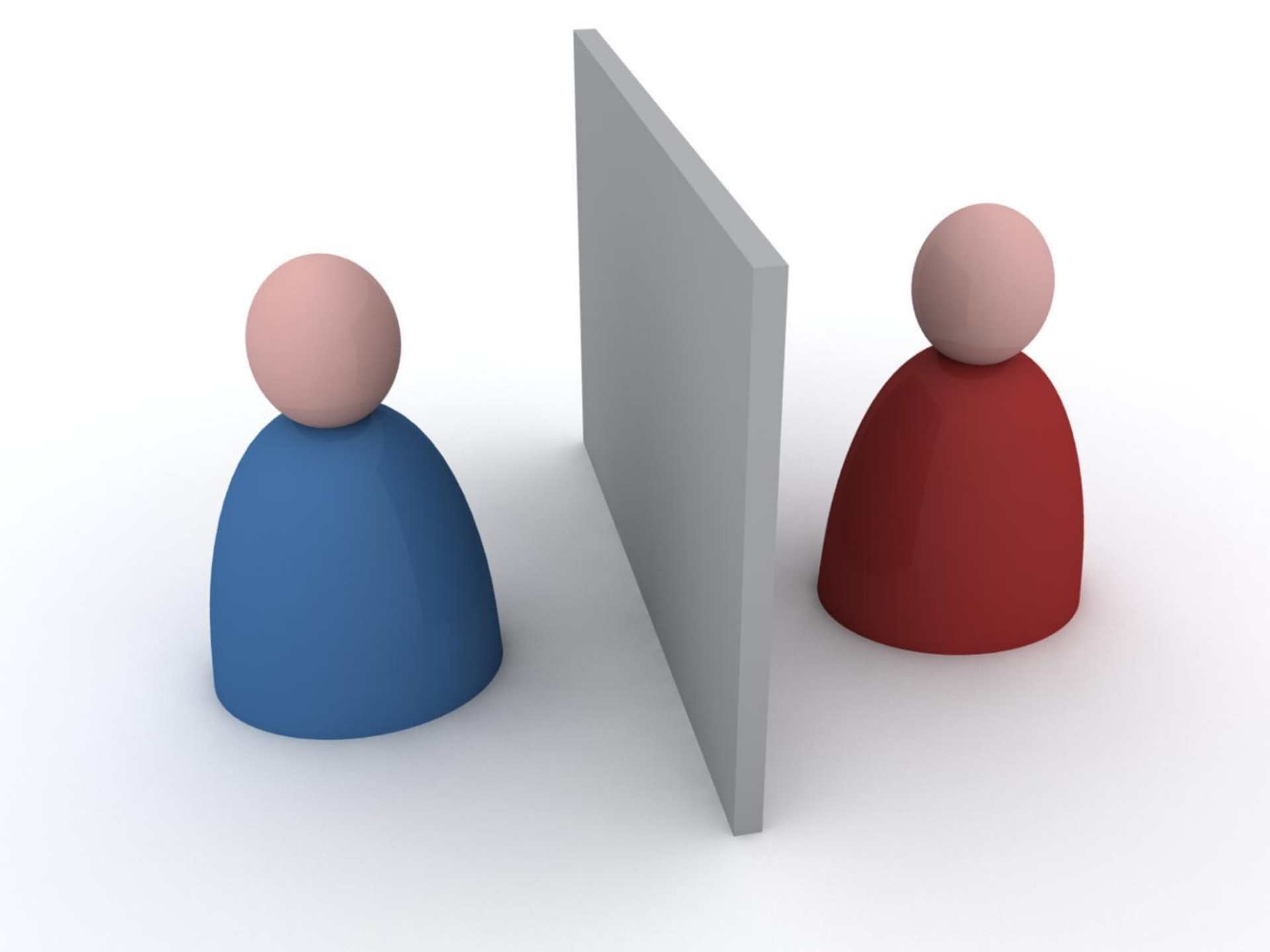
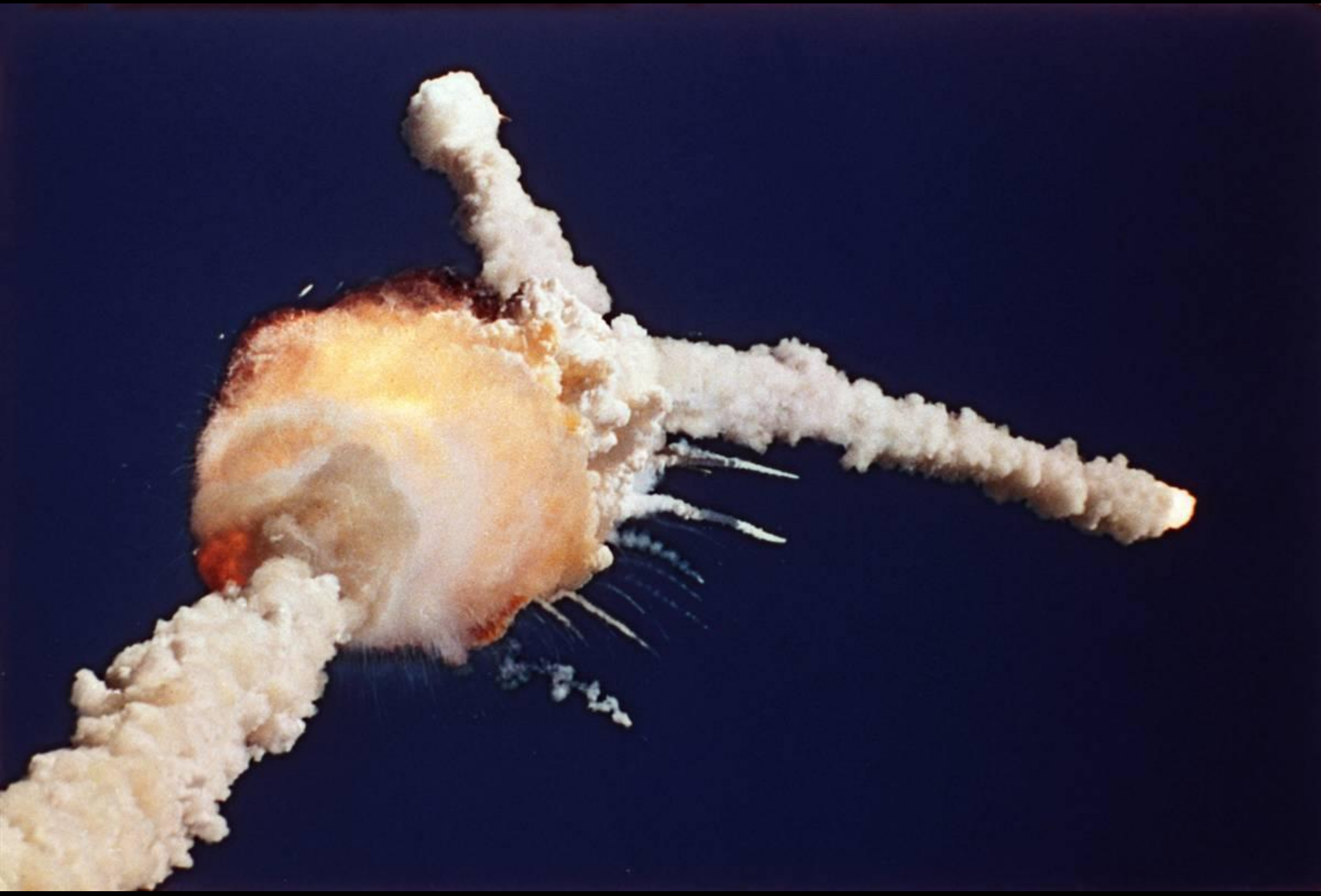
Applying Model Based Testing

Axini’s MBT approach





Whoami

axini

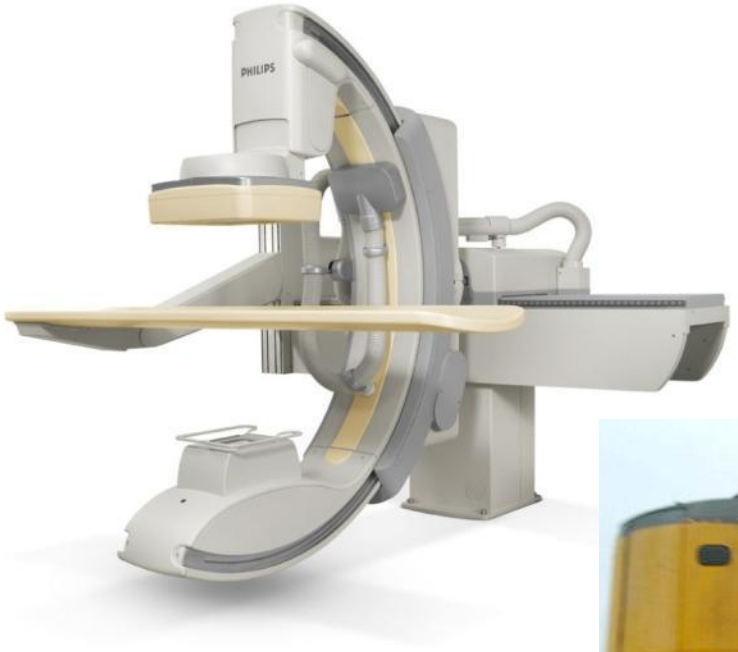
- 73: Machiel van der Bijl
- 96: Computer Scientist
- 96- Utopics, Ordina
- 06- Founder Axini
- 11: PhD UT

Axini

axini

Maker of the best MBT tool in the world

- 2006: me
- 2008: Menno Jonkers and me
- 2014: 10-15 people
- Spin off University of Twente
- 50% Tool development
- 50% Consultancy


PHILIPS


CRAY


LIVE
1
Staines
RICHMOND
0.30
MILES
TOMTOM

Talk is about applying Axini MBT
What do you want to hear?

