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HUMN-2007-001

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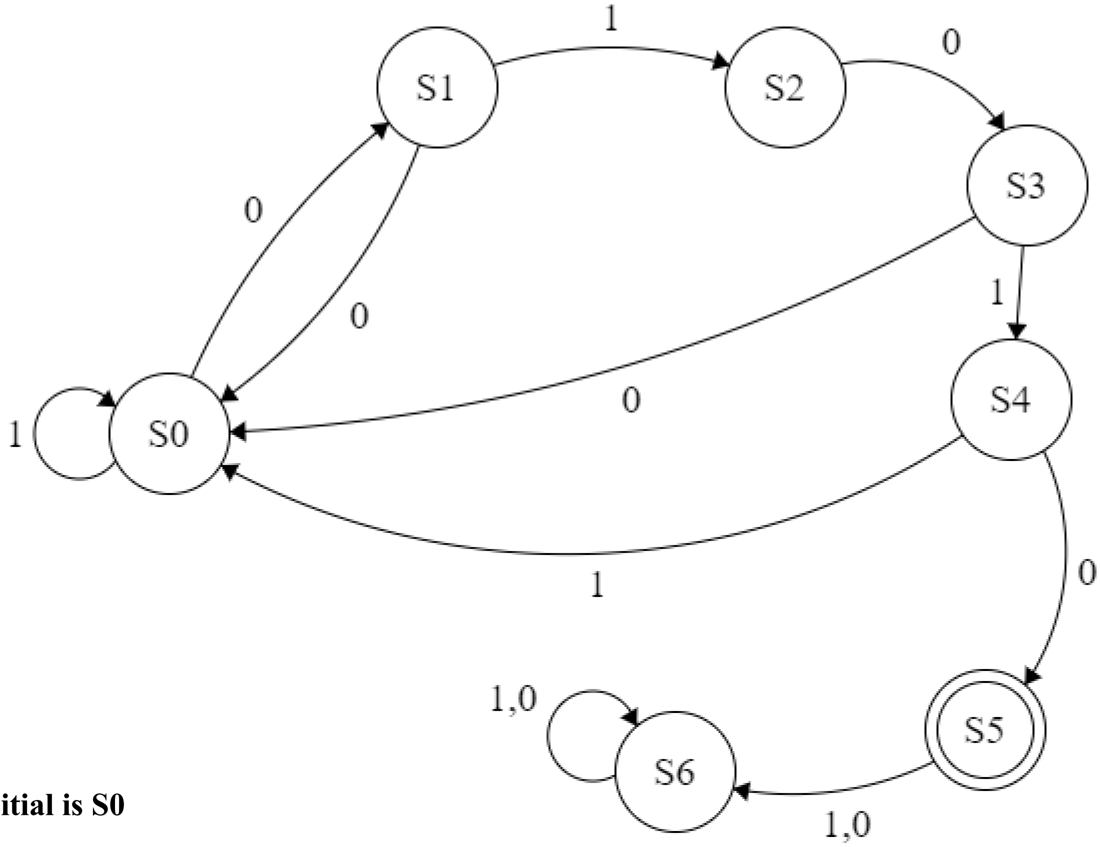
States and Sequences

Q1. Any occurrence (01010)

