Chapter 1-2 Notes

Deterministic diagraphs require arrows from the accept state, whereas non-deterministic diagraphs stop at the accept state

Deterministic Graphs cannot have a two letters that lead to the same state (e.g. 0 and 1 go from q4 to q5 is not allowed).

Question 0: 010 would not be accepted

It would accept anything has 101 or 11 though

Question 2:

Q = {q1, q2, q3, q4}

Sigma = {0, 1}

delta =

	0	1	ε
q_1	$\{q_1\}$	$\{q_1, q_2\}$	$\emptyset$
q_2	$\{q_3\}$	$\emptyset$	$\{q_3\}$
q_3	$\emptyset$	$\{q_4\}$	$\emptyset$
q_4	$\{q_4\}$	$\{q_4\}$	$\emptyset$,

q0 = q1

F = {q4}

NFAs are equivalent to DFAs in terms of power, as they understand the same language. It's just more compact in NFA form I believe.

Question 3:

Q = {1, 2, 3}

Sigma = {a, b}

Delta =

δ	a	b	ϵ
1	$\emptyset$	$\{2\}$	$\{3\}$
2	$\{2,3\}$	$\{3\}$	$\emptyset$
3	$\{1\}$	$\emptyset$	$\emptyset$

Q_0 = 1

F = {1}

Question 4:

Q′ ={∅,{1},{2},{3},{1,2},{1,3},{2,3},{1,2,3}}

Question 5:

Sigma' = {{a}, {b}, {a,b}, {a,c}, {b,c}, {a,b,c}

Question 6:

q'_0 = {1,3}

Question 7:

F' = { {1}, {1,2}, {1,3}, {1,2,3} }

Question 8:

δ'	a	b
∅	∅	∅
{1}	∅	{2}
{2}	{2,3}	{3}
{3}	{1,3}	∅
{1,2}	{2,3}	{2,3}
{1,3}	{1,3}	{2}
{2,3}	{1,2,3}	{3}
{1,2,3}	{1,2,3}	{2,3}

Now that we know about NFA's, we can get back to unions, concatenations, and intersections.

Question 9:

Q={q_0} ∪ Q1 ∪ Q2