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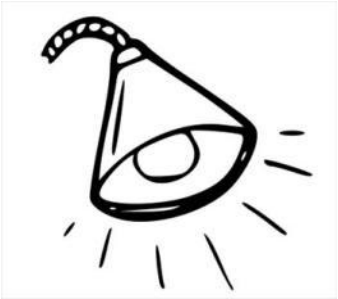
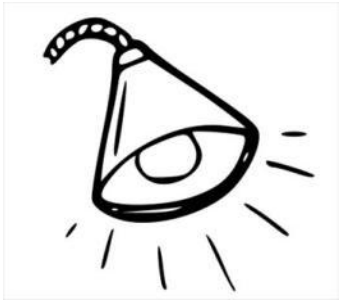
Model-based testing


ON
OFF





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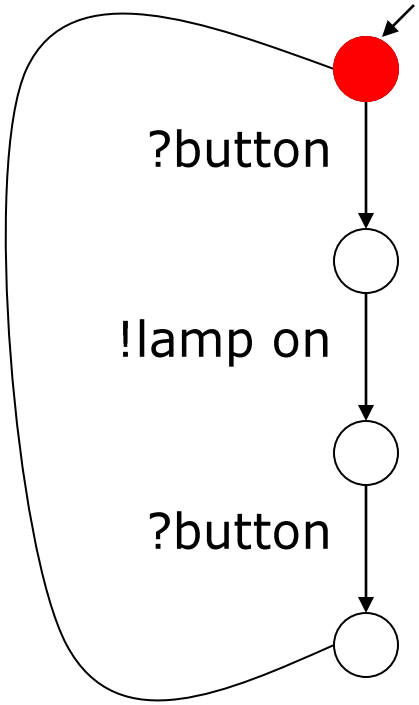

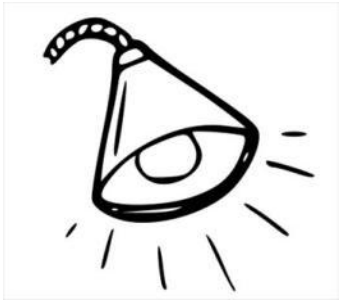

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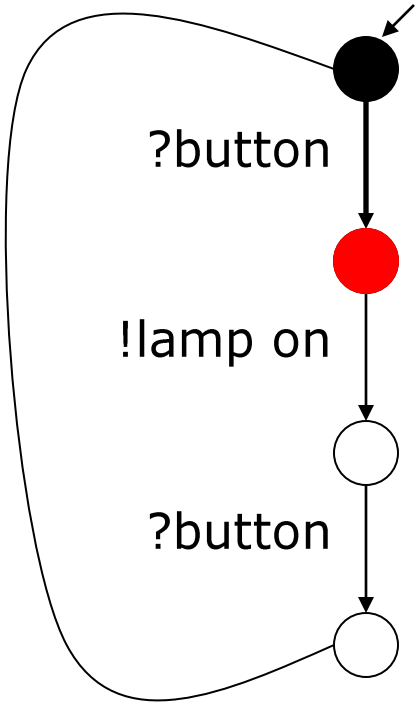

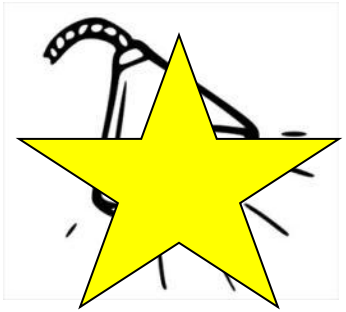

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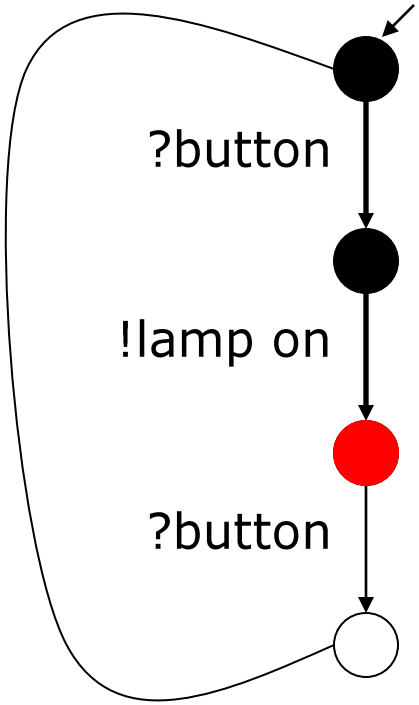

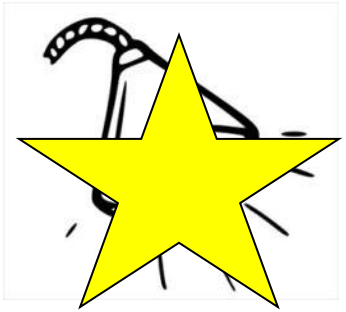

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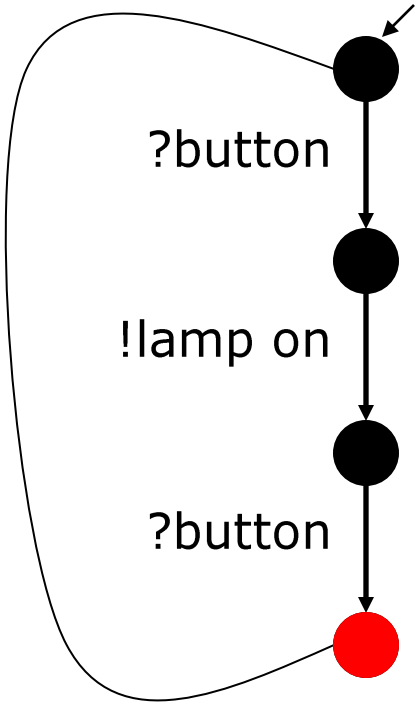
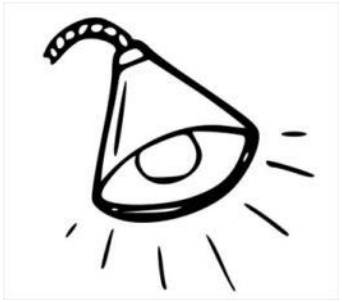
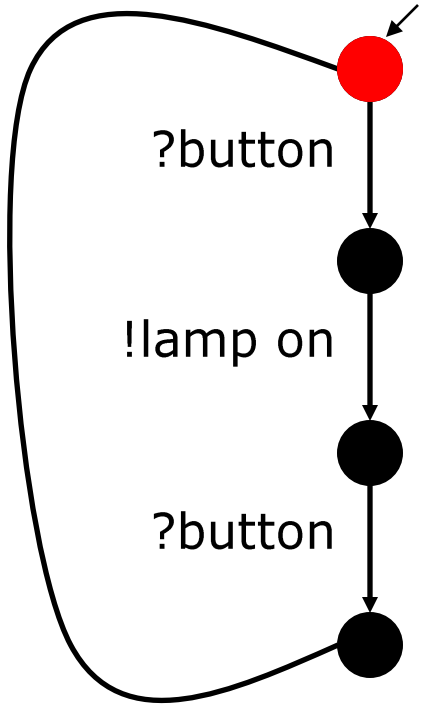






!lamp off

How do you write models?

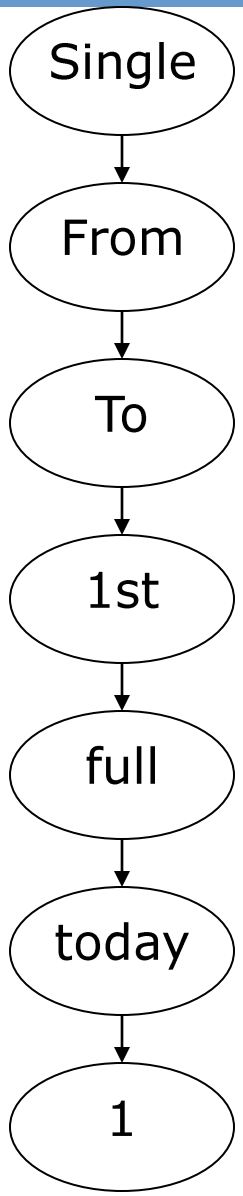
Axini uses a Domain Specific Modeling Language

axini

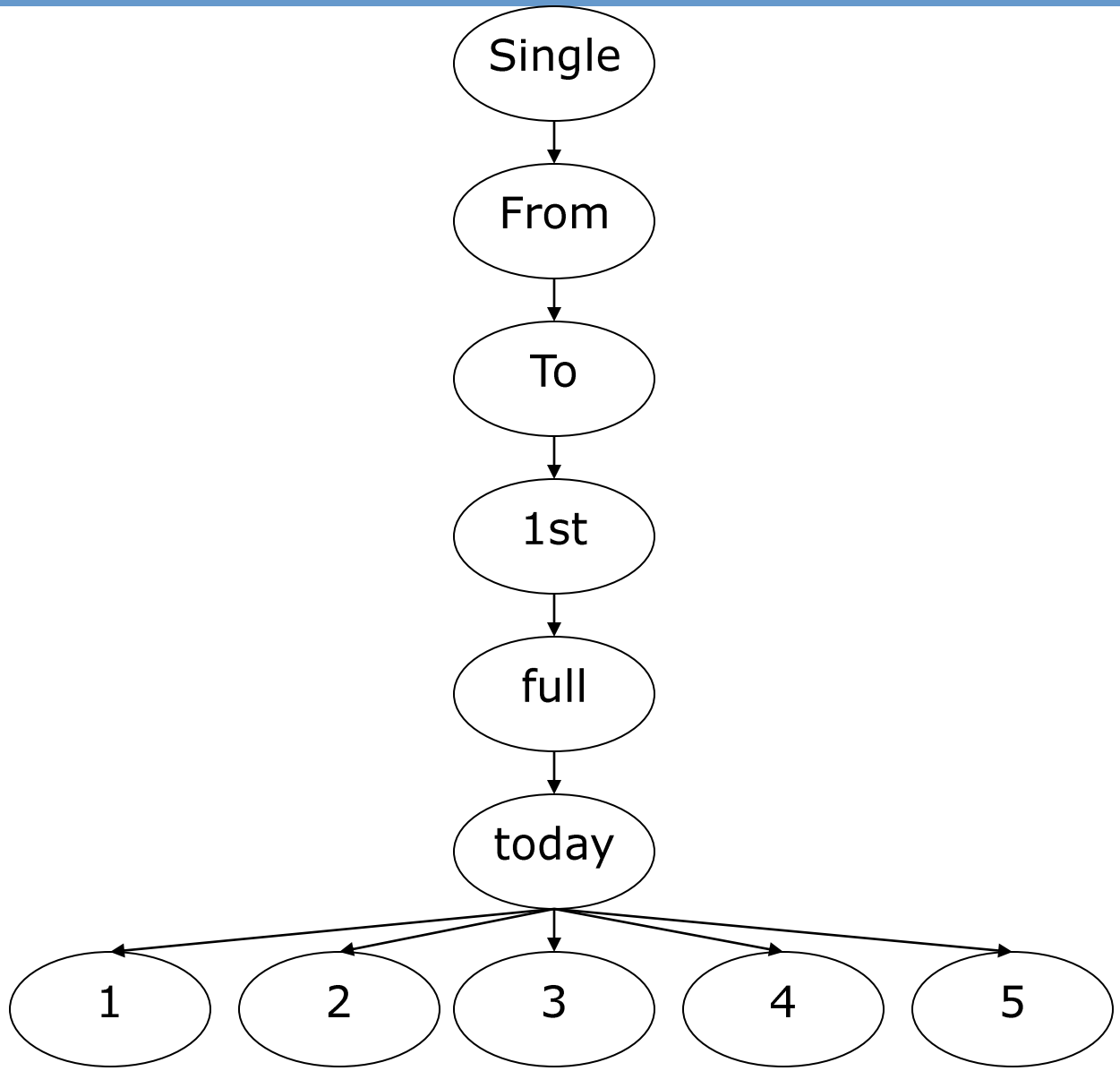
```
def lamp(id)
  button(id)
  lamp(id) on
  button(id)
  lamp(id) off
end

process = lamp(1) || lamp(2)
```


Single
From:
Rotterdam Centraal
1st class
Full fare
Valid today
1 ticket
Day Return
To:
Amsterdam Centraal
2nd class
Discount
Open date
2 tickets
5 Return ticket
To change route: press a white box above.
3 tickets
Weekend Return
4 tickets
Railrunner
4-11 (incl.) years
Select number of tickets
Other tickets
'Via' station
Nederlands
English
Stop
Clear all

