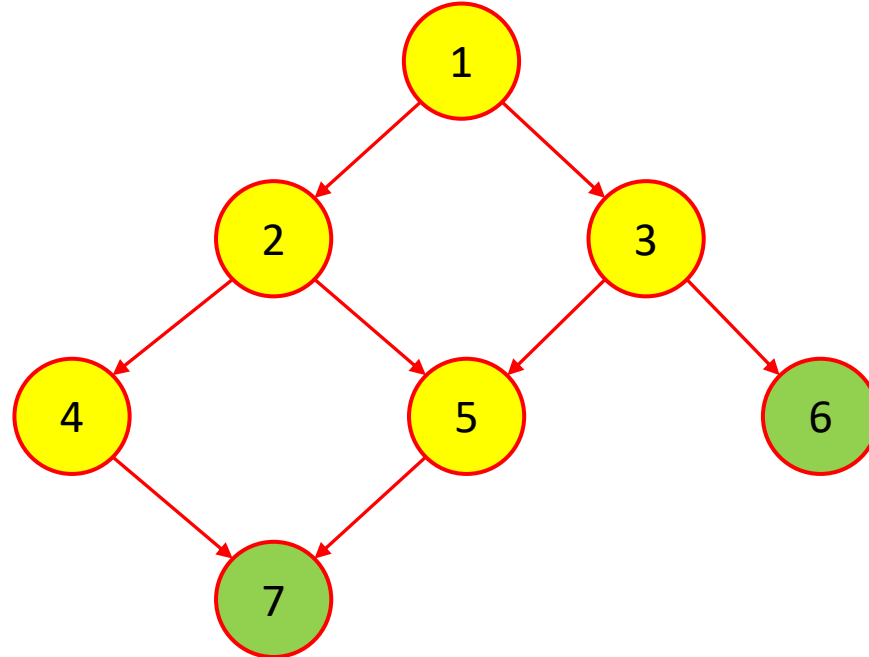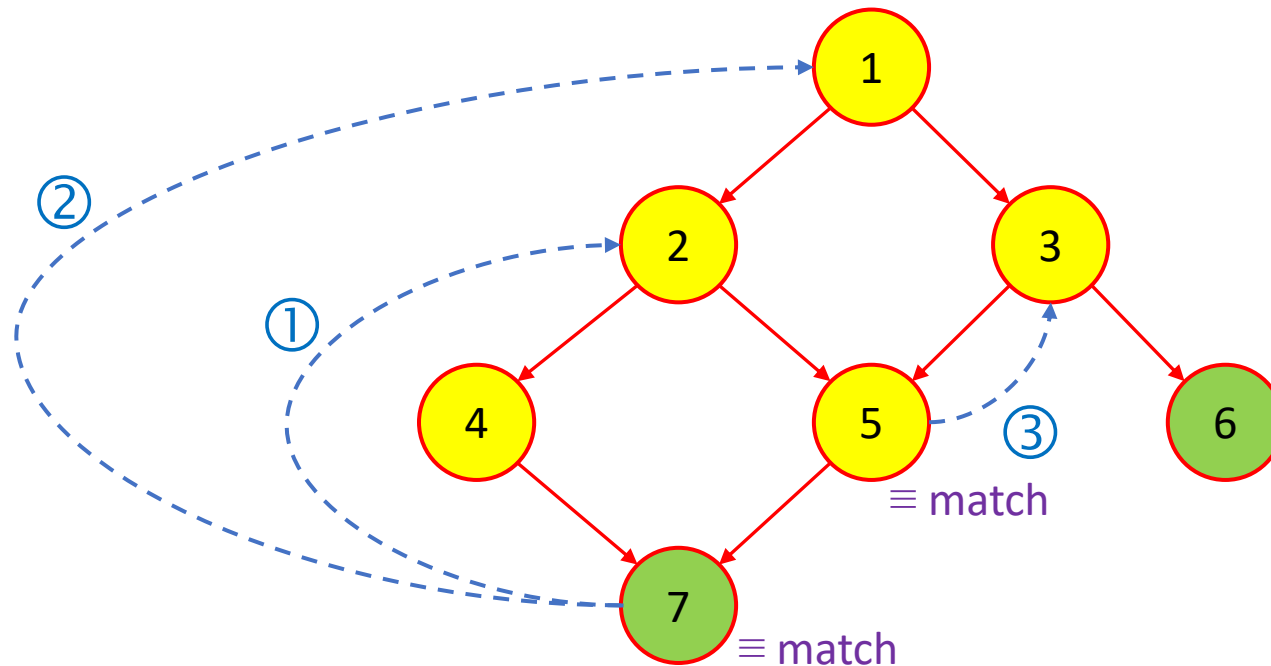# Question

