CS 512, Spring 2018, Handout 01

Motivating Examples

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example: code fragment written in GCL

taken from Example 18 in *Properties of Transition Systems* (click to retrieve):

```
...
test1 := false; test2 := false;
do true → test1 := true;  ··· # process A
| test1 → test2 := true;  ··· # process B
| test2 → test2 := false; ··· # process C
od
...
```

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taken from Example 18 in *Properties of Transition Systems* (click to retrieve):

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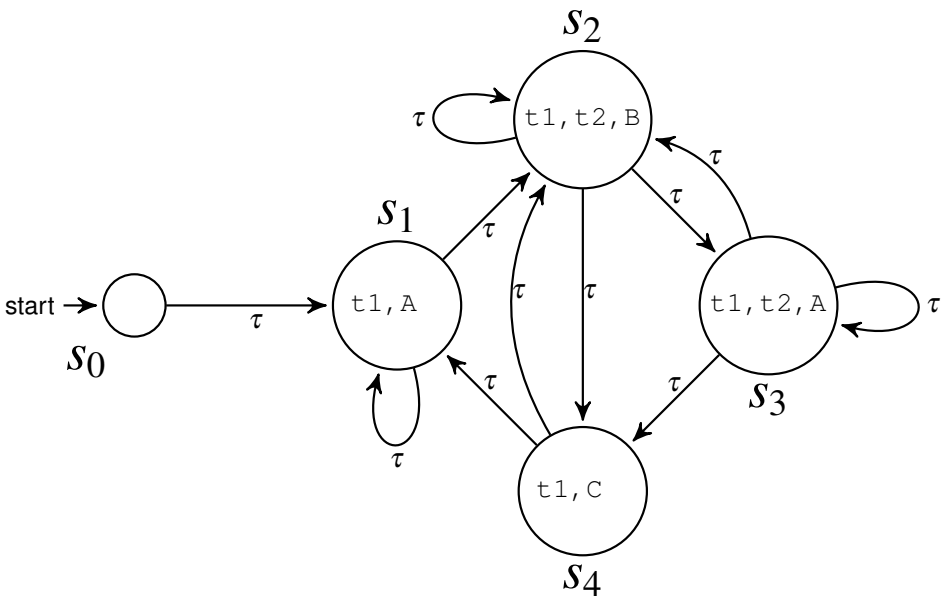
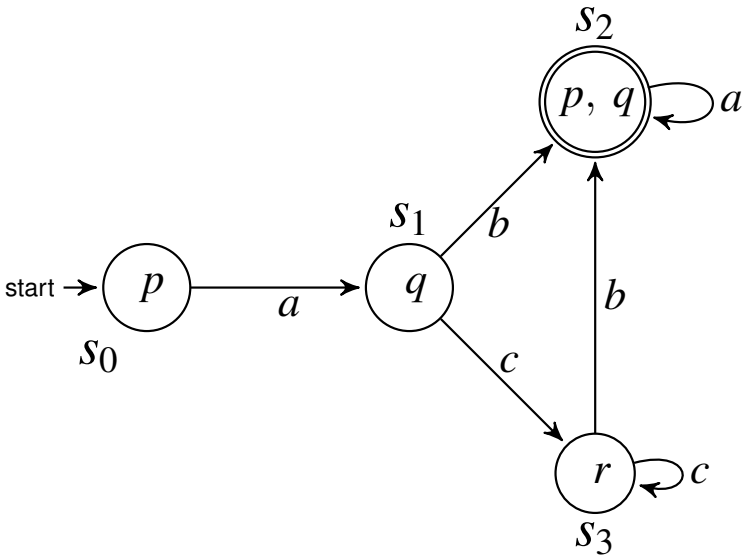
...
test1 := false; test2 := false;
do true → test1 := true;  ··· # process A
| test1 → test2 := true;  ··· # process B
| test2 → test2 := false; ··· # process C
