Solutions for Assignment #4

Assignment Information

Maximum grade 20

Due date September 15, 2004

Instructions Textbook
Page 66-67; problems: 2.3.2, 2.3.4
Page 72; problem: 2.4.1 (b) and (c)

2.3.2

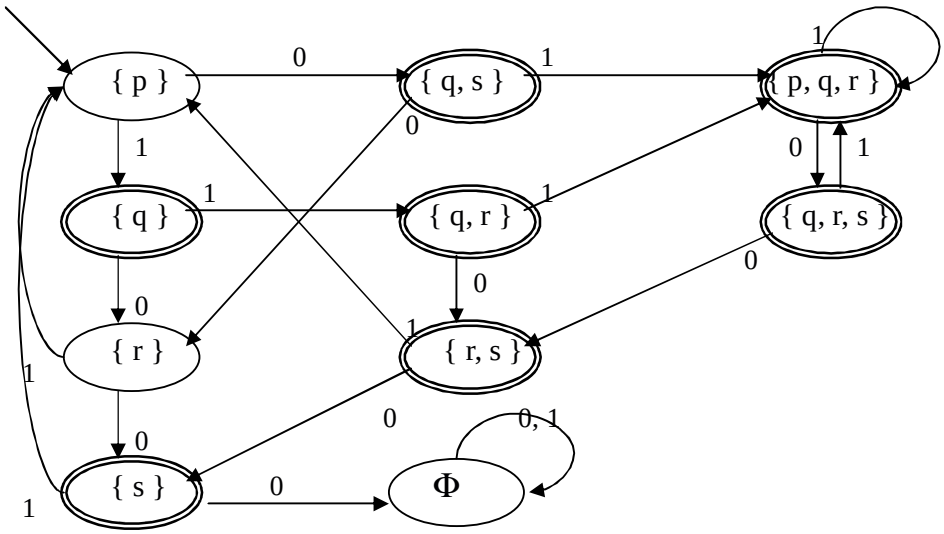
Since given NFA has four states, DFA can have 2^n states. The following is the complete subset construction.

state	0	1
Φ	Φ	Φ
→{p}	{q,s}	{q}
*{q}	{r}	{q,r}
{r}	{s}	{p}
*{s}	Φ	{p}
*{p,q}	{q,r,s}	{q,r}
{p,r}	{q,s}	{p,q}
*{p,s}	{q,s}	{p,q}
*{q,r}	{r,s}	{p,q,r}
*{q,s}	{r}	{p,q,r}
*{r,s}	{s}	{p}
*{p,q,r}	{q,r,s}	{p,q,r}
*{p,q,s}	{q,r,s}	{p,q,r}
*{p,r,s}	{q,s}	{p,q}
*{q,r,s}	{r,s}	{p,q,r}
*{p,q,r,s}	{q,r,s}	{p,q,r}

We will get the following transition table and diagram after removing the unnecessary states.

