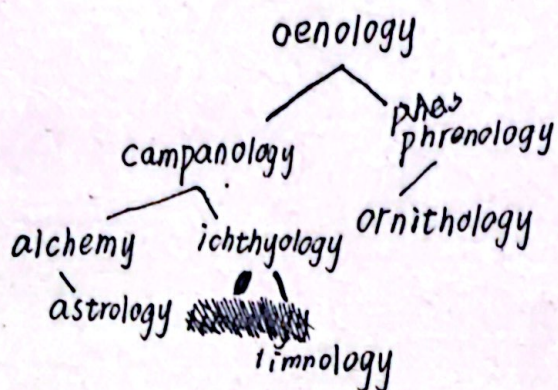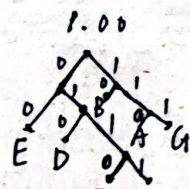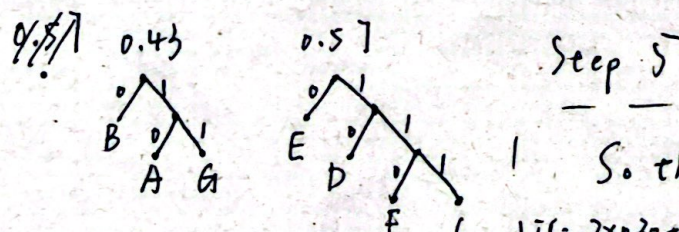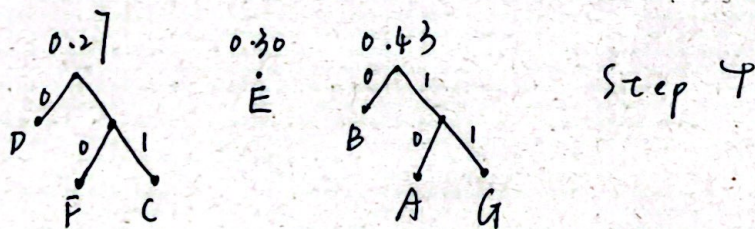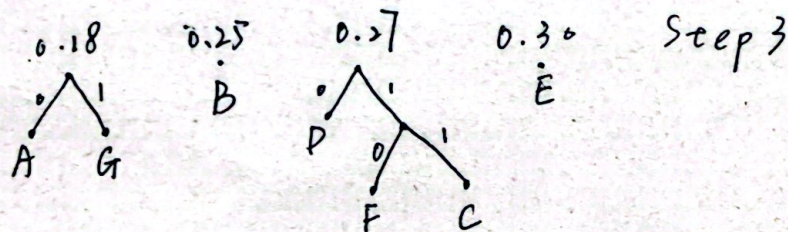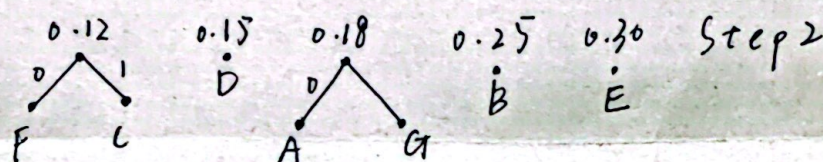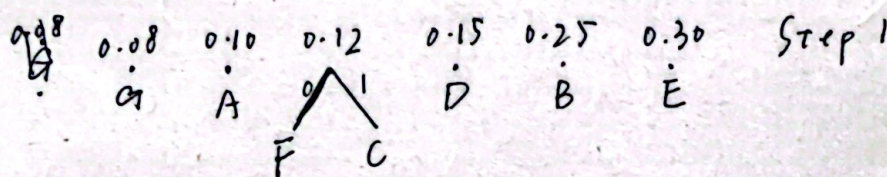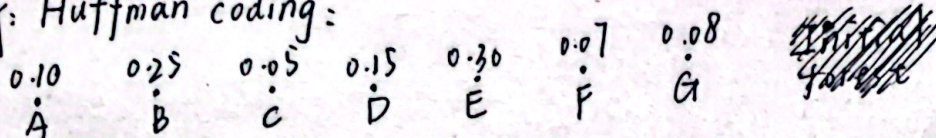
Step 6

So the average number of bits is:

$$2 \times 0.30 + 2 \times 0.25 + 3 \times 0.15 + 3 \times 0.10 + 3 \times 0.08 + 4 \times 0.07 + 4 \times 0.05 = 2.57$$

Section 11.3

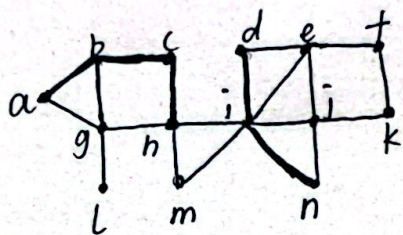Ex.8 Preorder: a b d e i j m n o c f g h k l p

Ex.12. Inorder: ~~k e l m b f g r n s c o d h d i f p j q~~
k e l m b f r n s g a c o h d i p j q

Ex.14. Postorder: d i m n o j e b f g k p l h c a

Section 11.4

Ex.14:

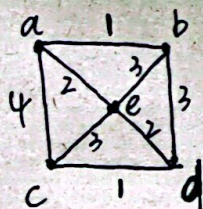$a \to b \to c \to h \to g \to l$

back to h: $h \to i \to d \to e \to f \to k \to j \to n$

back to i: $i \to m$

then all the vertex has been found

Ex.16: $\{a,b\}, \{a,g\}. \to \{g,h\}, \{g,l\} \to \{h,m\}, \{h,i\} \to \{i,d\}, \{i,e\}, \{i,$
$\to \{e,f\}, \{j,k\}$
$\{i$

Section 11.5

Ex.2:

first edge $\{a,b\}$, then $\{b,e\}$, then $\{e,d\}$

finally $\{d,c\}$, total weight is $1+3+2+1=6$

Ex.6: First step: $\{a,b\}$ and $\{c,d\}$ whose weight is 1

then: $\{a,e\}, \{e,d\}$ whose weight is 2

so total weight is $1+1+2+2=6$