INTRO TO CS

Problem 1.1:

In order to find the minimal spanning tree, we must reorder the edges so that their costs are ordered increasingly:

Edge:	(a,f)	(b,c)	(d,e)	(d,f)	(e,f)	(c,f)	(a,e)	(b,f)	(c,d)	(a,b)
cost:	1	2	3	4	5	5	5	6	6	7

now forming the graph from the edge with the lowest cost first and eliminating the edges that form cycles.

E' = {} start, C = 0
A = {{a}, {b}, {c}, {d}, {e}, {f}}

E' = {{a,f}} step 1, C = 1
A = {{a,f}, {b}, {c}, {d}, {e}}

E' = {{a,f}, {b,c}} step 2, C = 3
A = {{a,f}, {b,c}, {d}, {e}}

E' = {{a,f}, {b,c}, {d,e}} step 3, C = 6
A = {{a,f}, {b,c}, {d,e}}

E' = {{a,f}, {b,c}, {d,e}, {d,f}} step 4, C = 10
A = {{a,f,d,e}, {b,c}}

E' = {{a,f}, {b,c}, {d,e}, {d,f}, {c,f}} step 5, C = 15
A = {{a,f,d,e,b,c}}

Problem 1.2:

a)

The naive string search algorithm:

comparing the characters one by one

We are looking for F F L F R in F F L F L F R F R F F L F R F

F	F	L	F	L	F	R	F	R	F	F	L	F	R	F
F	F	L	F	R										
	F	F	l	f	r									
		F	f	l	f	r								
			F	F	l	f	r							
				F	f	l	f	r						
					F	F	l	f	r					
						F	f	l	f	r				
							F	F	l	f	r			
								F	f	l	f	r		
									F	F	L	F	T	

-Alignments used : 10

-comparisons done : 22

b)

We are looking for F F L F R

F	F	L	F	L	F	R	F	R	F	F	L	F	R	F
f	f	l	f	R										
		F	F	L	F	R								
				f	f	L	F	R						
									F	F	L	F	R	

-Alignments used : 4

-comparisons done : 14

c)

The lookup table:

	F	F	L	F	R
	0	1	2	3	4
L	0	1	-	3	4
R	0	1	2	3	-
F	-	-	2	-	4
P	0	1	2	3	4

Problem 1.3:

a) operations such as + , - or = will return an error because the program won't know from where to start reading it.

b) The dollar operator is right associative and has a level of precedence of 0.

the infix notation:

(^) 2 $ (*) 5 $ (+) 2 3 = (^) 2 $ (*) 5 $ 5 = (^) 2 $ 25 =2^(25)