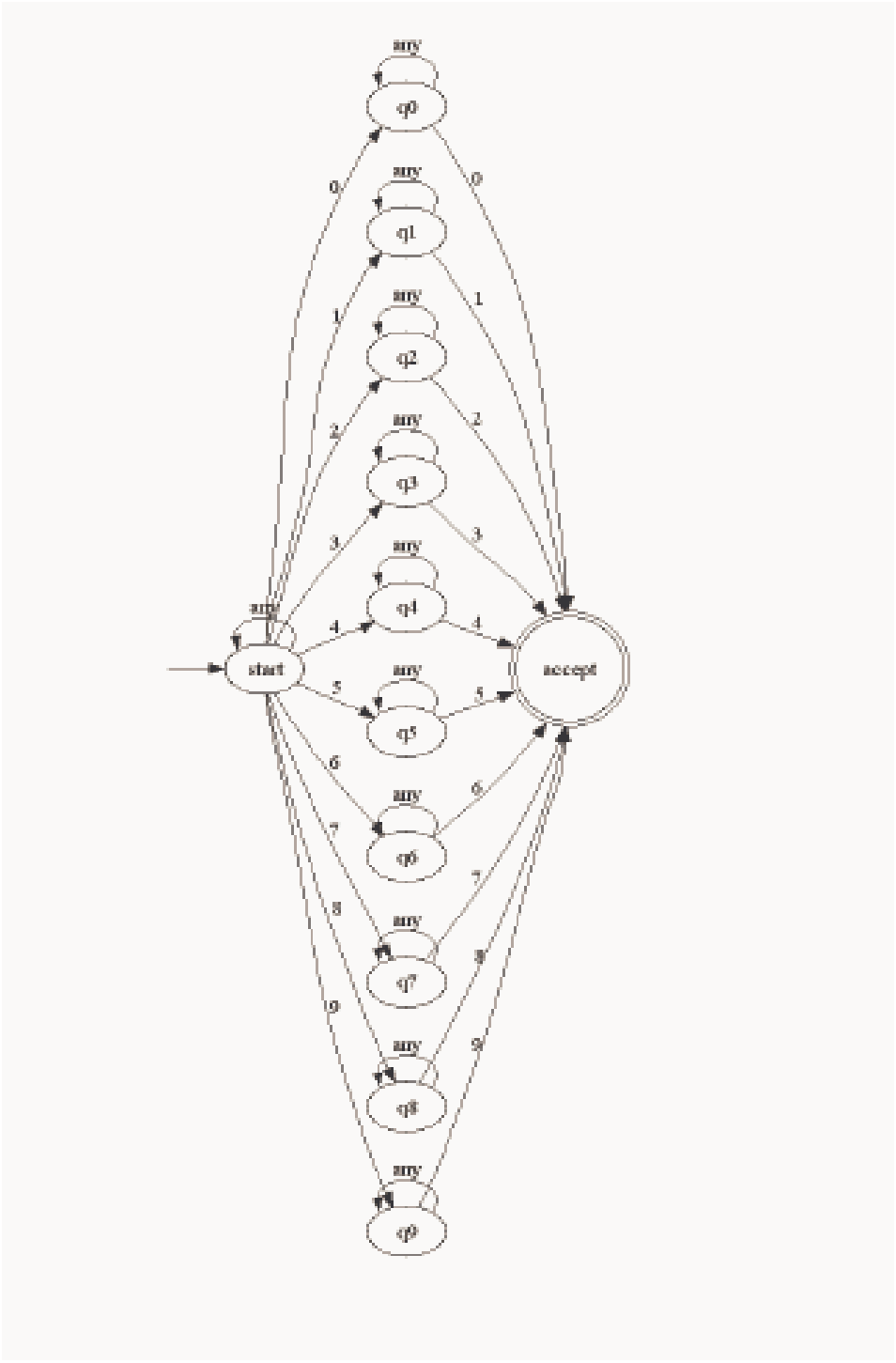
State	0	1
Φ	Φ	Φ
→{p}	{q,s}	{q}
*{q}	{r}	{q,r}
{r}	{s}	{p}
*{s}	Φ	{p}
*{q,s}	{r}	{p,q,r}
*{q,r}	{r,s}	{p,q,r}
*{r,s}	{s}	{p}
*{p,q,r}	{q,r,s}	{p,q,r}
*{q,r,s}	{r,s}	{p,q,r}