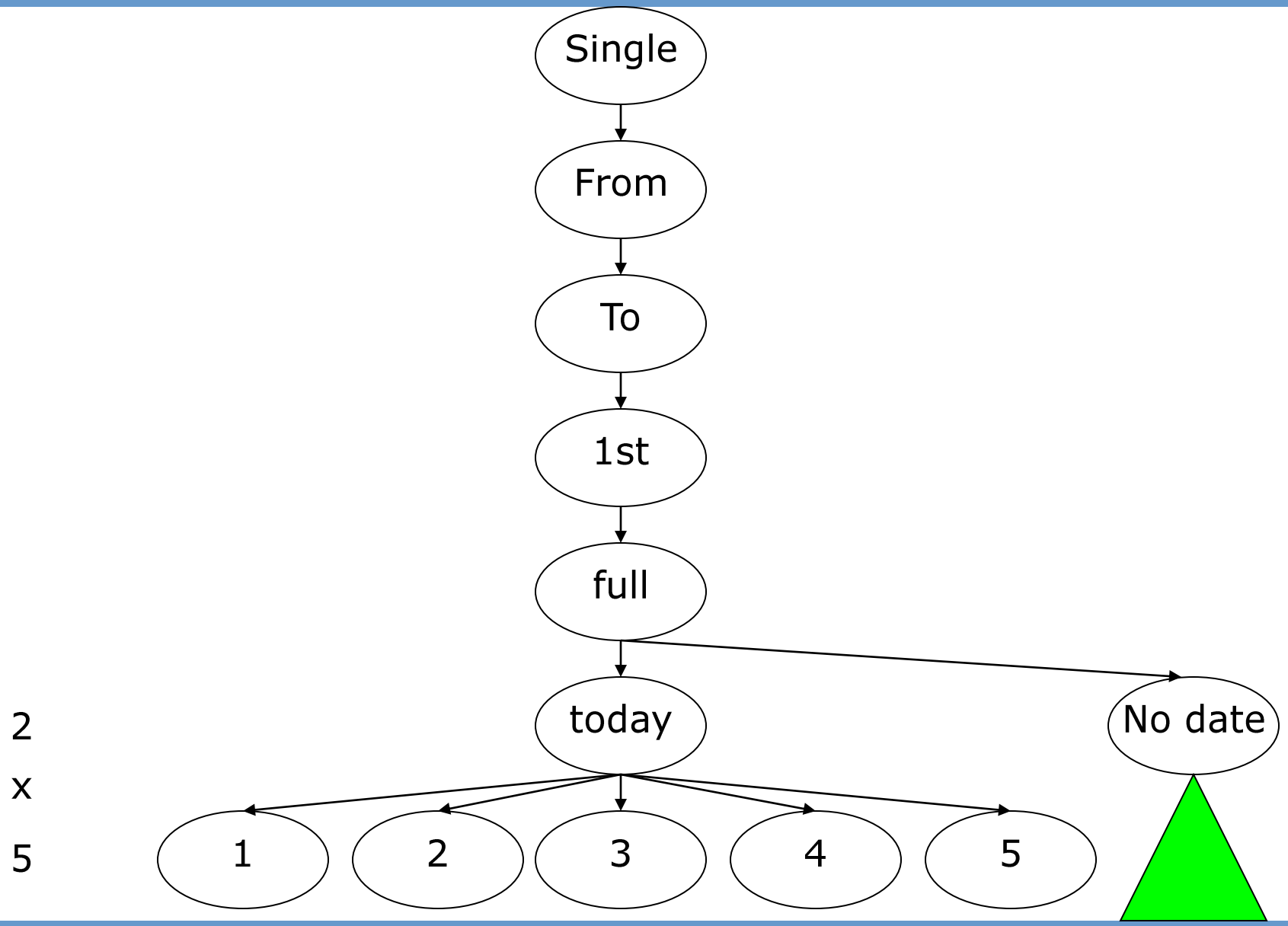
Test case 1



Test case 1-5



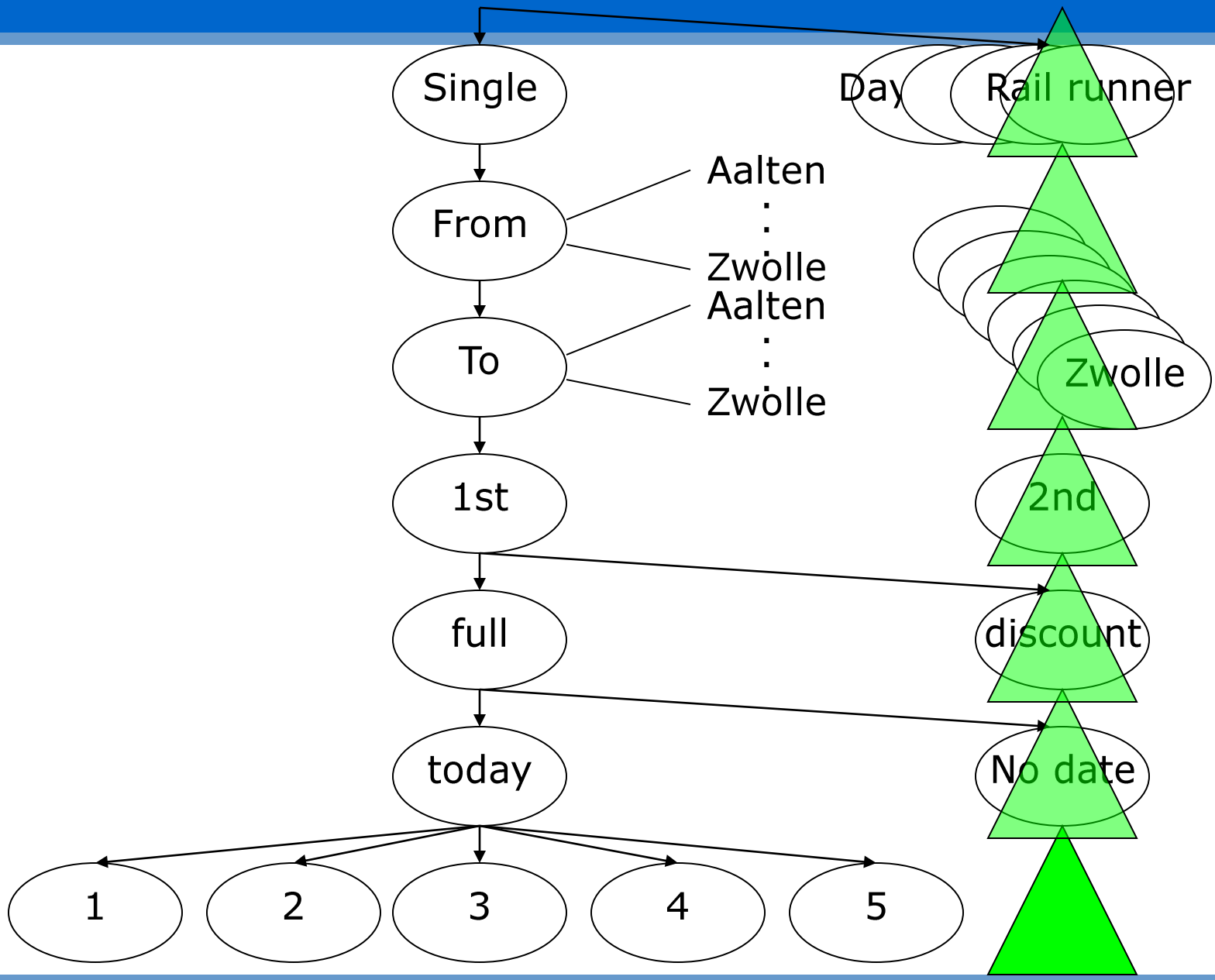
Test case 1-10



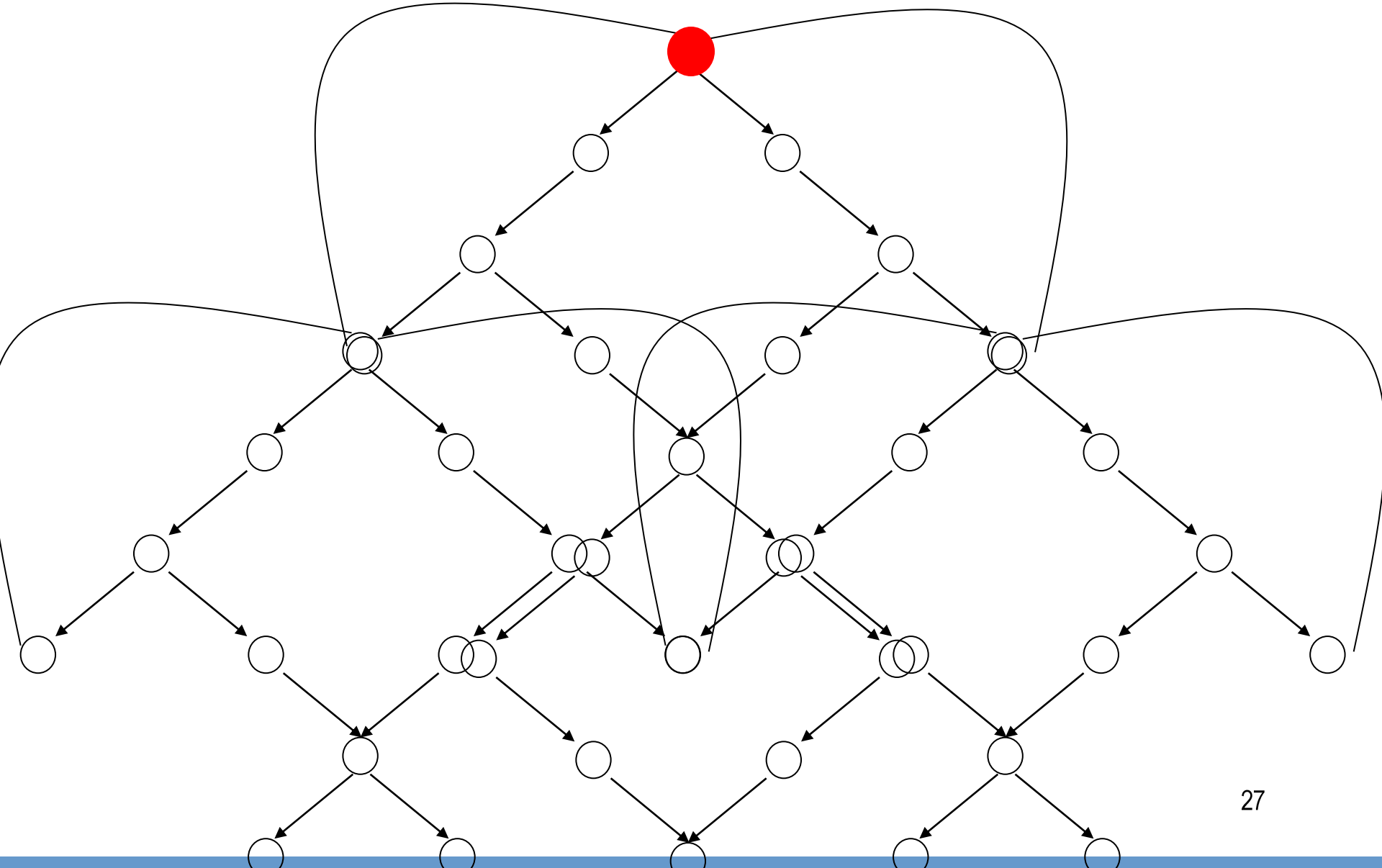
Test case 1-30732800