od
...
```

which can be represented by the following **transition system** (actually, its graph):

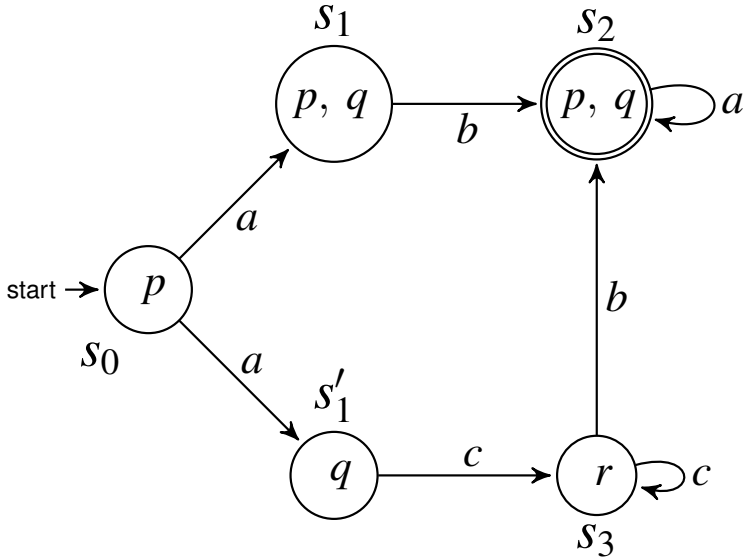


τ = 'silent' step
(invisible to the observer)

example: a *transition system* is more than an *automaton*

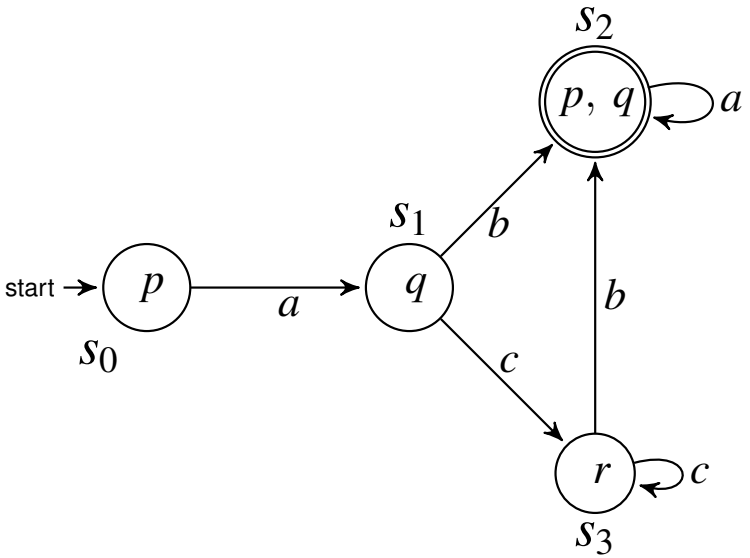


(deterministic?)

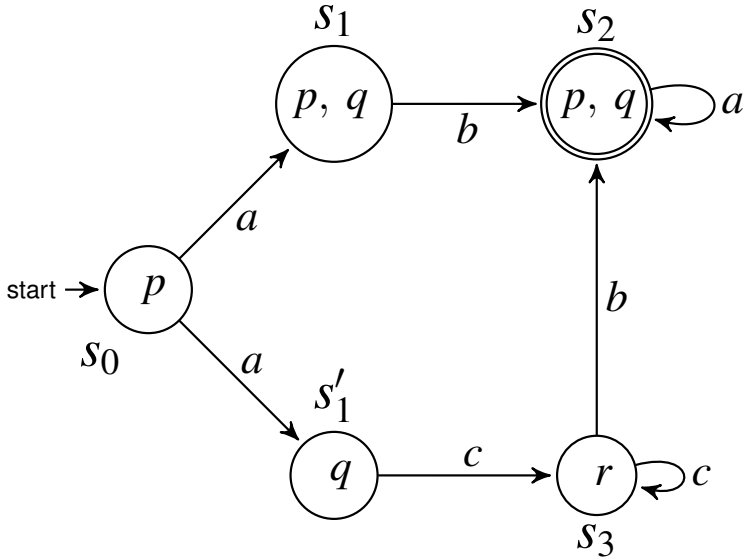


(non-deterministic)

example: a *transition system* is more than an *automaton*



(deterministic?)



(non-deterministic)

- as finite automata, they are equivalent and ***accept/recognize*** the set of ***strings/words*** defined by the regular expression $a\,b\,a^* + a\,c\,c^*\,b\,a^*$.

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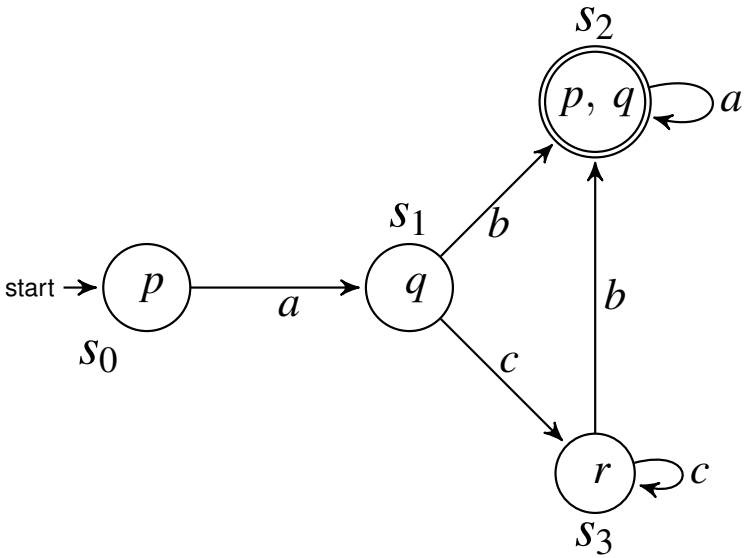
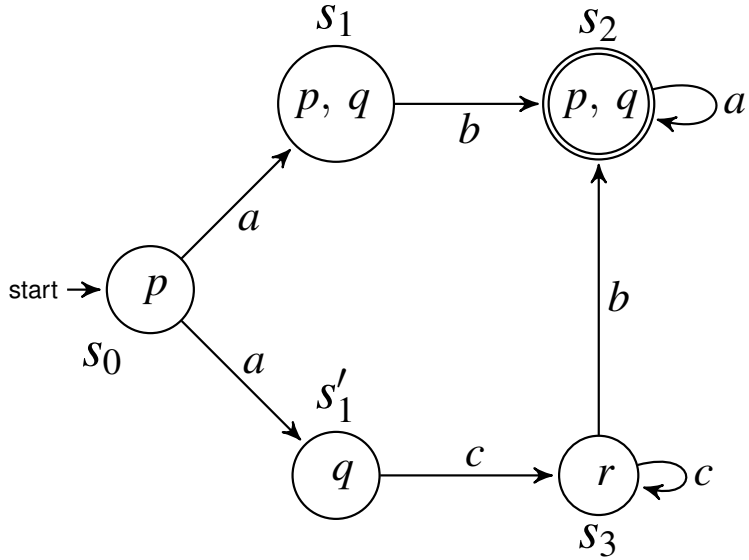


(deterministic?)