Transition Table



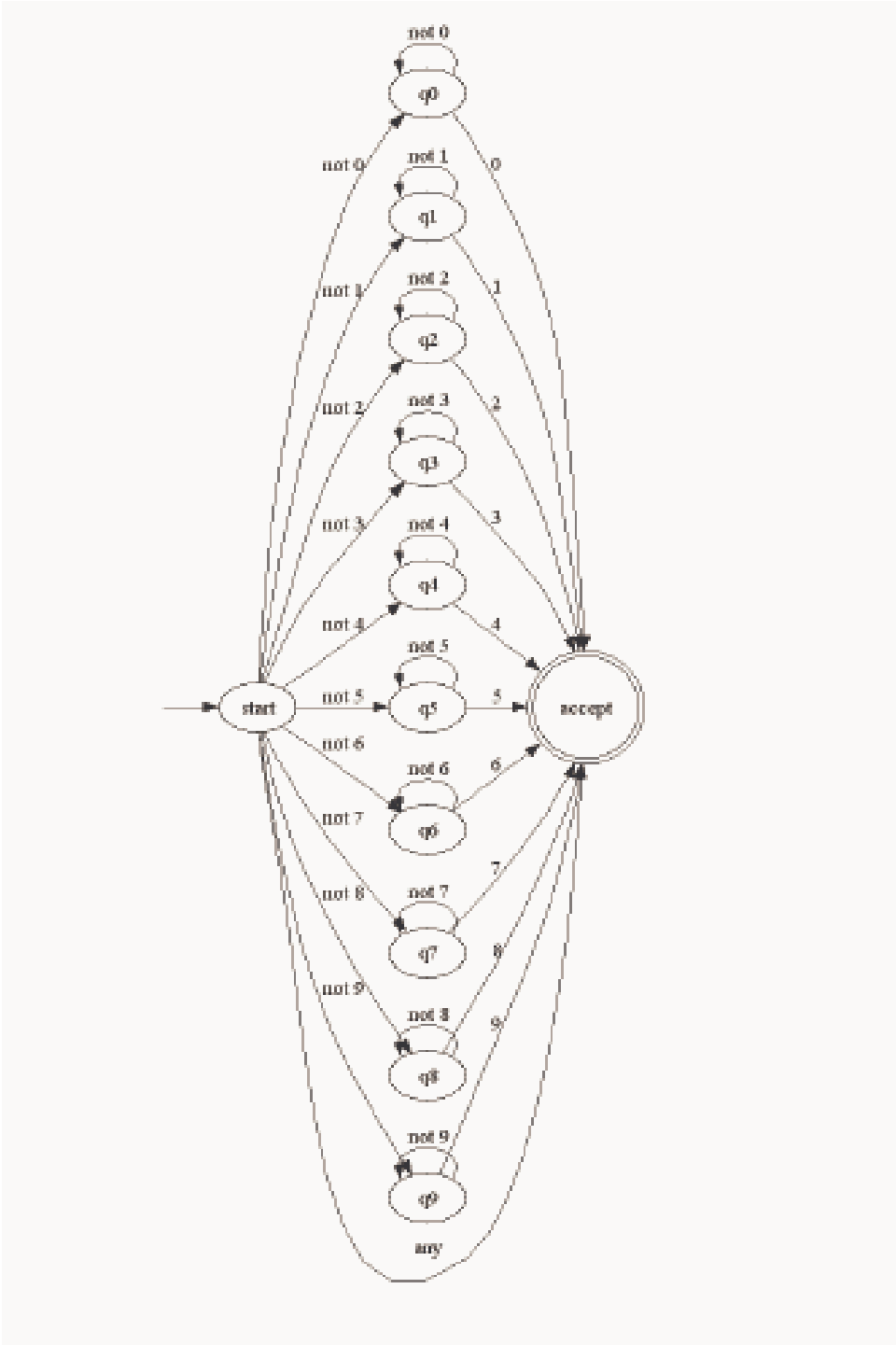
2.3.4

a)



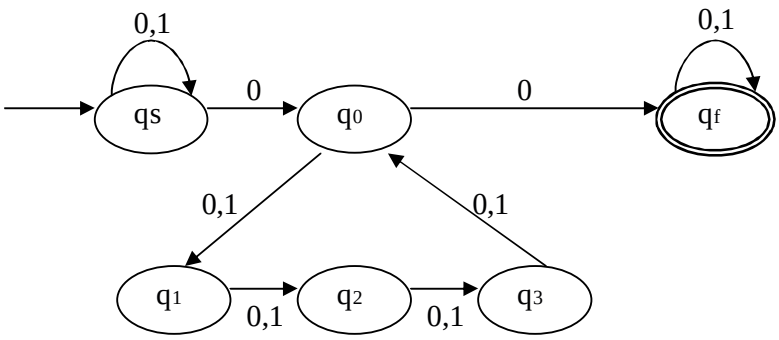
where “any” denotes{0, 1, 2, 3, 4, 5, 6, 7, 8, 9}

b)