Question> Given the following state transition diagram, there are three backtracking arrows, when doing a depth-first-search (DFS) state space exploration. Fill in the blank start and end states in the table.

Backtracking Arrows	Start State	End State
First arrow		
Second arrow		
Third arrow		

Answer

Answer> States are visited in the order shown. When there is a match or termination, model checker backtracks to nearest state with unexplored transitions.

| Backtracking Arrows	Start State	End State
First arrow	7	2
Second arrow	7	1
Third arrow	5	3

≡ match

≡ match

With backtracking: 1 → 2 → 4 → 7 → 2 → 5 → 7 → 1 → 3 → 5 → 3 → 6

Without backtracking: 1 → 2 → 4 → 7 → 1 → 2 → 5 → 7 → 1 → 3 → 5 → 7 → 1 → 3 → 6

Question

Question> Given the following code, there are four states in the transition diagram: 1, 2, 3, 4. Draw the transition edges yourself (including the backtracking edges) and then list the states in the order of visitation.

```
while(true) {
    x = rand.nextInt(2);
    if(x == 0) break;
}
```

[1]
Start

[2]
x=0

[3]
x=1

[4]
Finish
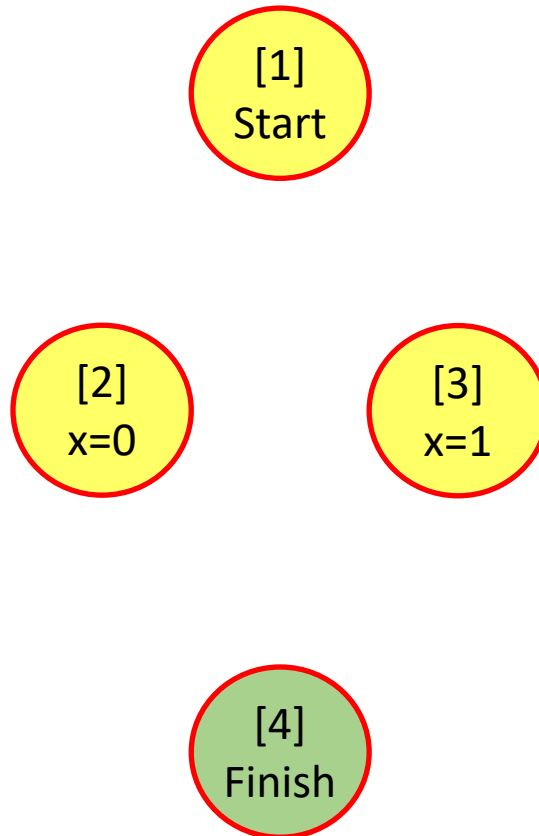
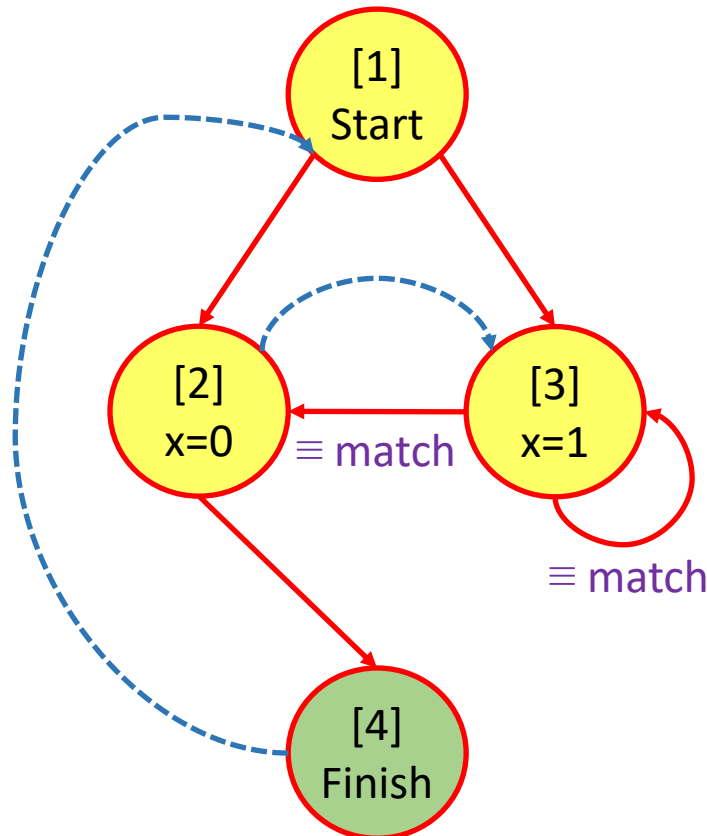| States in the order of visitation |
|---|
| 1 |
| |
| |
| |
| |
| |
| |
| |
| 3 |