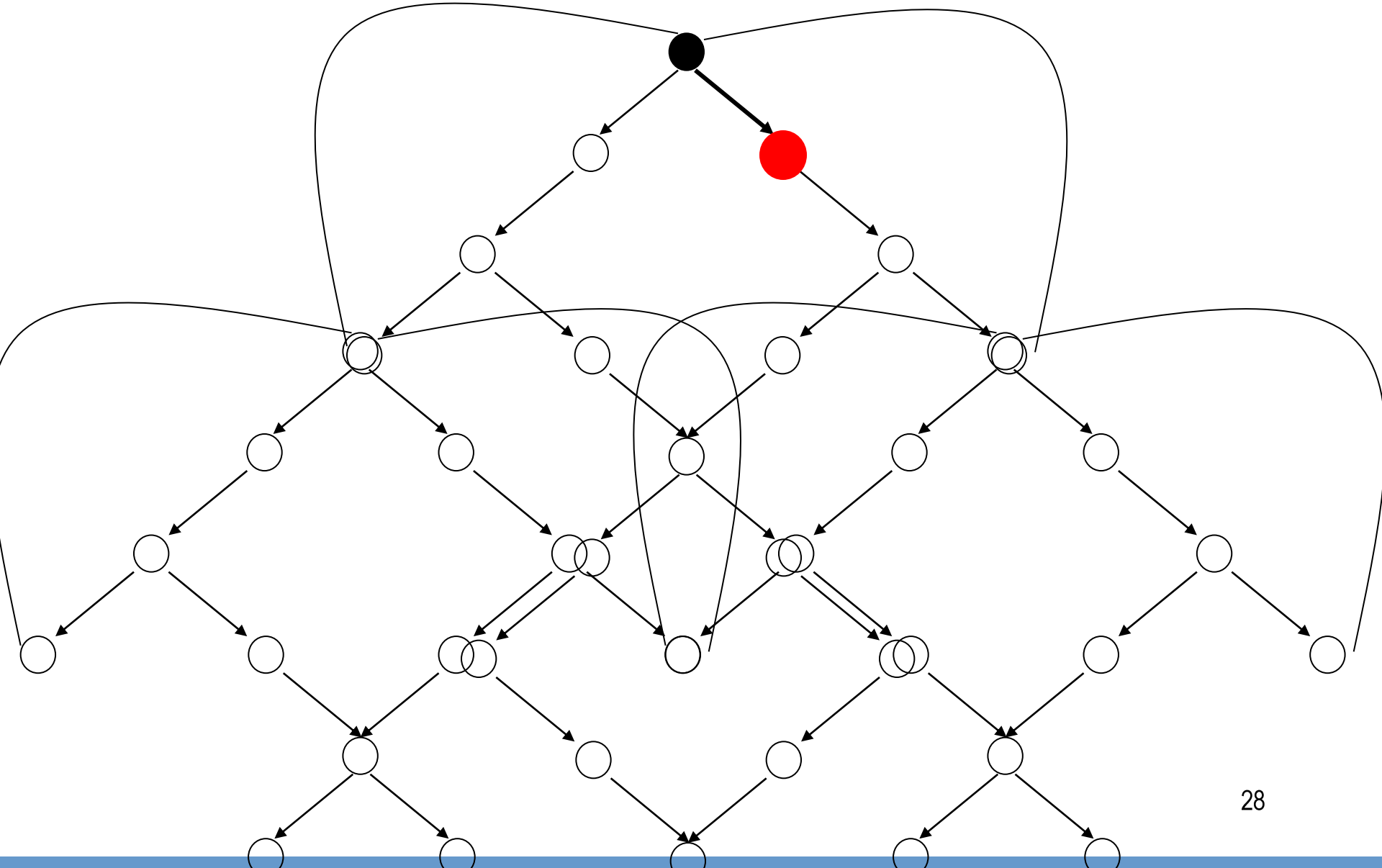
axini

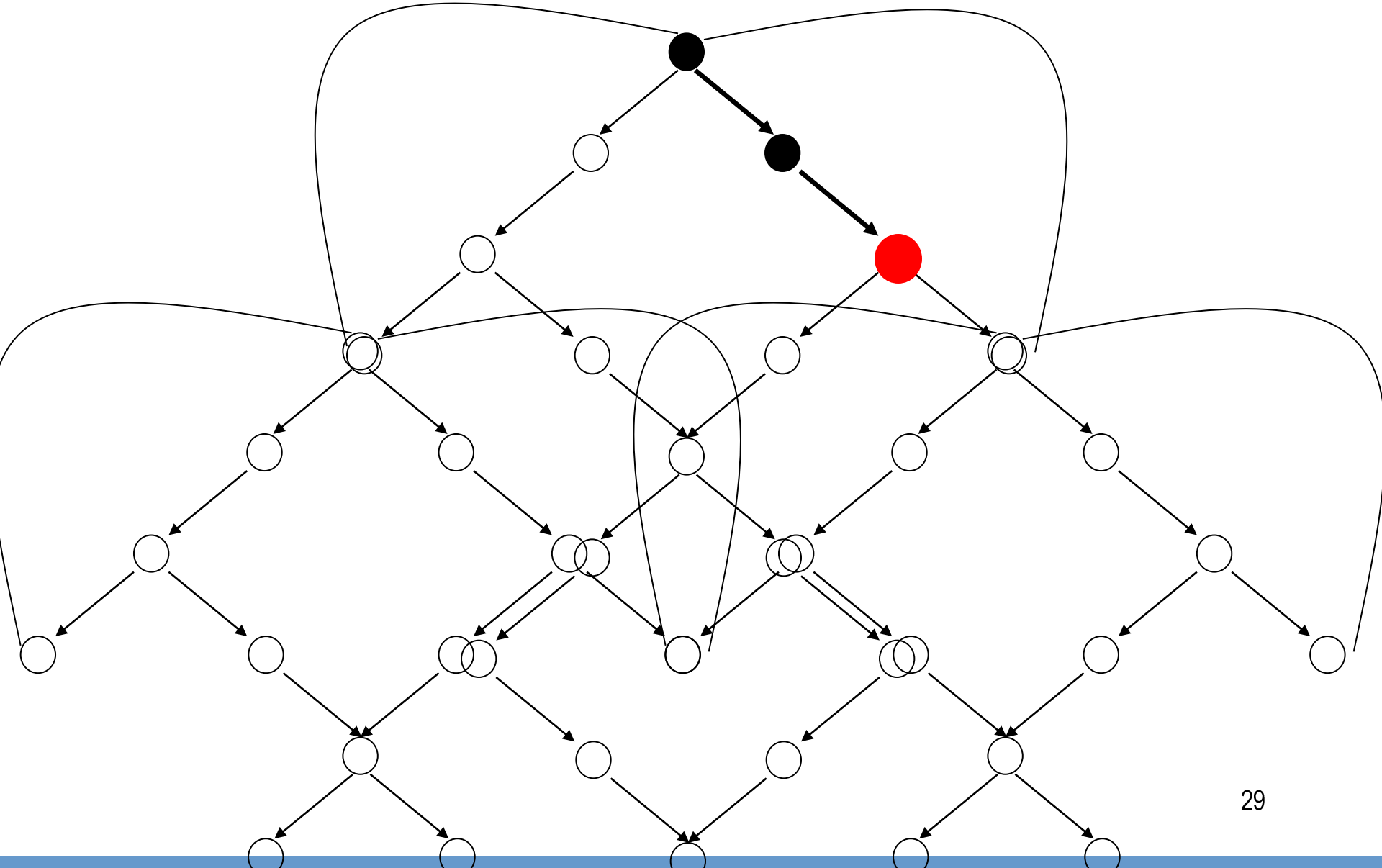
5
x
392
x
392
x
2
x
2
x
2
x
5
= 30732800

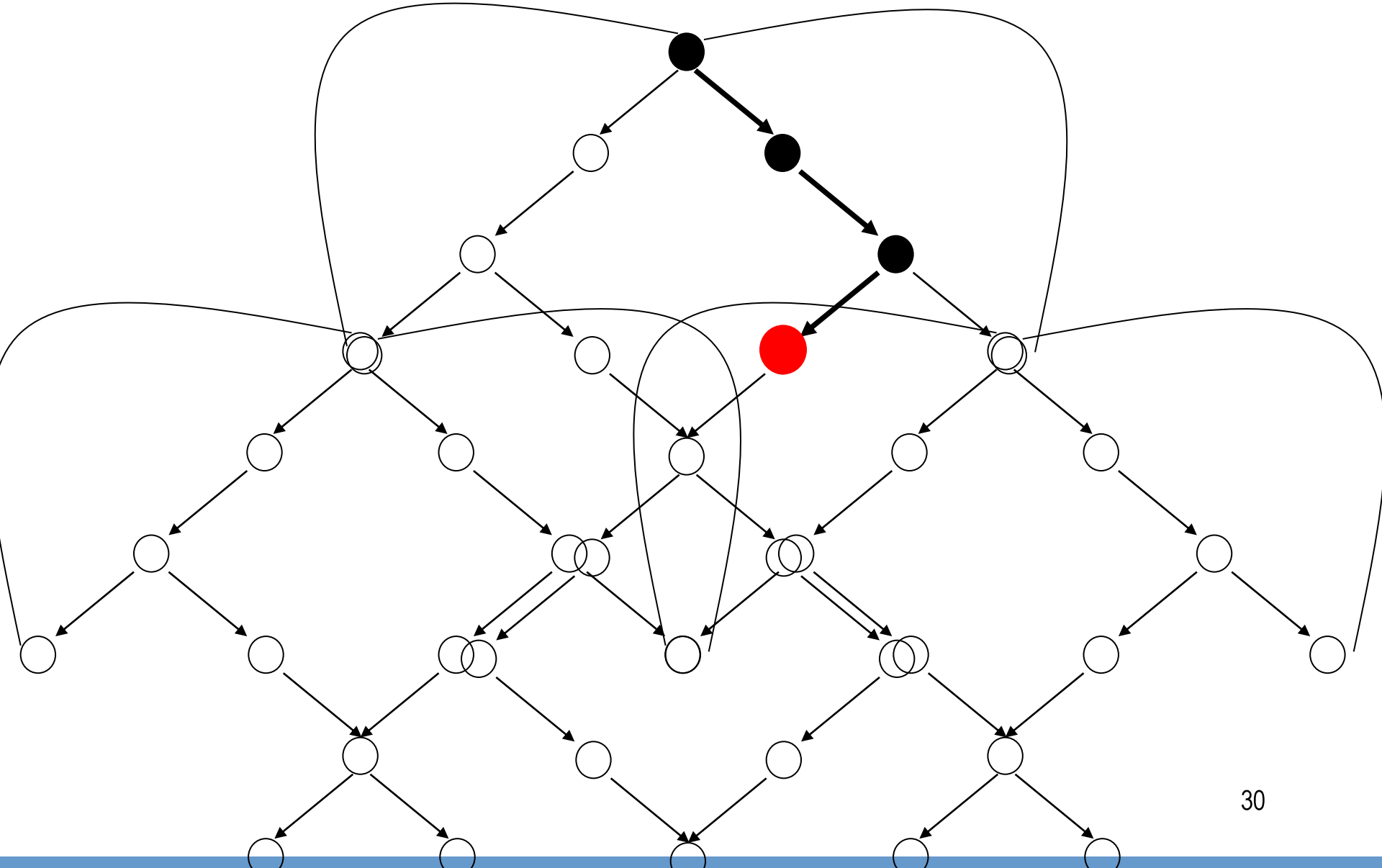


How do you handle data in your model?