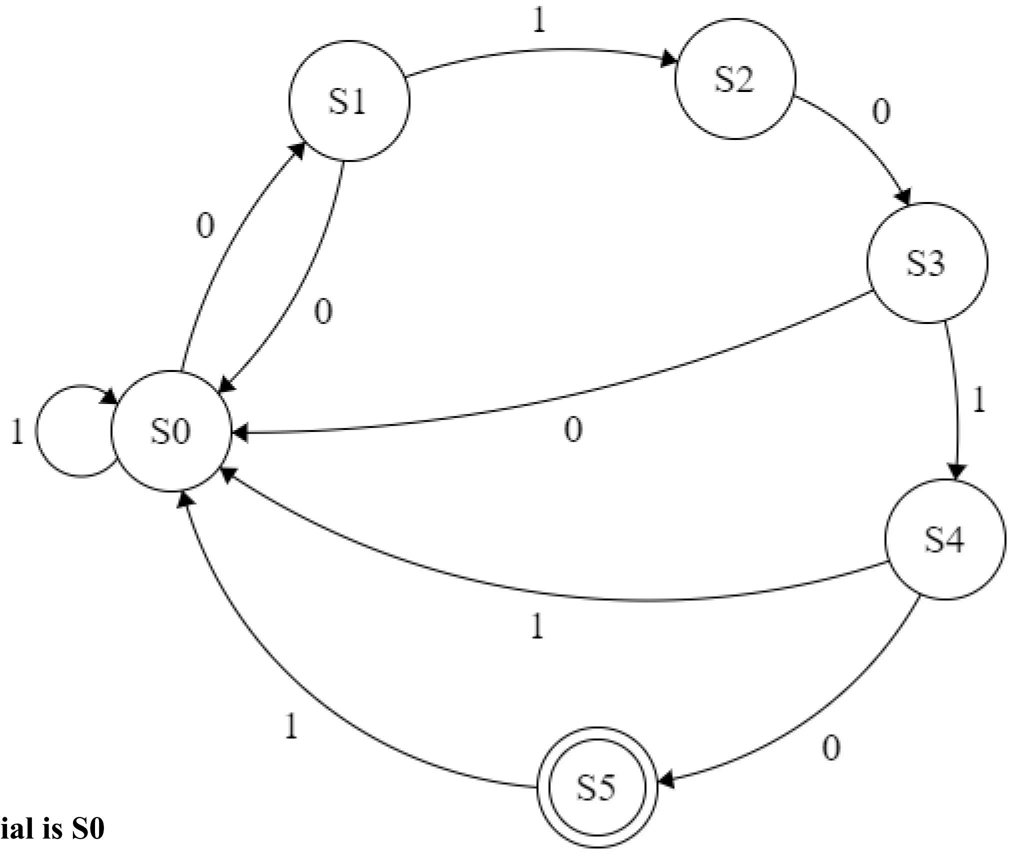
I made the machine with the use of one extra state so the rest of the statement can stay there once the machine has picked up the pattern. I don't think you can make a pattern with fewer states than I have already used.



***Initial is S0**

Q2. Every occurrence (01010)

I didn't add any extra holding states. I have tried making machines with fewer states but there was always some sort of flaw

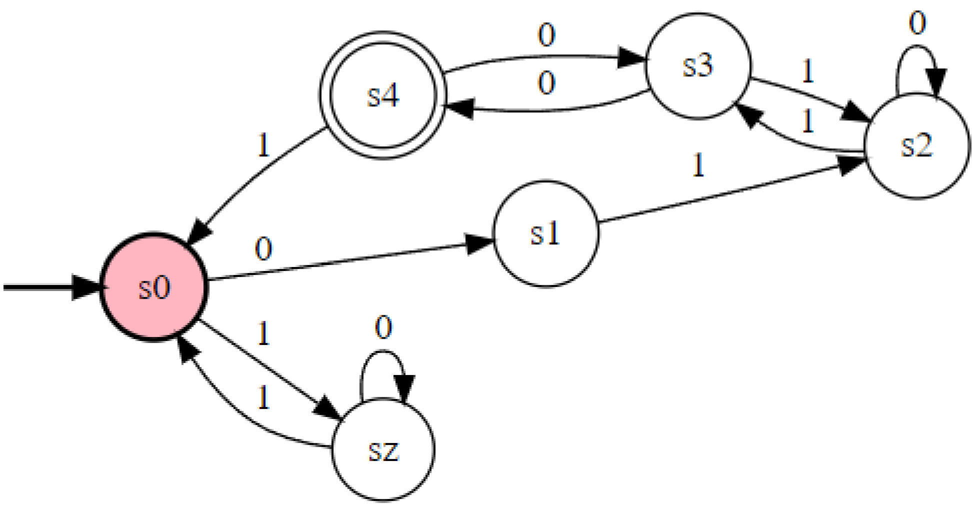


***Initial is S0**

Q3. FSM simulator (starts with 01 and end in 10)

Test #1 (FAIL)

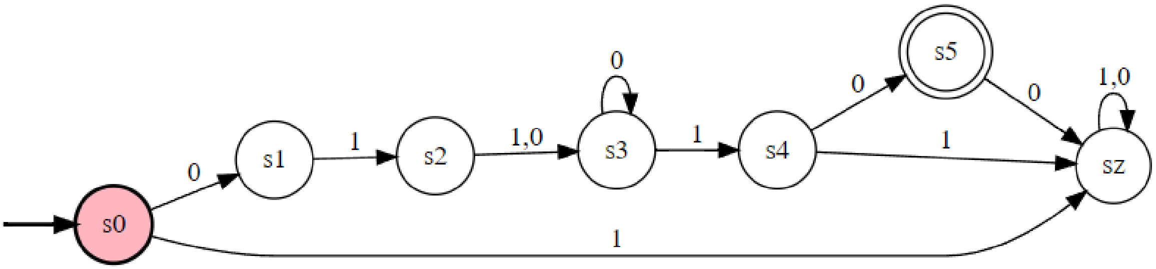
```
#states
s0
s1
s2
s3
s4
sz
#initial
s0
#accepting
s4
#alphabet
1
0
#transitions
s0:0>s1
s1:1>s2
s2:1>s3
s3:0>s4
s4:0>s3
s3:1>s2
s2:0>s2
s4:1>s0
s0:1>sz
sz:1>s0
sz:0>sz
```



