High State Machine:

s0

!goi

goi

s1

x = xi; y = yi; z = 0
diff = x-y
diff2 = diff

s2

diff > 0

s3

diff > 10

!(diff>10)

!(diff > 0)
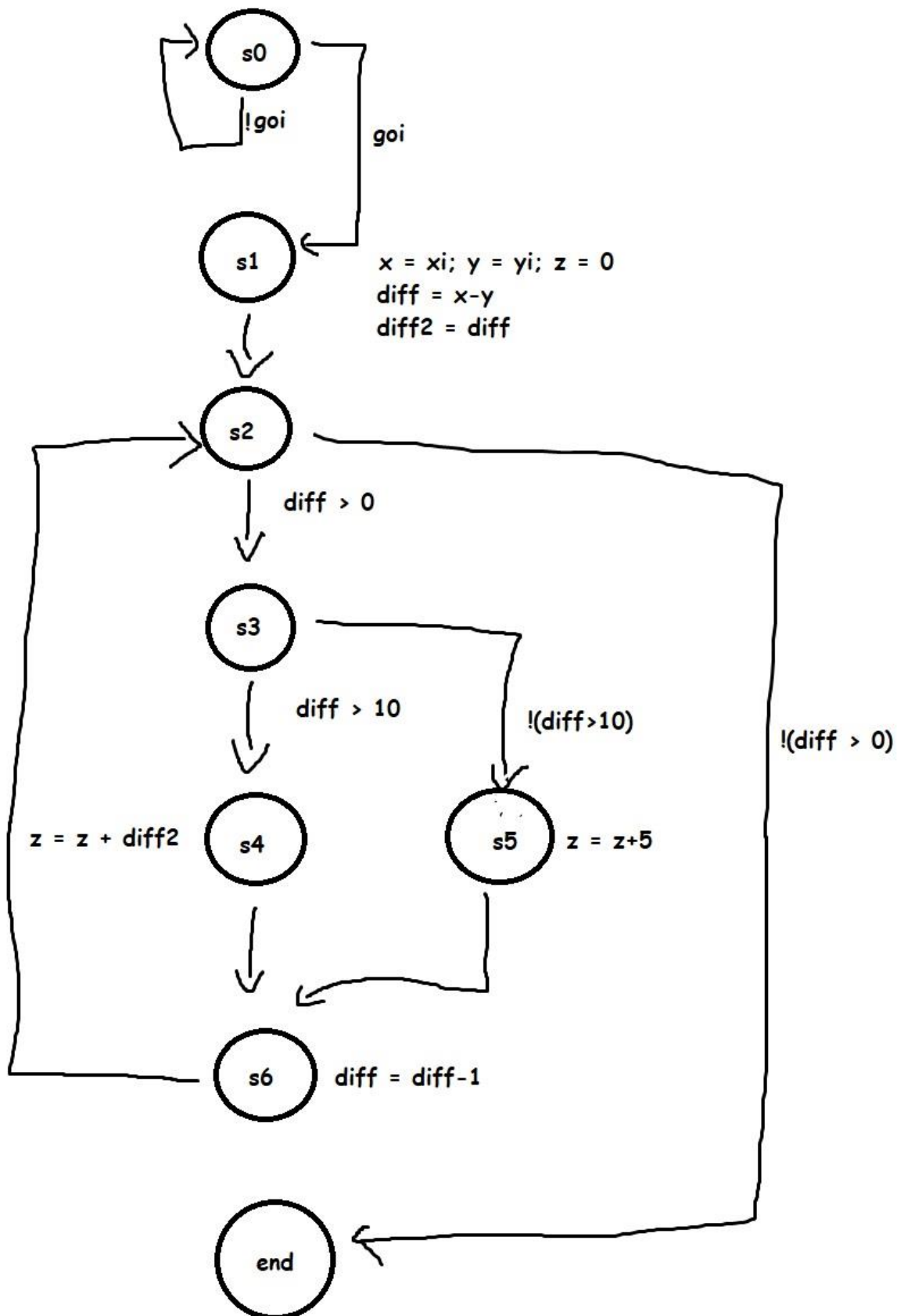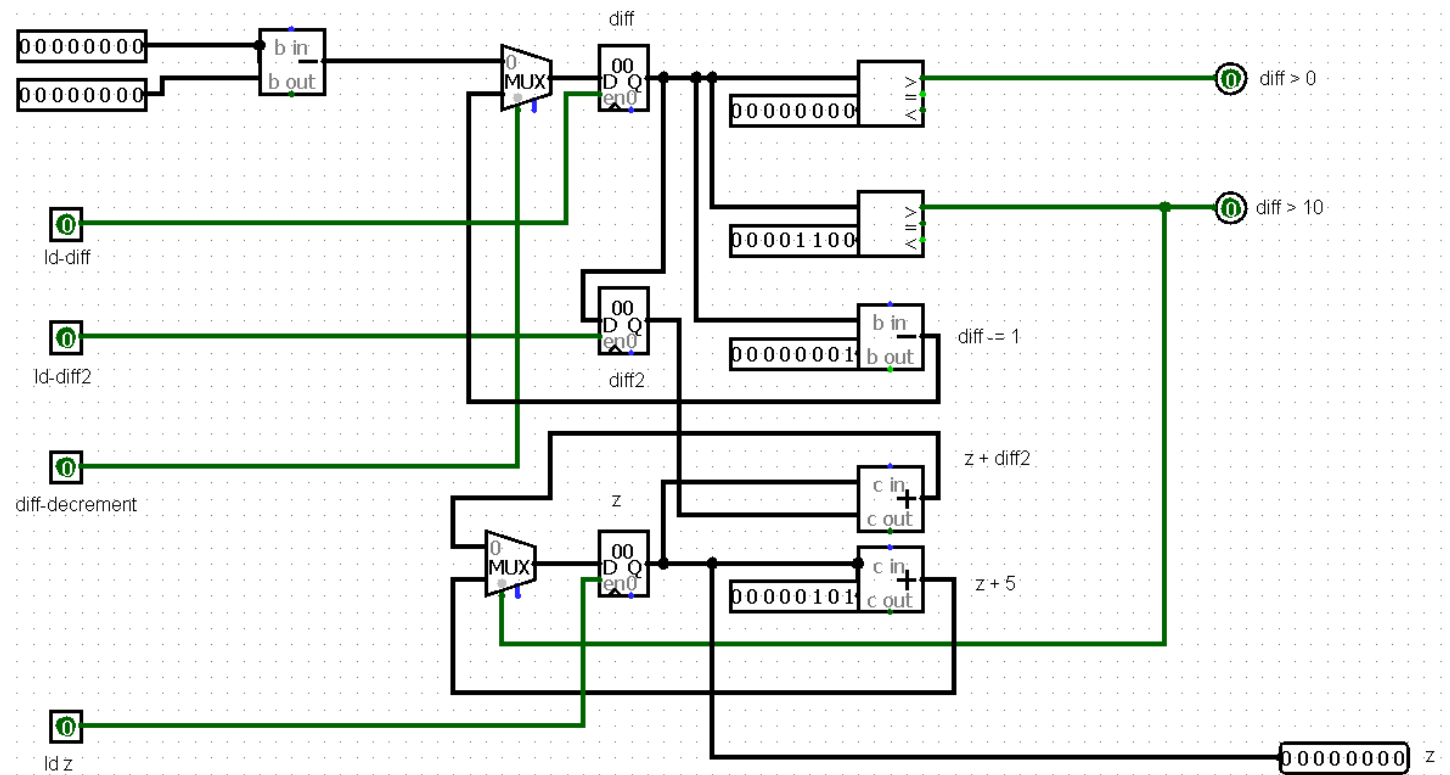
z = z + diff2