How do you know if you have tested enough?

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Questions?

Axini
Model-based testing

Unique features you have seen so far

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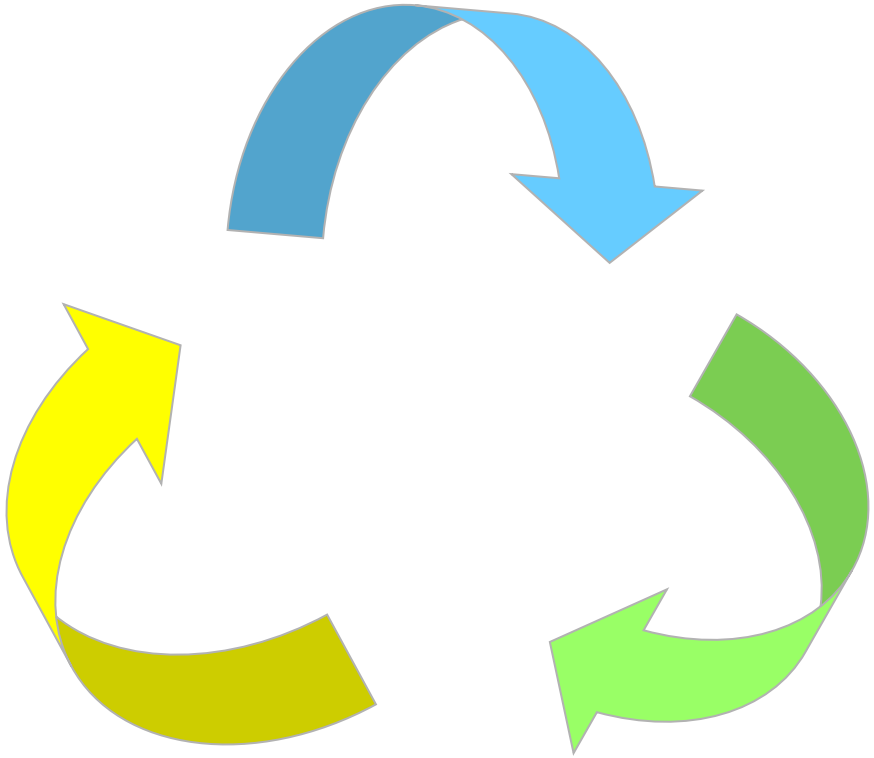
- We write models in a domain specific modeling language
- We support data
- We have coverage based test-selection