- statements like 011000 came out true

Test #2 (FAIL)

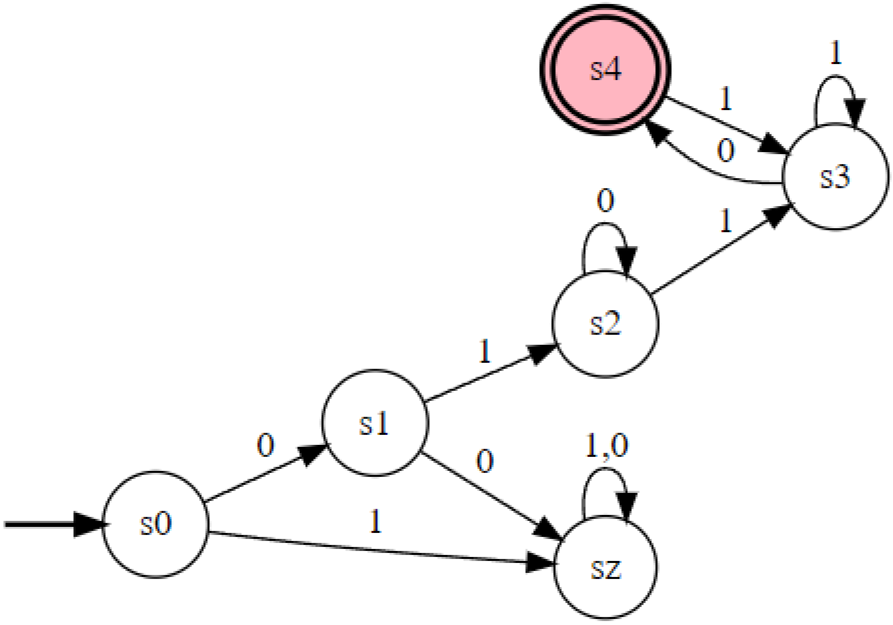
```
#states
s0
s1
s2
s3
s4
s5
sz
#initial
s0
#accepting
s5
#alphabet
1
0
#transitions
s0:0>s1
s1:1>s2
s2:1>s3
s2:0>s3
s3:0>s3
s3:1>s4
s4:0>s5
s4:1>sz
s0:1>sz
sz:1>sz
sz:0>sz
s5:0>sz
```



- I'm not too sure where I was going with this one Many sequences don't work. Mainly I wanted to make a machine that can read 0110 as true and this one can't do that. Later I saw the other flaws in this

Test #3 (WORKS)

```
#states
s0
s1
s2
s3
s4
sz
#initial
s0
#accepting
s4
#alphabet
1
0
#transitions
s0:0>s1
s1:1>s2
s2:1>s3
s2:0>s2
s3:1>s3
s3:0>s4
s0:1>sz
sz:1>sz
sz:0>sz
s1:0>sz
s4:1>s3
```



- Works perfectly. At first, I didn't connect write s4:1>s3 so while I was testing I thought wait what if a statement is 011111010. The s4 doesn't do anything with the 1 and I can't connect it to sz. So then I joined it to s3 and it works well because the s3 keeps the 1to itself.

Q4. Turing Machine

1. Checks if the number on the far left is a 1 or 0

2-6. Goes to far right of the sequence

7. Sees that there is a blank

8. Goes back a space to see if that number matches the first number

9-14. Goes to move back to the far left

15. Reaches far left

16. Reads number

17-19. Goes to far right

20. Sees a blank

21. Goes back a space to see if that number matches the first number

23-25. Goes to far left

26. Reads the far left symbol

27-28. Goes to far right

29. Sees blank

30. Goes back a space to see if that number matches the first number

31-32. Goes to far left

33. Read the far left symbol

34. Sees blank

35-36. Accepts

37. Prints :

38. Prints)