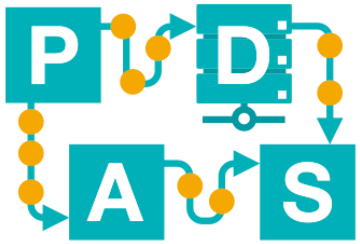
Process Mining - Instruction

Lecture 14

IDS-L14-I



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Process Discovery

Process Discovery

In the lecture you have seen the key concepts of Process Discovery:

- **Process data often comes in form of events (event logs), recorded with a timestamp, case ID, and activity of the event**
- **Doing Process Discovery means creating a model representing the behavior in the event data**
- **Many formalisms for models (Petri nets, process trees, others)**

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Process Discovery

How do people create process models without Process Mining?

By hand!

Process models are often designed by hand. Usually, these models are drawn by experts of a certain process and reflect how thing *should* go in reality (normative process model).

Process Discovery

Process Discovery is hard even when a human and a computer work together. Two (of many) reasons:

- **As it is also the case in Machine Learning, you only get to observe a part of reality. Your model has to balance between fitting both the data you have and also unseen process instances.**

Process Discovery

Process Discovery is hard even when a human and a computer work together. Two (of many) reasons:

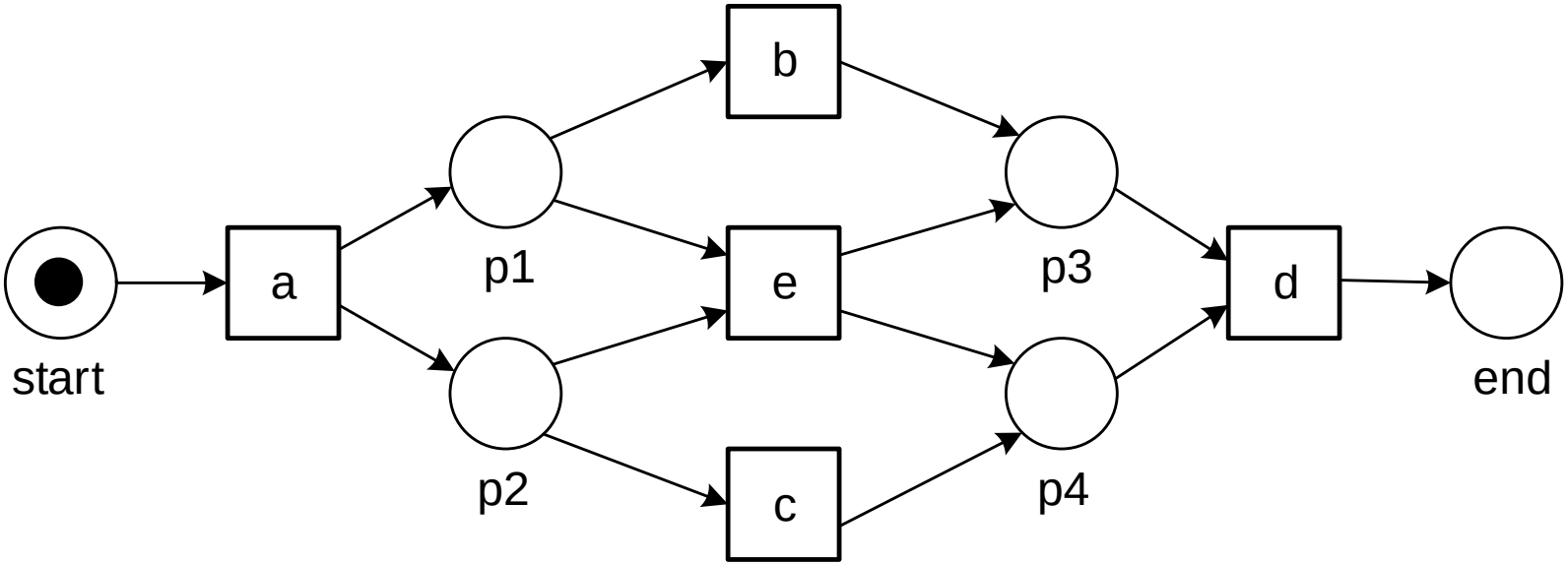
- **A problem more specific to Process Mining: you only get to observe positive behavior. Event logs cannot contain negative examples, and you do not have examples of what *cannot happen*.**