100% automation of test process

axini

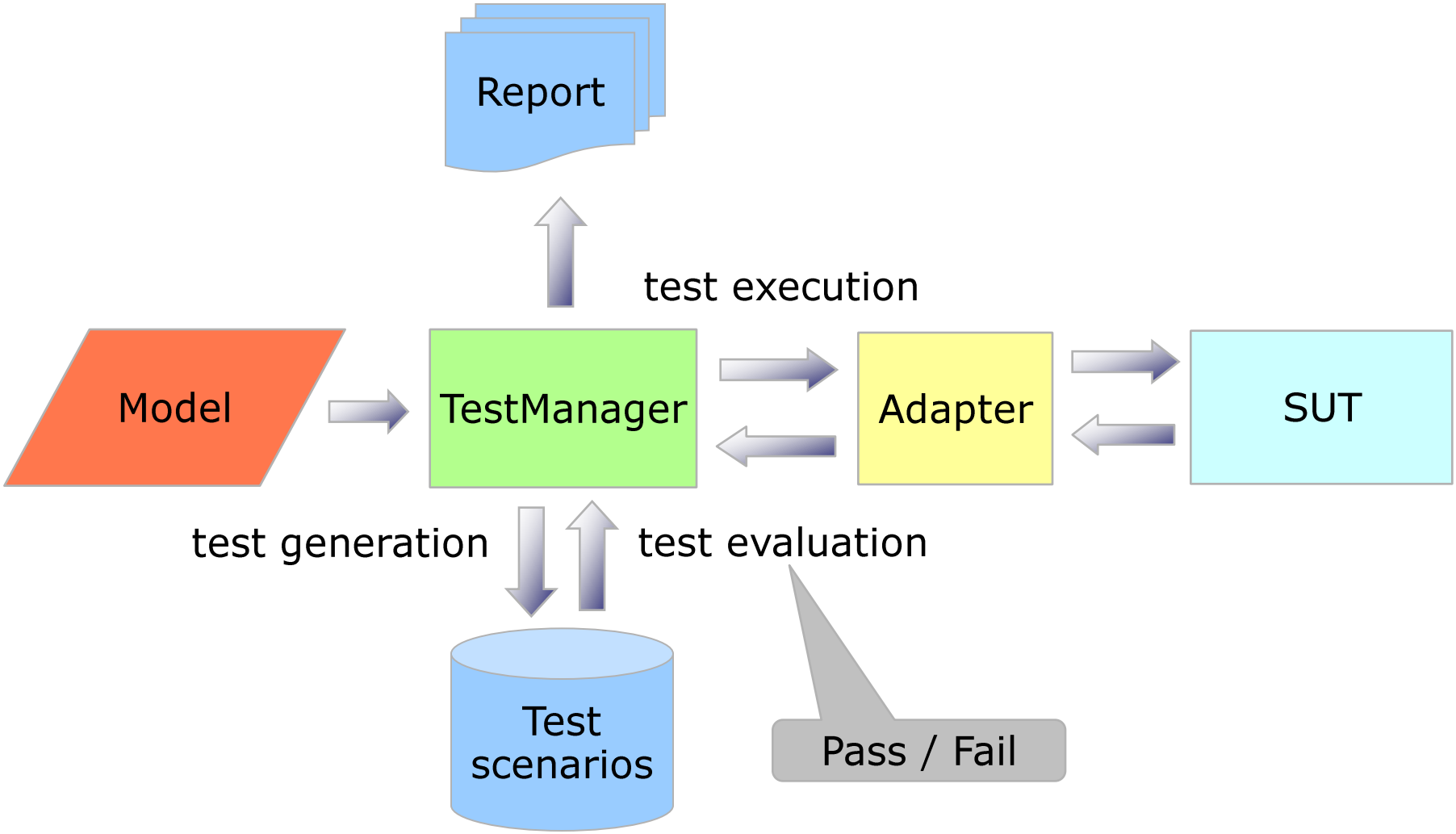
Generation



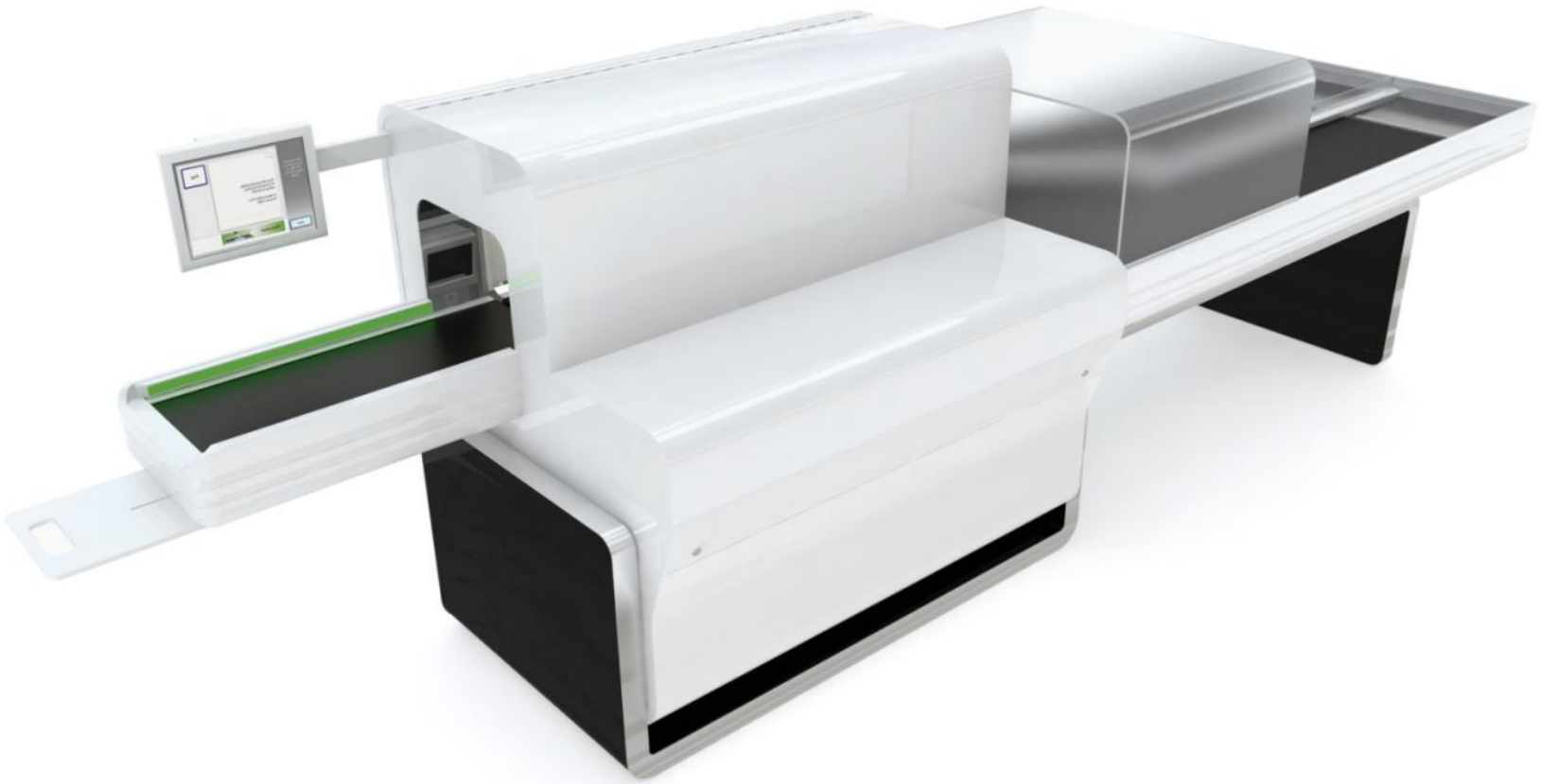
Evaluation

Execution

Architecture

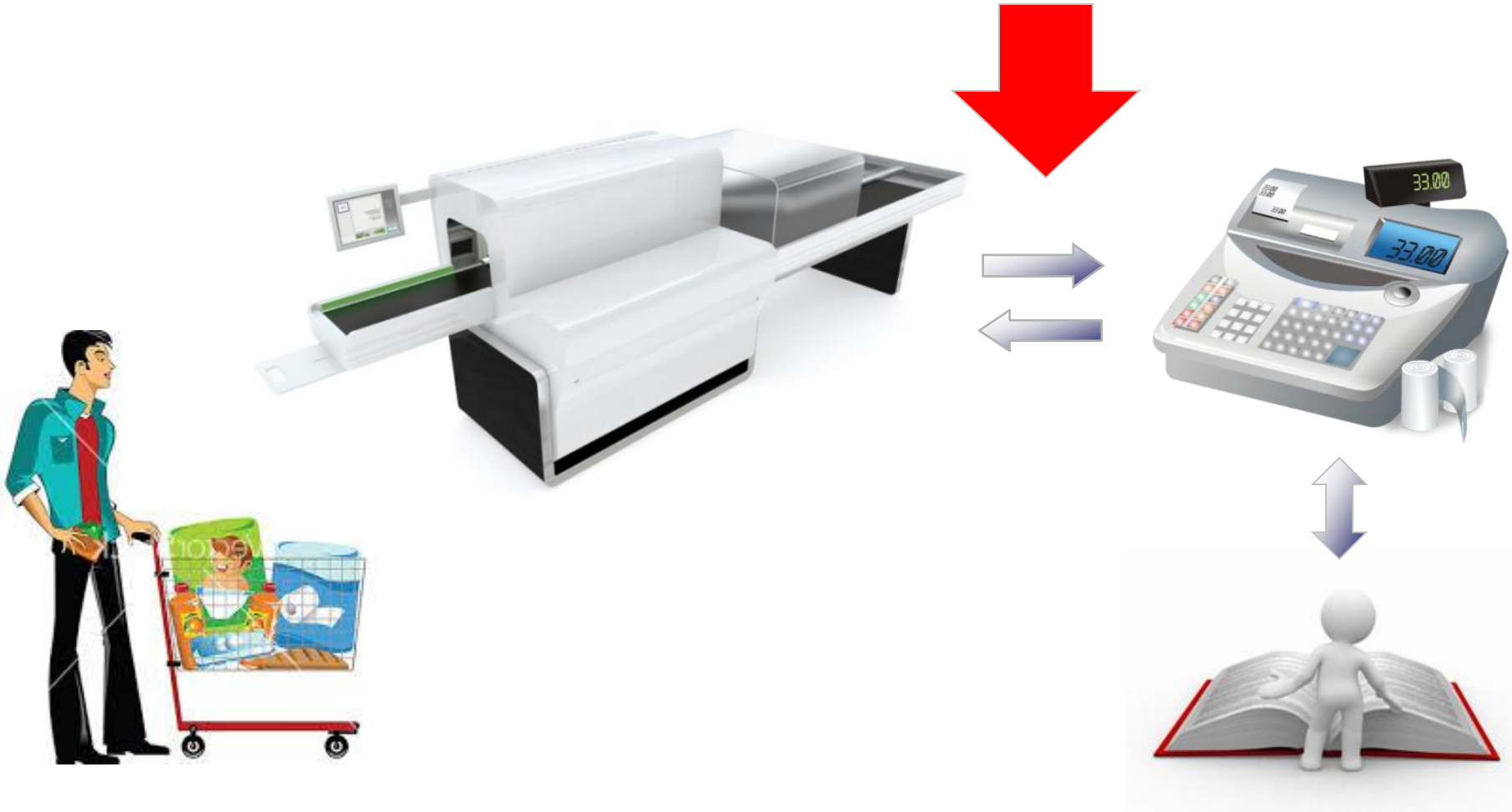


ITAB: Self scan checkout

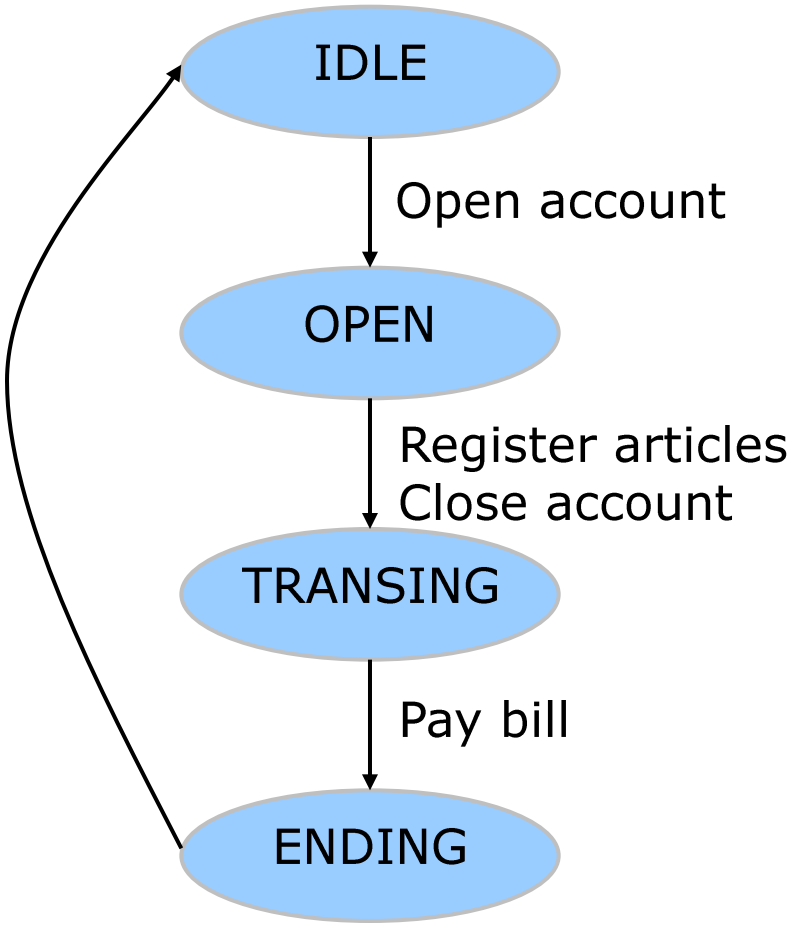


POS communication

axini



Model (simplified)



Model (simplified)

axini

IDLE

Open account

OPEN

Register article
Close account

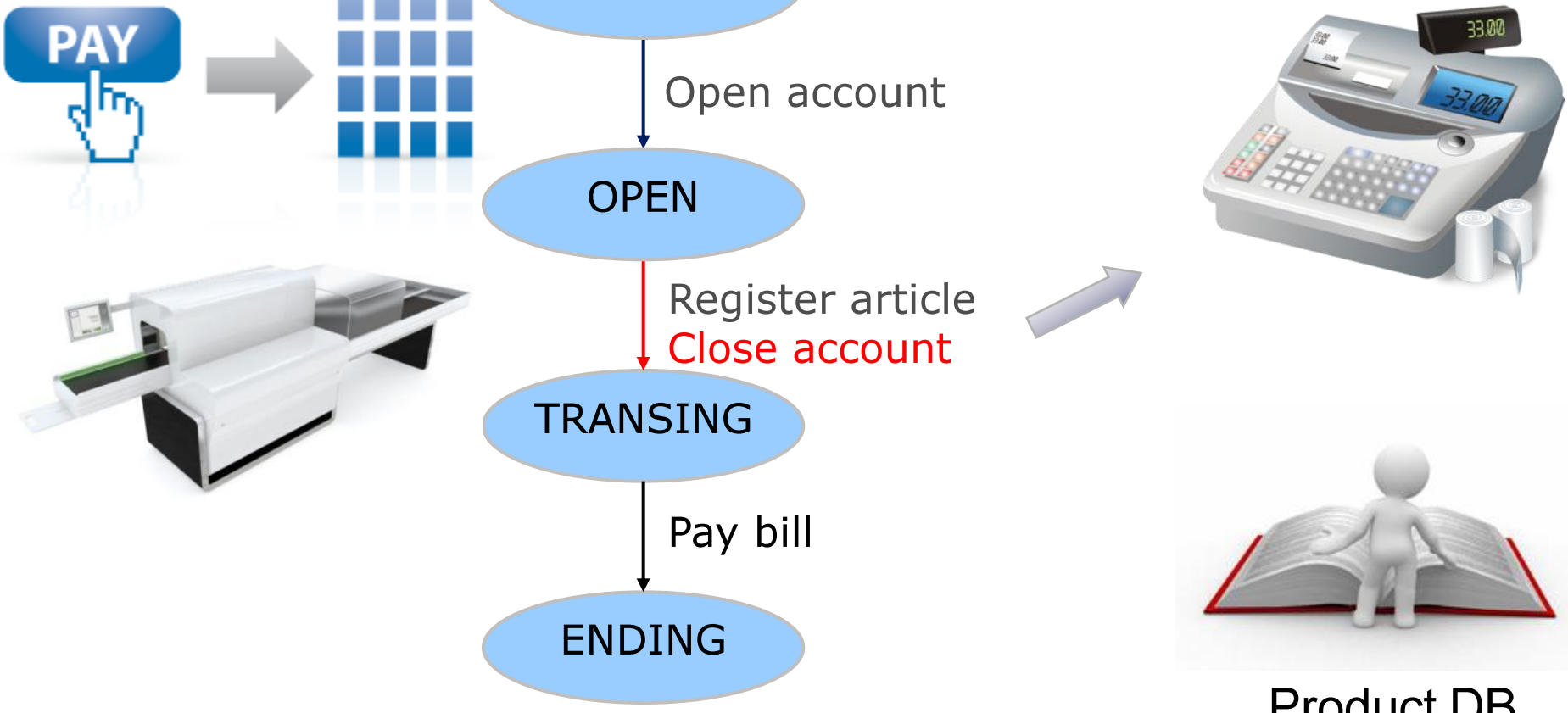
TRANSING

Pay bill

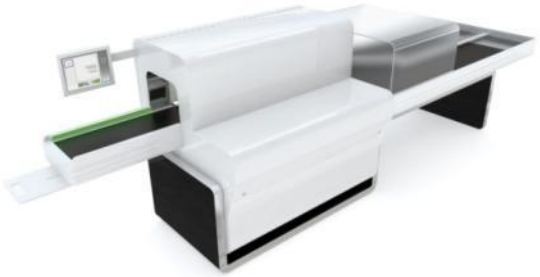
ENDING

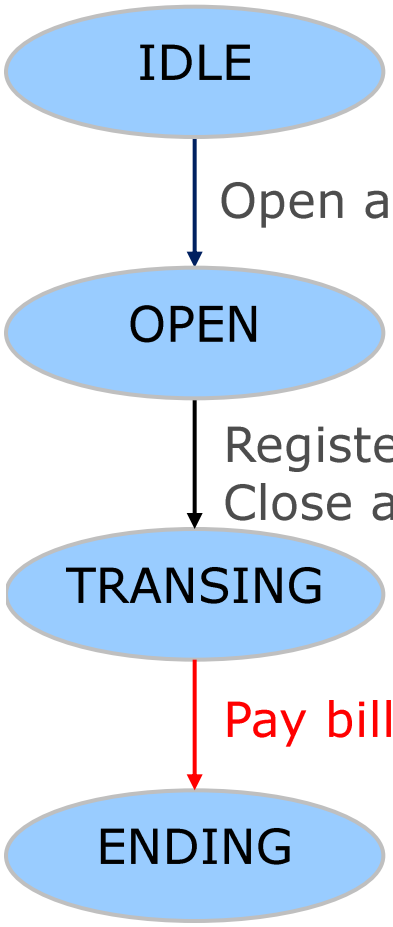
Product DB

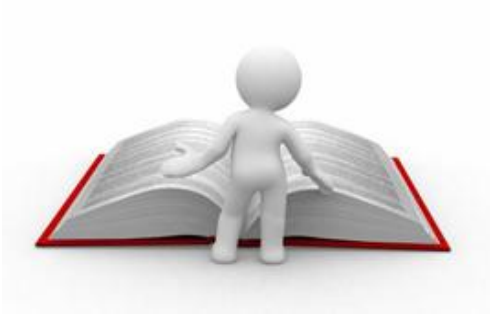
Model (simplified)