(non-deterministic)

- as finite automata , they are equivalent and ***accept/recognize*** the set of ***strings/words*** defined by the regular expression $a\,b\,a^* + a\,c\,c^*\,b\,a^*$.
- as transition systems , they are not equivalent, because the ***observable*** propositional atoms in state s_1 and s'_1 are different .

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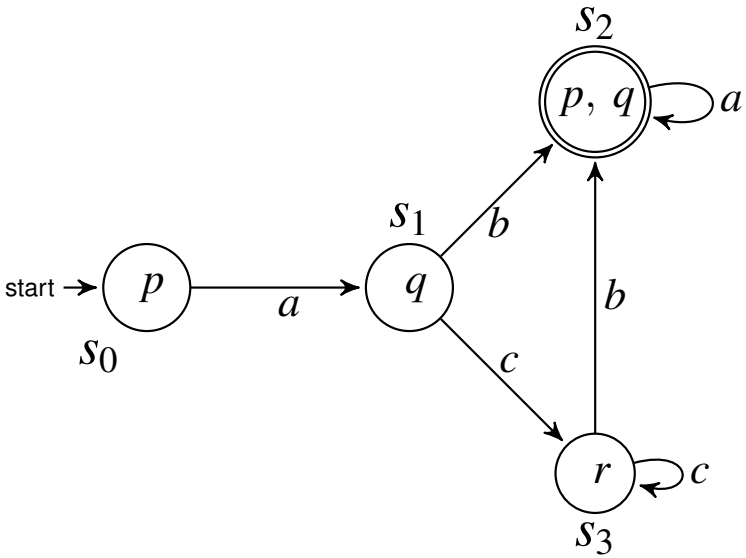
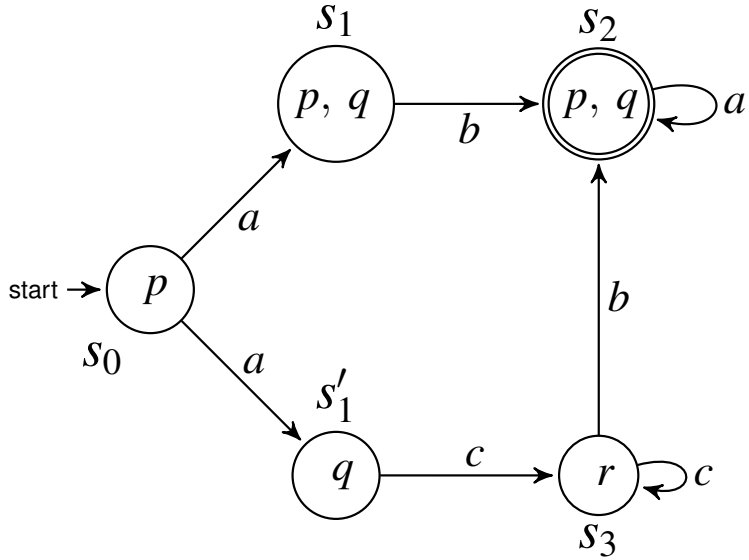


(deterministic?)



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- as transition systems, they are not equivalent, because the ***observable*** propositional atoms in state s_1 and s'_1 are different .
- as ω-automata, they are . . . .
  (stick around, if you want to hear the story later in the semester)

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