Answer

Question> Given the following code, there are four states in the transition diagram: 1, 2, 3, 4. List the states in the order of visitation.

```
while(true) {
  x = rand.nextInt(2);
  if(x == 0) break;
}
```
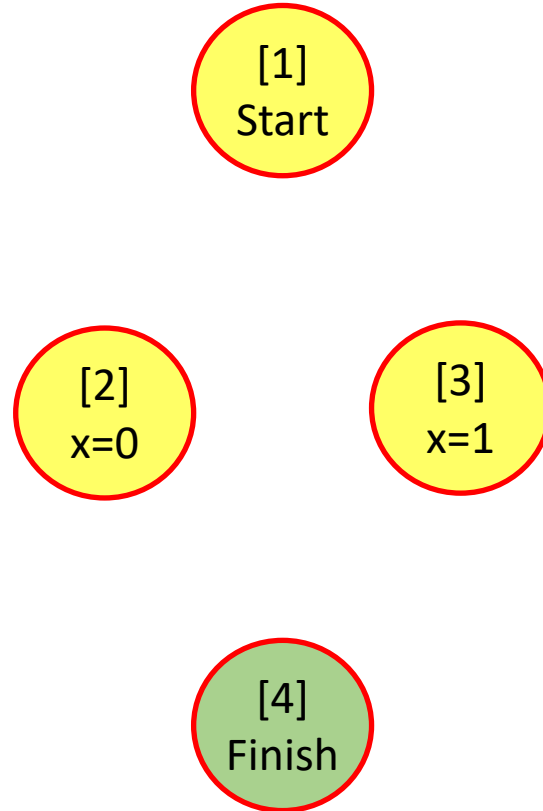

States in the order of visitation
1
2
4
1
3
2
3
3

Question

Question> Given the following code, there are four states in the transition diagram: 1, 2, 3, 4. Draw the transition edges yourself (including the backtracking edges) and then list the states in the order of visitation.

```
while(true) {
  x = rand.nextInt(2);
  if(x == 1) break;
}
```