Model (simplified)



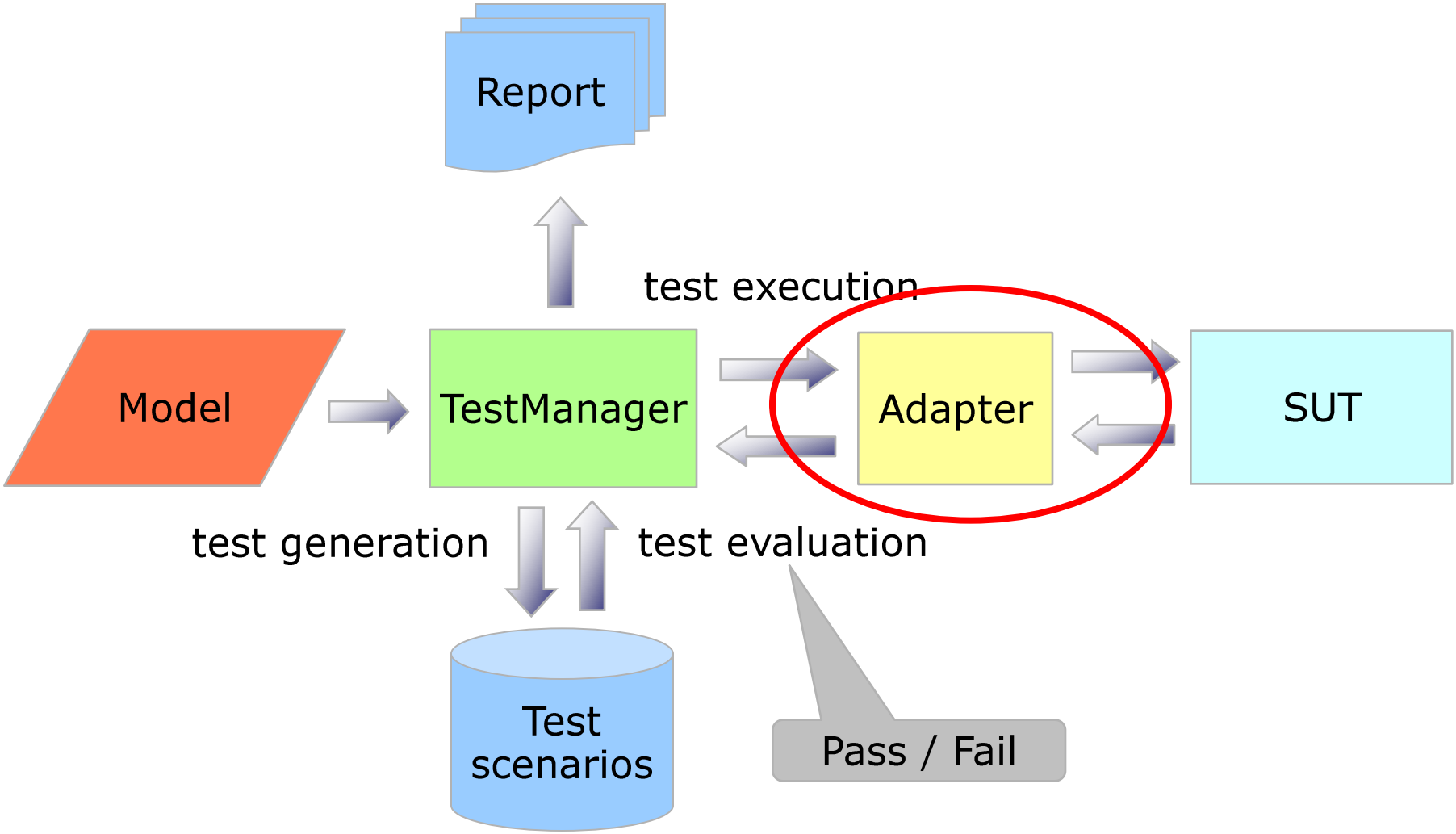




Product DB

Questions before demo?

What did we forget?



Recap

Paper requirements and specification

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ScanFlow is specified on paper

Does not compute

Model: computer readable requirements and specification

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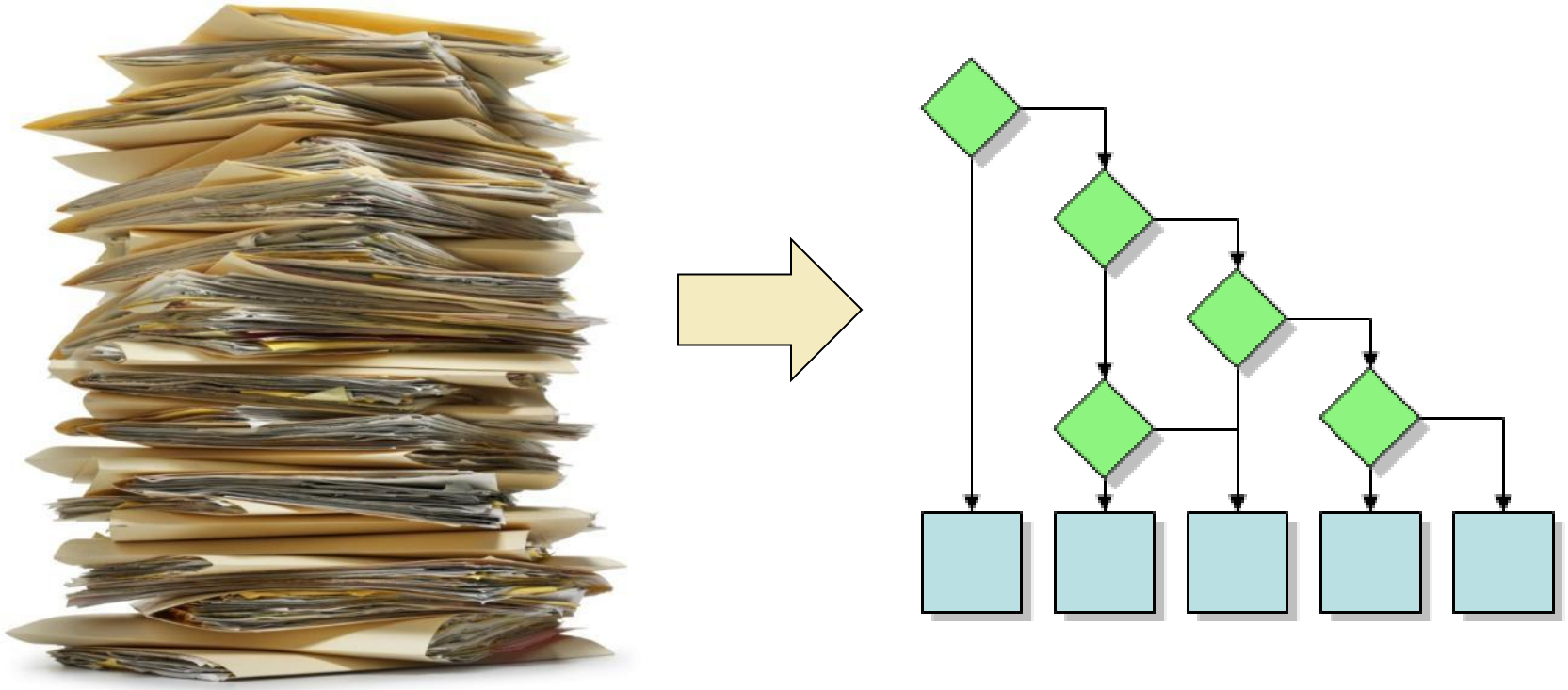
Make a model from the requirements and specification



Adapter

Bad Weather

Conclusion

Axini's MBT approach

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Based on a model we automatically:

- Generate test-cases
- Execute test-cases
- Evaluate the outcome

Unique features

- We write models in a domain specific modeling language
- We support data
- We support time
- We have coverage based test-selection
- We support non-determinism, parallelism, etc

Overview Axini MBT approach

axini

- Thorough, high coverage
- Smart test selection
- Short lead time
- Testing becomes ‘push-button’

Ideal for

- Test often: agile, regression testing
- High cost / long time for testing
- Mission critical systems
- Certification

Without MBT: bugs are found late in the process

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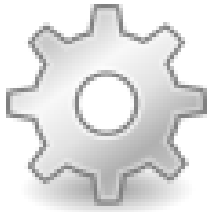
illustratief

Development

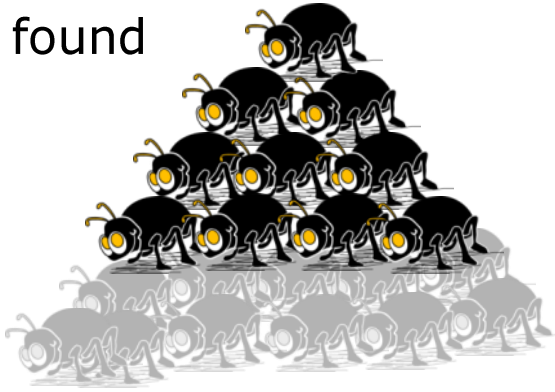


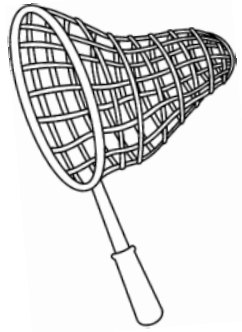
System test

Acceptance test

Production

Bugs found





Hidden bugs, found with MBT

MBT: bugs are detected at development

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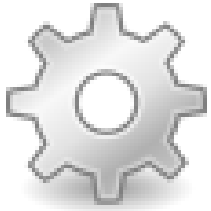
illustratief