Process Models: Petri Nets

Recall from the lecture:

- **Petri nets are composed by directed arcs, places, and transitions.**
- **Places contain tokens. A specific configuration of tokens in a net is called a marking.**
- **Transition can fire, consuming a token from the input places, putting a token in the output places, and "producing" and event.**
- **Initial and final markings define the start and end of a trace.**

“Playing out”



Initial marking

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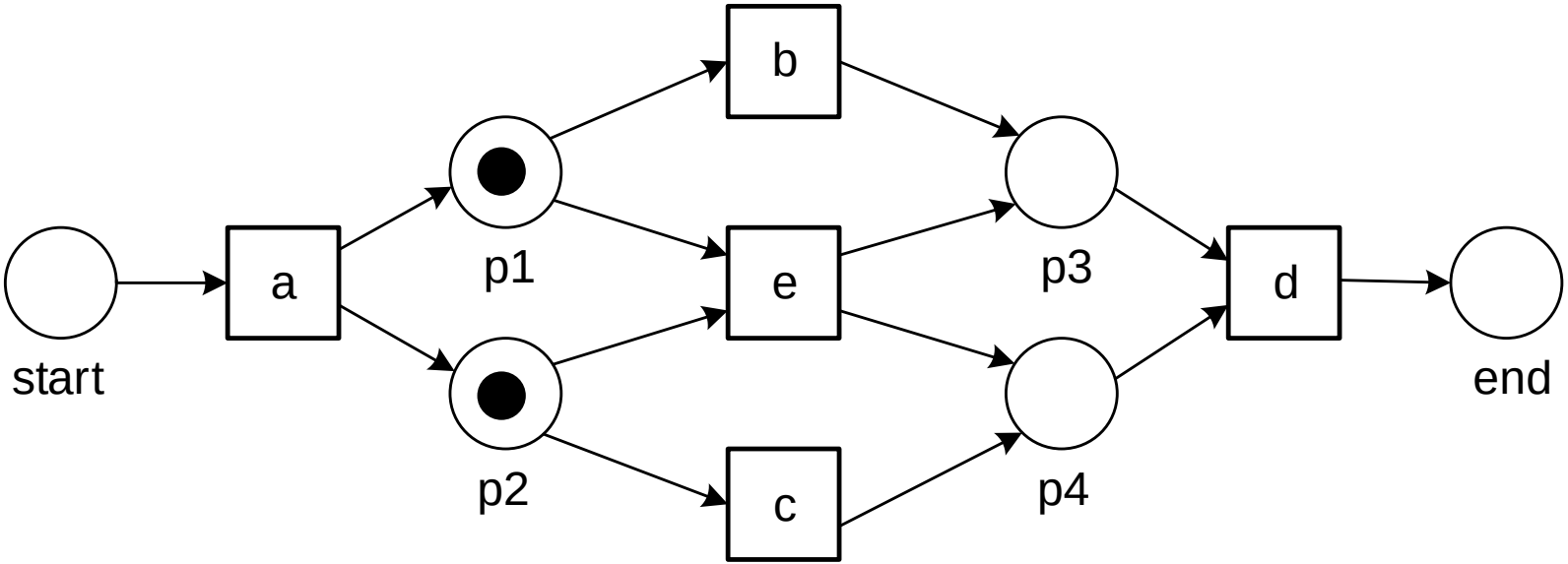
“Playing out”