[1]
Start

[2]
x=0

[3]
x=1

[4]
Finish

States in the order of visitation
1
3

Answer

Question> Given the following code, there are four states in the transition diagram: 1, 2, 3, 4. Draw the transition edges yourself (including the backtracking edges) and then list the states in the order of visitation.
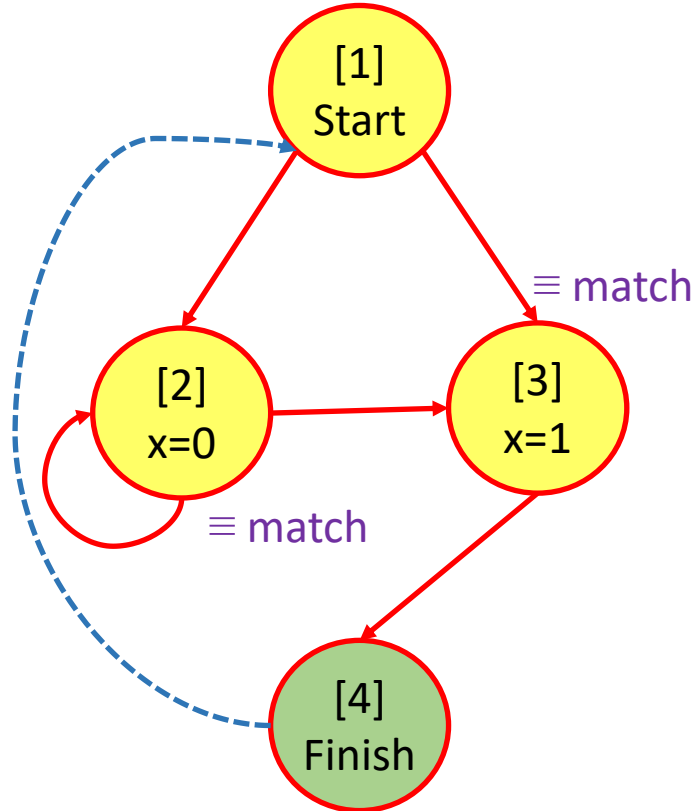
```
while(true) {
  x = rand.nextInt(2);
  if(x == 1) break;
}
```
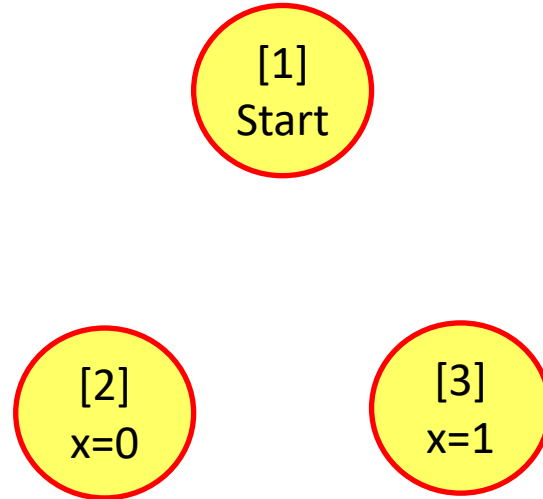

States in the order of visitation
1
2
2
3
4
1
3

Question

Question> Given the following code, there are three states in the transition diagram: 1, 2, 3. Draw the transition edges yourself (including the backtracking edges) and then list the states in the order of visitation.

