Concordia University
Department of Computer Science and Software Engineering

SOEN 331 - S and U
Introduction to Formal Methods for Software Engineering

Assignment 4 - Solutions

Temporal Logic

Team 19 - Section U

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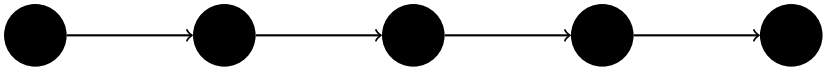
Contents

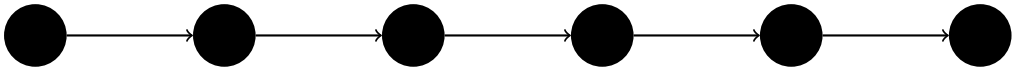
1 Question 1

(1)



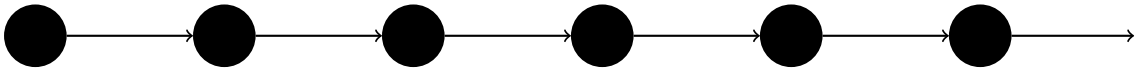
a c e	e	e	e	g

(2)

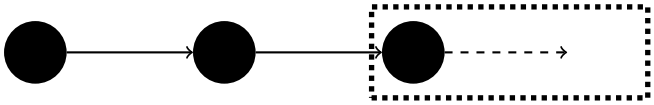


a d	y	y	y	x y	w

(3)

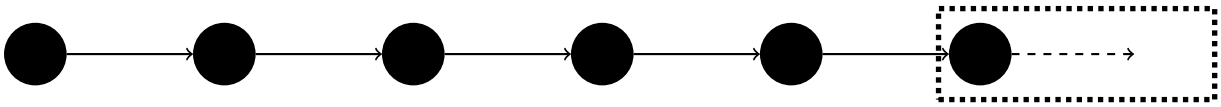


a d	y	y	y	x y	z n



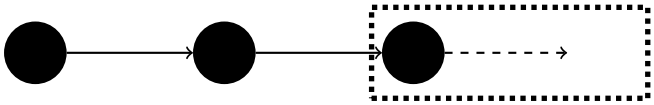
b d	y	y ...

(4)



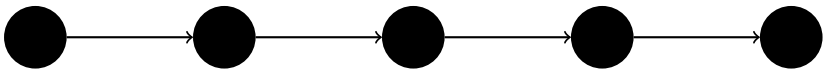
b c	y	y	y	y g	y ...

(5)

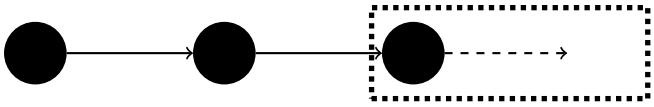


b d	y	y ...

(6)



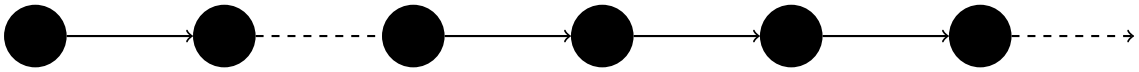
c				g

(7) 

d y y ...

There exists three model's whereby the program terminates, given by the following expressions:
$< (a \wedge c \wedge e),\ e,\ e,\ e,\ g >$
$< (a \wedge d),\ y,\ y,\ y,\ (x \wedge y),\ w >$
$< c,\ \varnothing,\ \varnothing,\ \varnothing,\ g >$

2 Question 2

(1) 

ϕ ϕ ...
ψ
or ψ
or ψ

If ϕ is an invariant, then ψ is true in some moment in time.

(2) 

ϕ ϕ ϕ ...
ψ ψ ...
or ψ ψ ...
or ψ ψ ...

If ϕ is an invariant, then from $i+1$ onwards, ψ could become an invariant.

(3)

(4)

(5)

(6)

(7)

(8)