Development

MBT

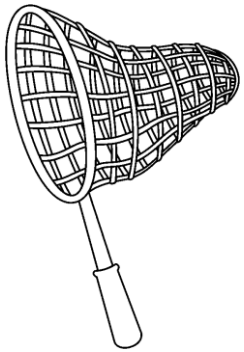


System test

Acceptance test

Production

Bugs found



Without MBT: many and long test/ fix cycles

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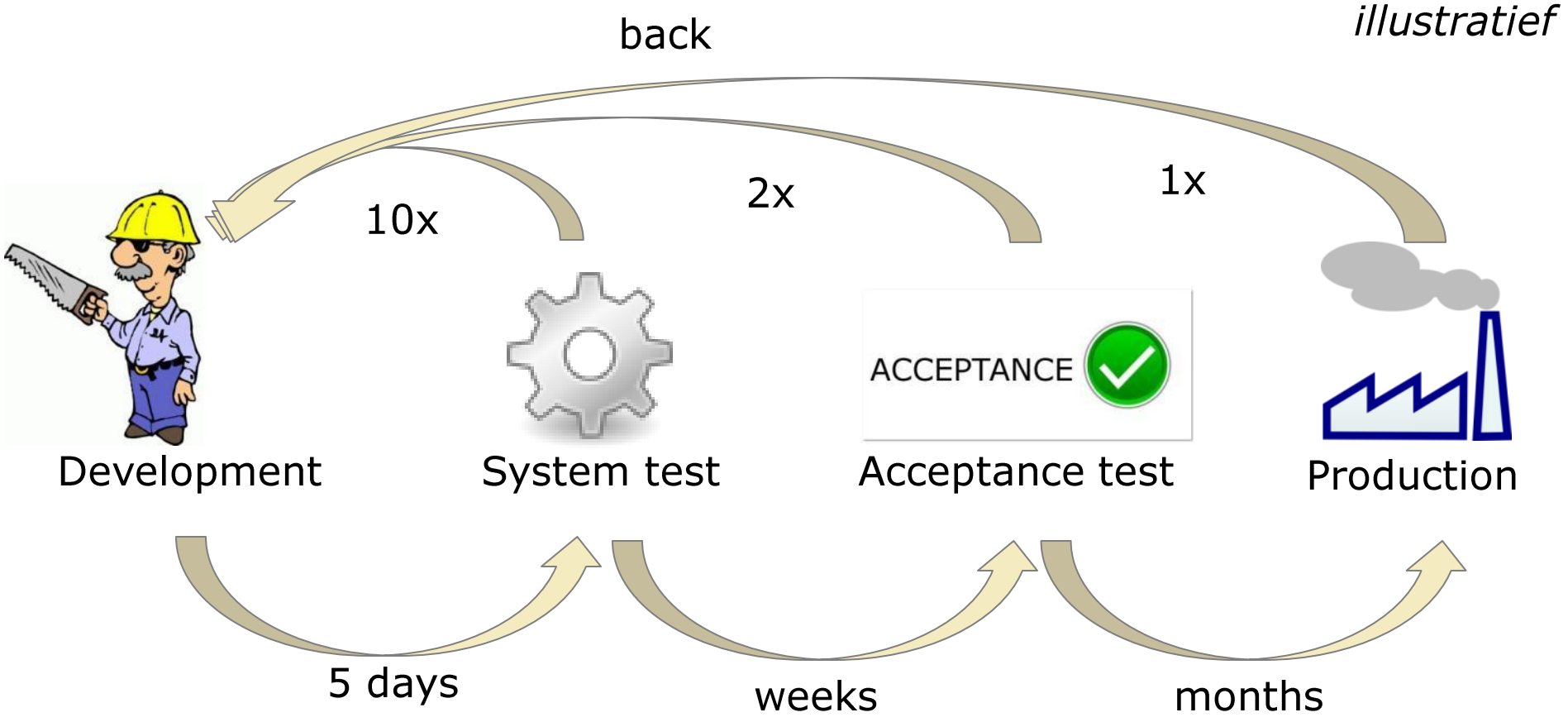
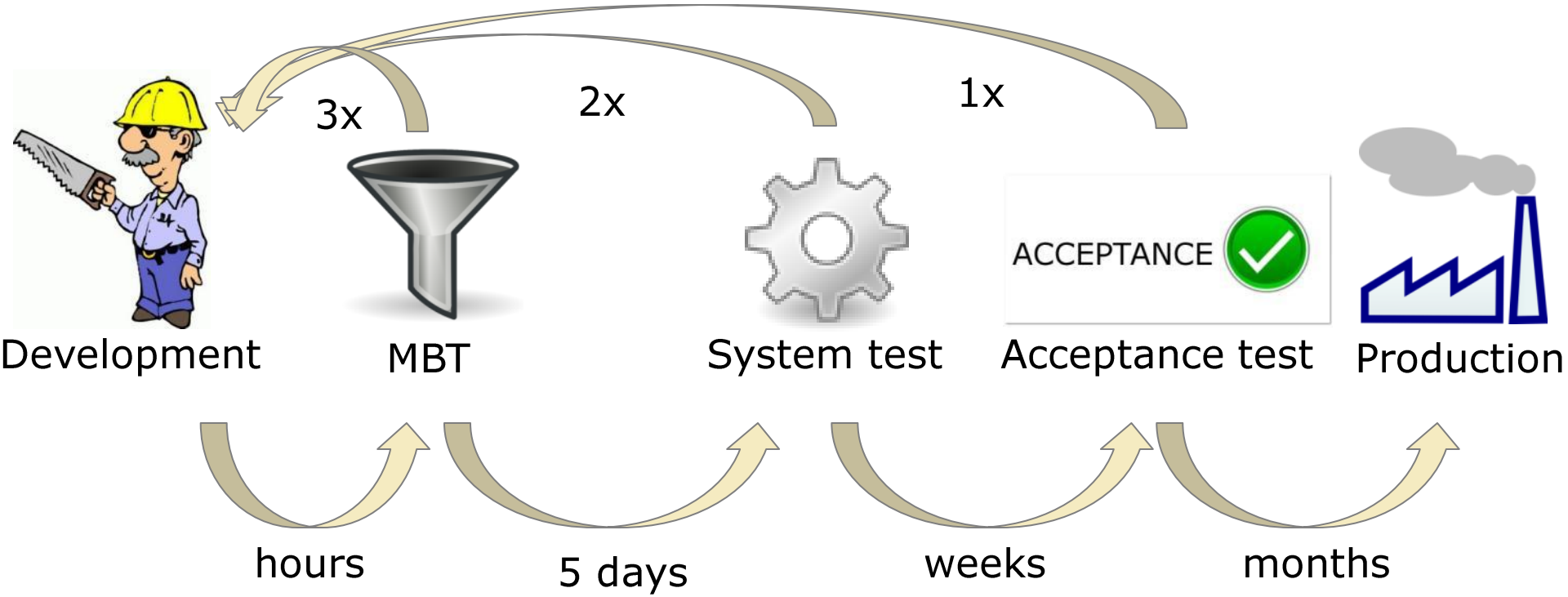
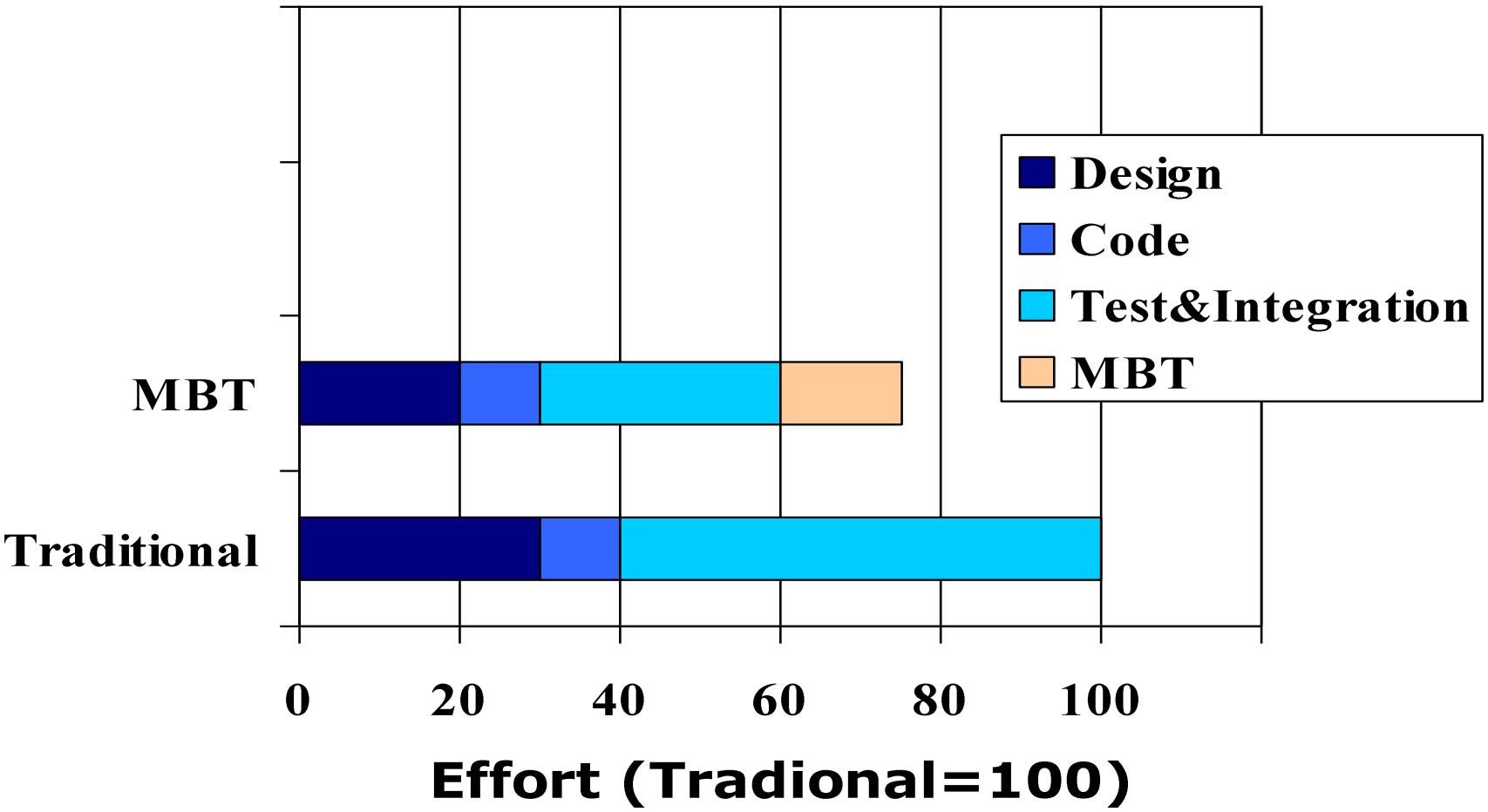


MBT: short test/ fix cycle

illustratief



MBT: Effect on development



Technical effect of MBT

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- Early fault detection in specification
  - Modeling
  - Inspection
  - Simulation
- Early fault detection in implementation
  - Fast and thorough testing
- Ideal for
  - Agile testing, regression testing
  - Mission critical systems
  - Certification

Questions?

Job, graduation project?

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You're very welcome!

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Mail: vdbijl@axini.com