s4

s5

z = z+5

s6

diff = diff-1

end

Datapath:

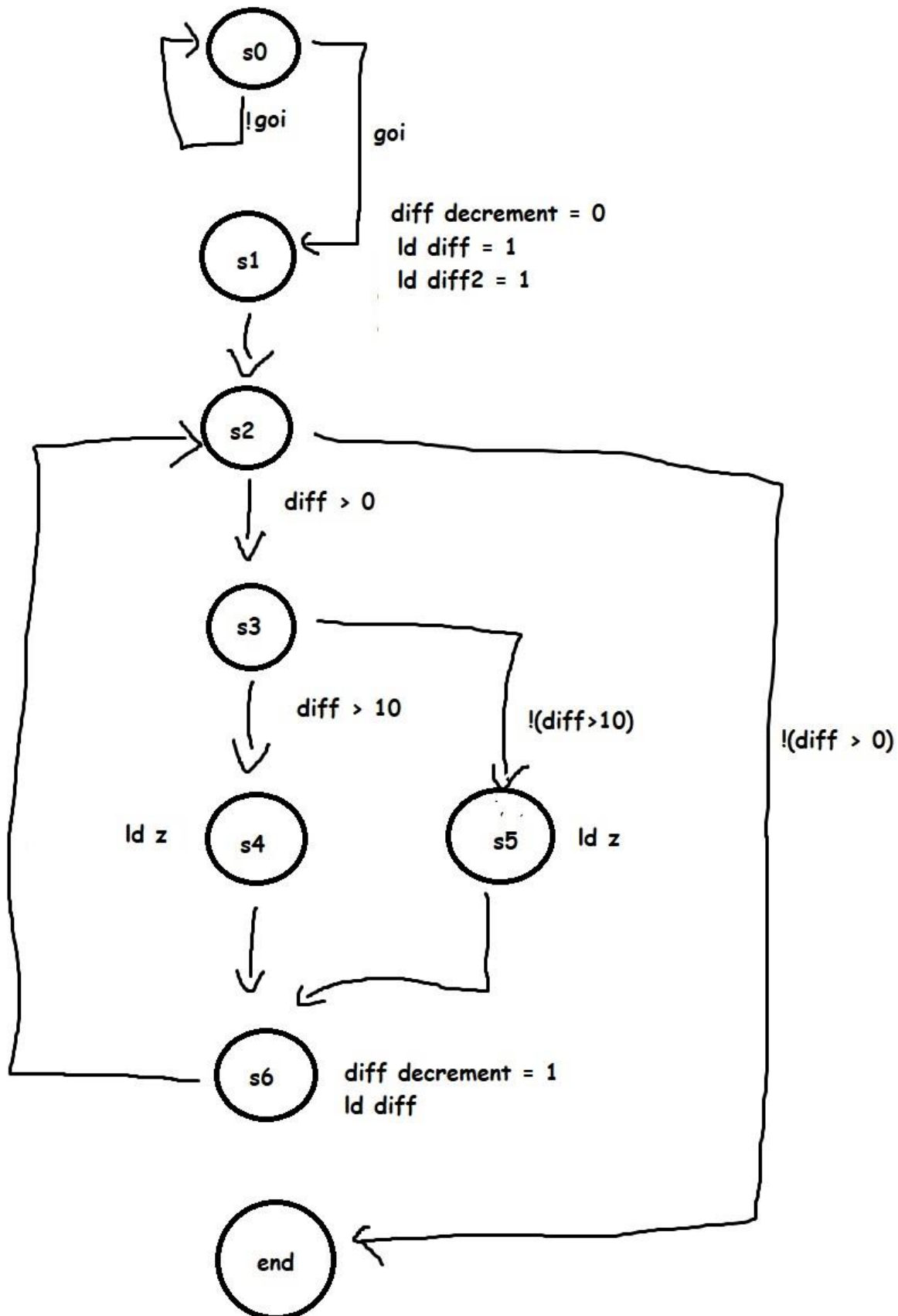Data: xi, yi

Operations: Store, Add, Substract, Compare

Control Inputs: Ld-diff: Load diff register

Ld-diff2: Load diff2 register

Diff-decrement: Decrement diff (If 0, diff = x – y result will be loaded,

if 1, diff = diff – 1 result will be loaded)

Finite State Machine

Controller:

State	Definition	R0	R1	R2
S0	Wait	0	0	0
S1	Initialize x,y,z,diff,diff2	0	0	1
S2	While loop check	0	1	0
S3	If loop check	0	1	1
S4	If(diff > 10) state	1	0	0
S5	Else state	1	0	1
S6	Decrement diff	1	1	0
end	Loop ended	1	1	1