<a>

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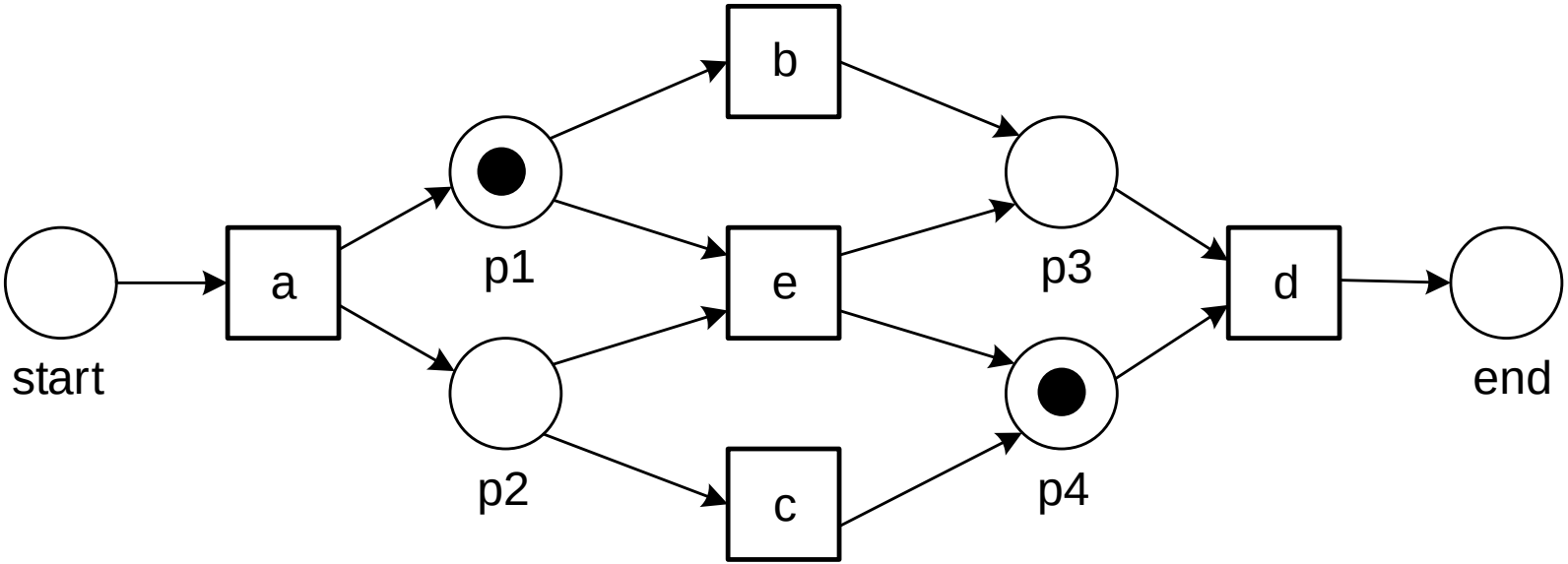
“Playing out”