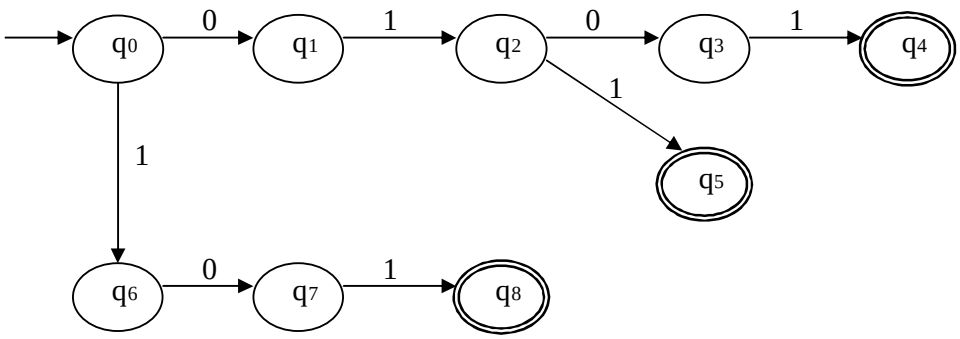
where ‘not #’ denotes {0, 1, 2, 3, 4, 5, 6, 7, 8, 9} – {#}

c)

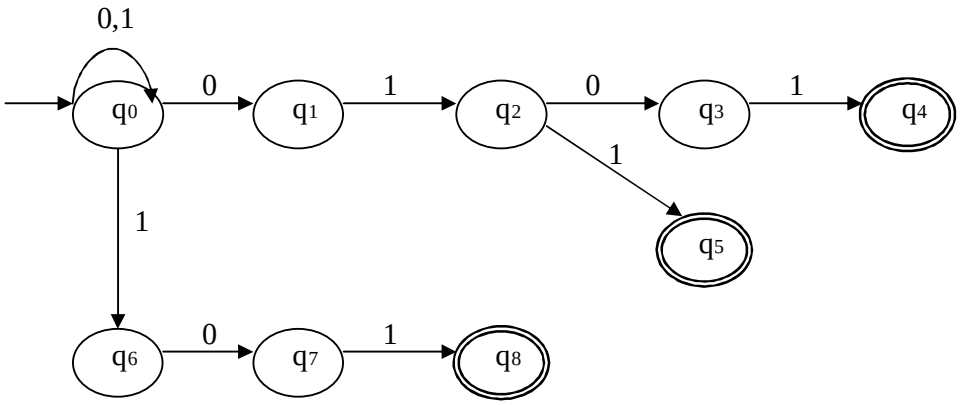


2.4.1

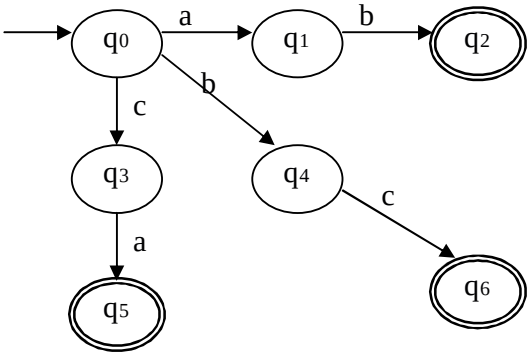
b)


q0
q1
q2
q3
q4
q5
q6
q7
q8
0
1
0
1
1
1
0
1

or


0,1
q0
q1
q2
q3
q4
q5
q6
q7
q8
0
1
0
1
1
1
0
1

c)



or