[1]
Start

```
while(true) {
   x = rand.nextInt(2);
}
```

[2]
x=0

[3]
x=1

States in the order of visitation
1
3

Answer

Question> Given the following code, there are three states in the transition diagram: 1, 2, 3. Draw the transition edges yourself (including the backtracking edges) and then list the states in the order of visitation.
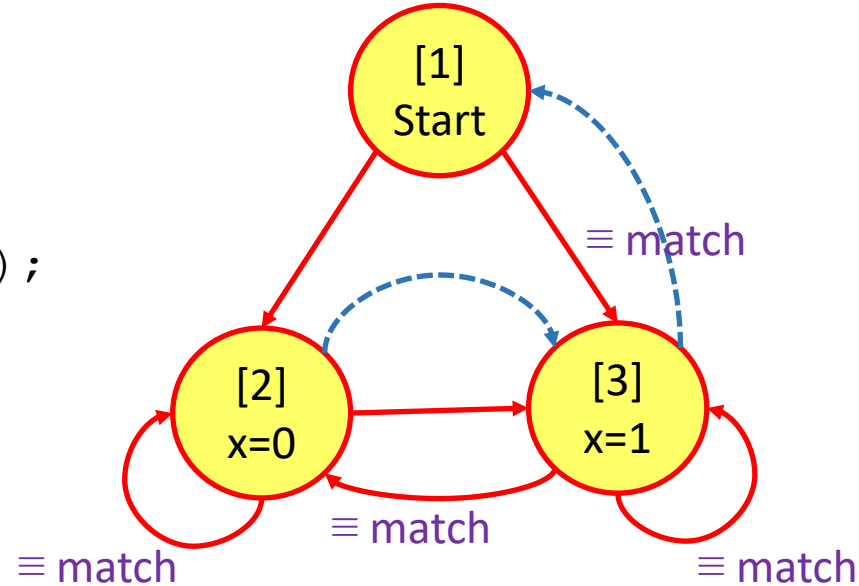
```
while(true) {
  x = rand.nextInt(2);
}
```
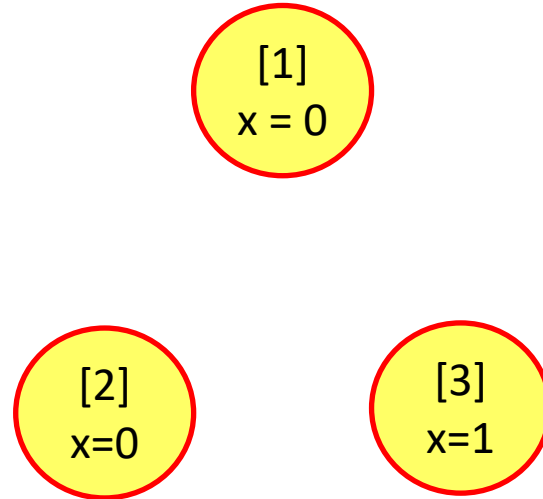

States in the order of visitation
1
2
2
3
2
3
3
1
3

Question

Question> Given the following code, there are three states in the transition diagram: 1, 2, 3. Draw the transition edges yourself (including the backtracking edges) and then list the states in the order of visitation.

```
x = 0;
while(true) {
    x = (x + 1) % 2;
}
```

[1]
x = 0

[2]
x=0

[3]
x=1

States in the order of visitation
1

Answer

Question> Given the following code, there are three states in the transition diagram: 1, 2, 3. Draw the transition edges yourself (including the backtracking edges) and then list the states in the order of visitation.
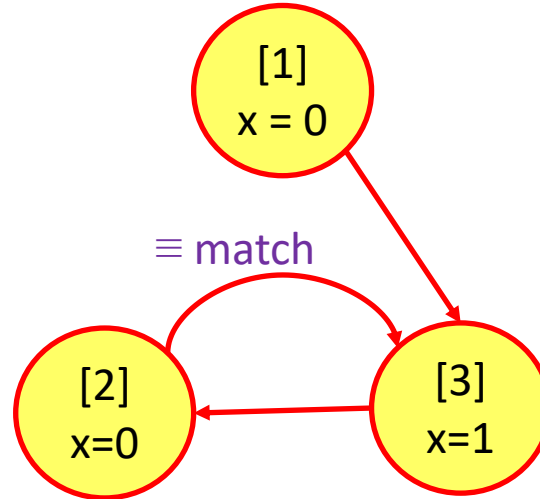
```
x = 0;
while(true) {
    x = (x + 1) % 2;
}
```


States in the order of visitation
1
3
2
3