<a,c>

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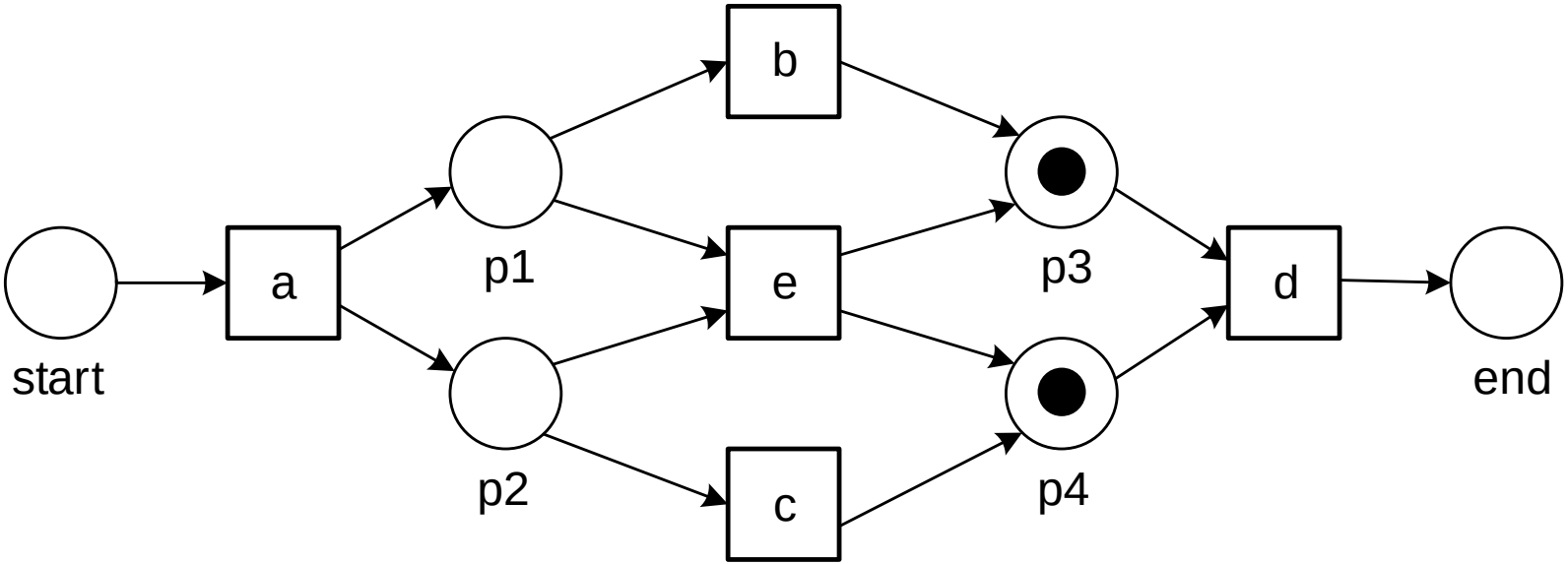
“Playing out”



<a,c,b>

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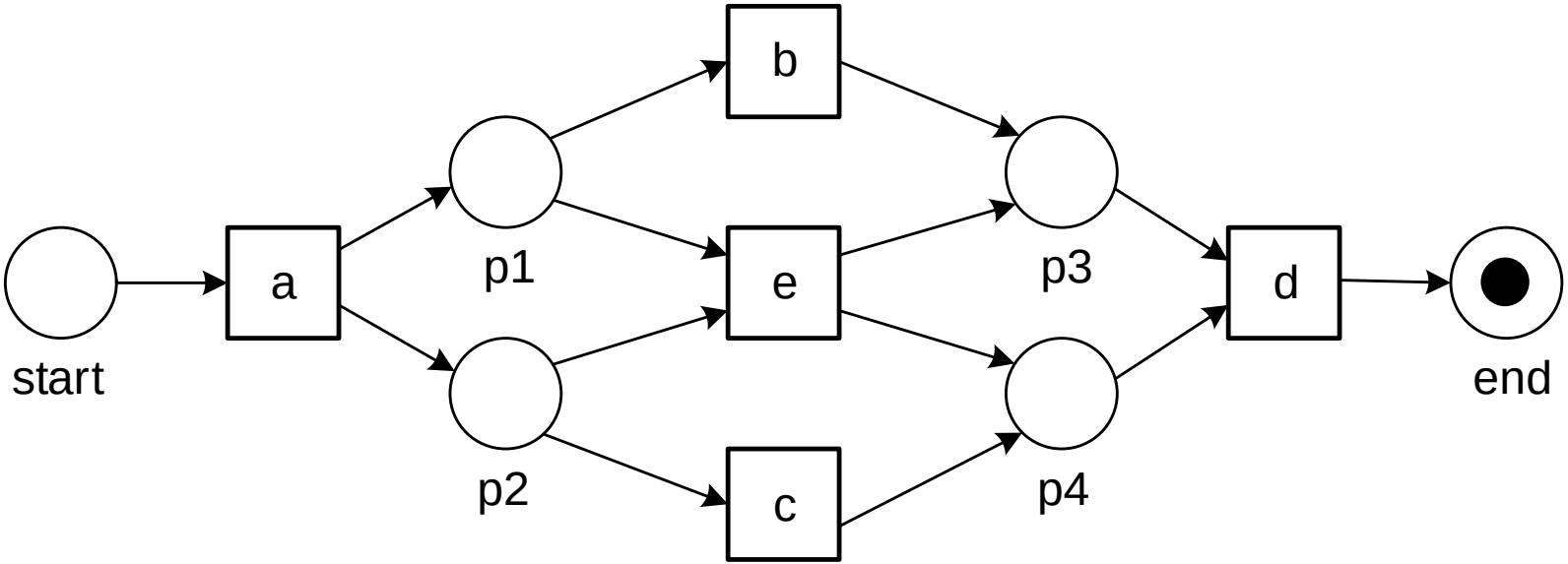
“Playing out”



