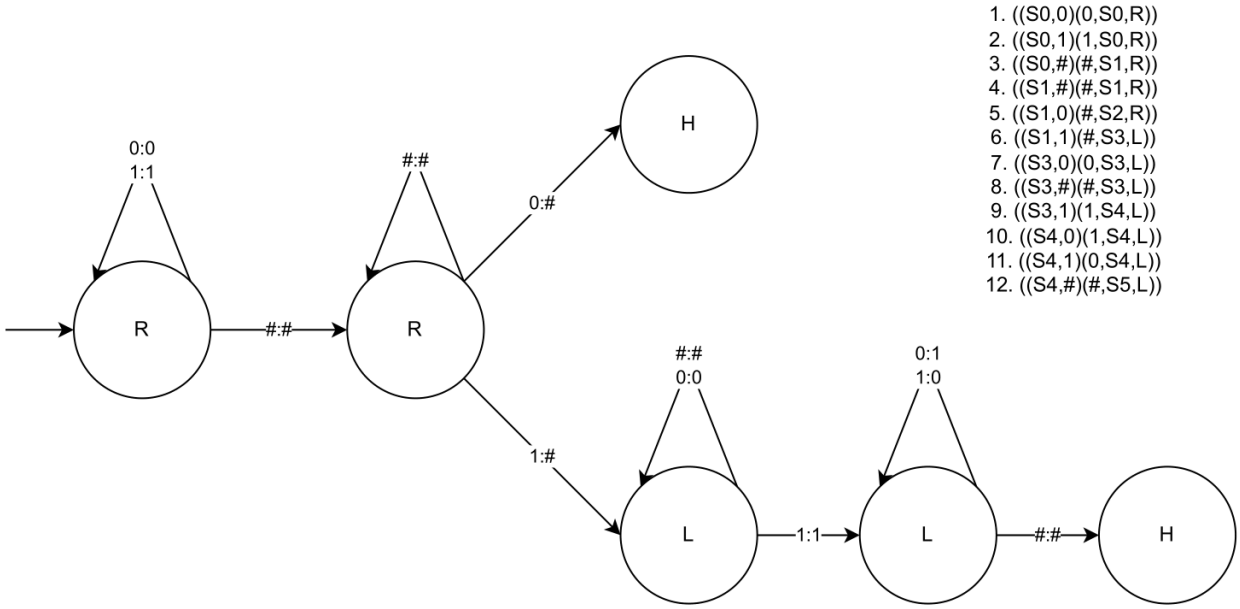
1.



1. ((S0,0)(0,S0,R))
2. ((S0,1)(1,S0,R))
3. ((S0,#)(#,S1,R))
4. ((S1,#)(#,S1,R))
5. ((S1,0)(#,S2,R))
6. ((S1,1)(#,S3,L))
7. ((S3,0)(0,S3,L))
8. ((S3,#)(#,S3,L))
9. ((S3,1)(1,S4,L))
10. ((S4,0)(1,S4,L))
11. ((S4,1)(0,S4,L))
12. ((S4,#)(#,S5,L))

2.
229	101	37	5	5	5	1	1
− 128	− 64	− 32	− 16	− 8	− 4	− 2	− 1
101	37	5	Skip	Skip	1	Skip	0

1 1 1 0 0 1 0 1

3. a.
8+4=C 4+2+1=7 8+2+1=B 8+2=A
1100 0111 1011 1010
C 7 B A

b. ~~110 001 111 011~~
1=1 4=4 2+1=3 4+2=6 4+2+1=7 2=2
001 100 011 110 111 010
1 4 3 6 7 2

4. a. 1 0 0 1 1 0 1 0
128 + 16+8 + 2 = 154

b. 1 0 0 1 1 0 1 0
−128 + 16+8 + 2 = −102

5. a. 2147483647 = $(2^{32}/2)-1$

b: 0 1111111111111111111111111111111
31 one's

c. −2147483648 = $(2^{32}/2)$

d. 10000000000000000000000000000000
31 zero's

6. A.
765 = 001011111101
1027 = 010000000011
-1027 = 101111111101

```
  11111111 1
 001011111101
+101111111101
-------------
 111011111010 = -262
```

B. We can’t calculate 1023 + 1025 because the highest a 12 bit integer in two's complement can be is (2^11)-1 = 2047 while the result of 1023 + 1025 is 2048 meaning the value will overflow to -2048.