<a,c,b,d>

Final marking

Process Discovery

Given some traces, can you come up with a Petri net that can replay all of them?

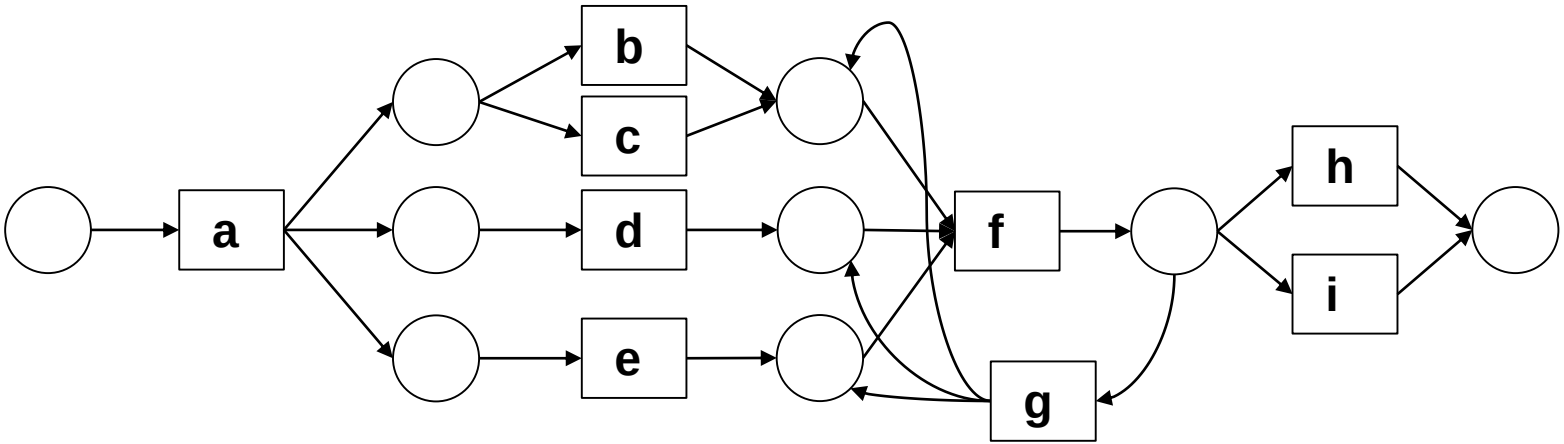
<a,b,d,e,f,h>

<a,e,c,d,f,g,f,i>

<a,d,e,b,f,g,f,g,f,h>

Process Discovery: solution

<a,b,d,e,f,h> <a,e,c,d,f,g,f,i> <a,d,e,b,f,g,f,g,f,h>



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