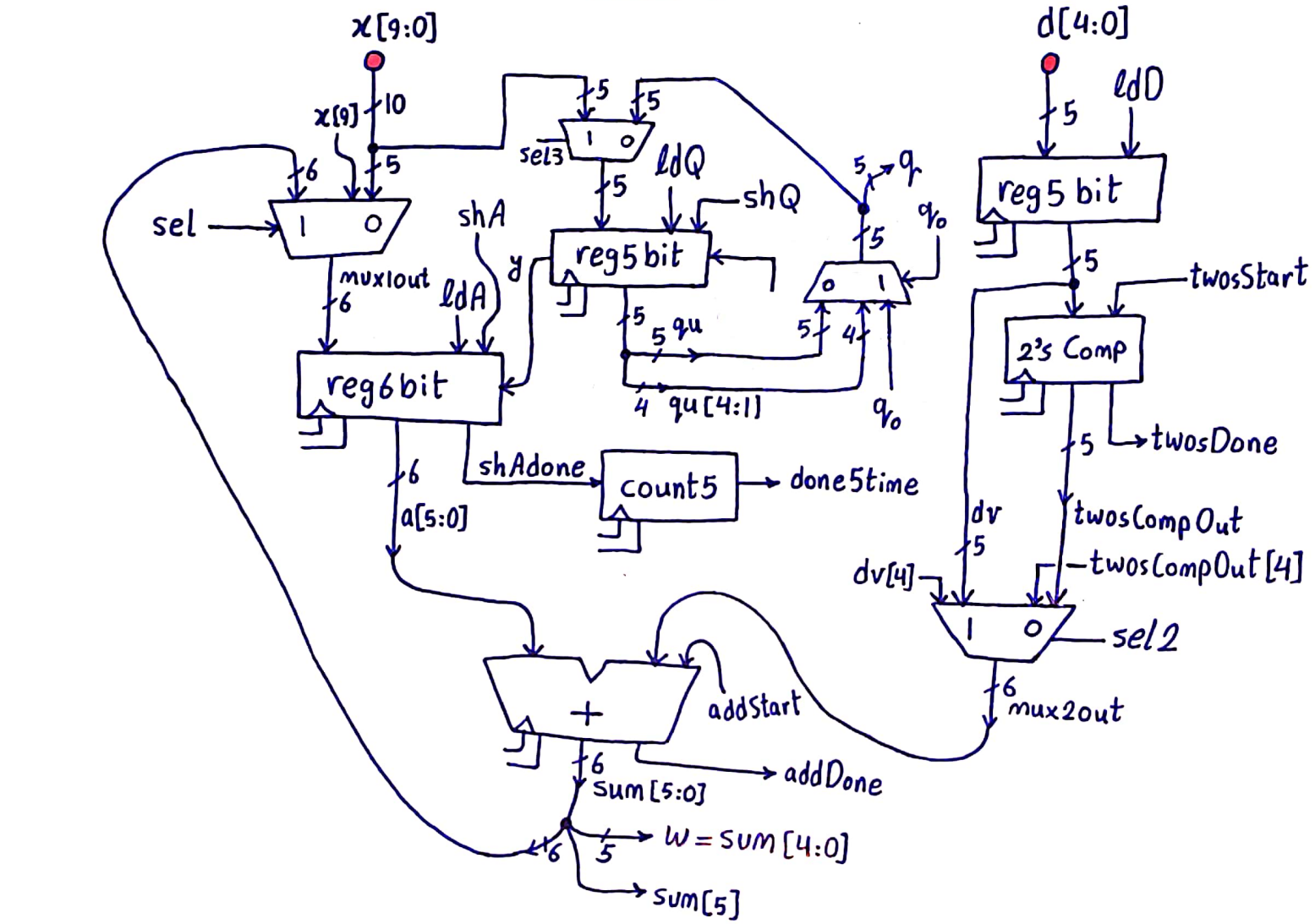
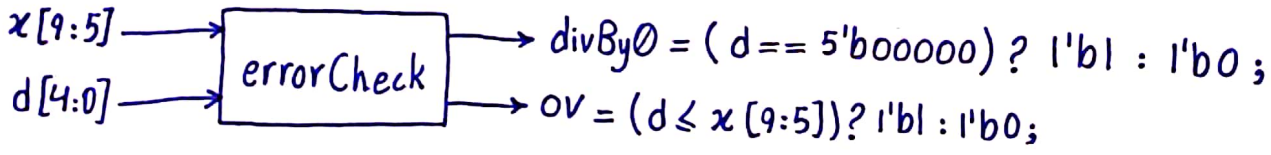
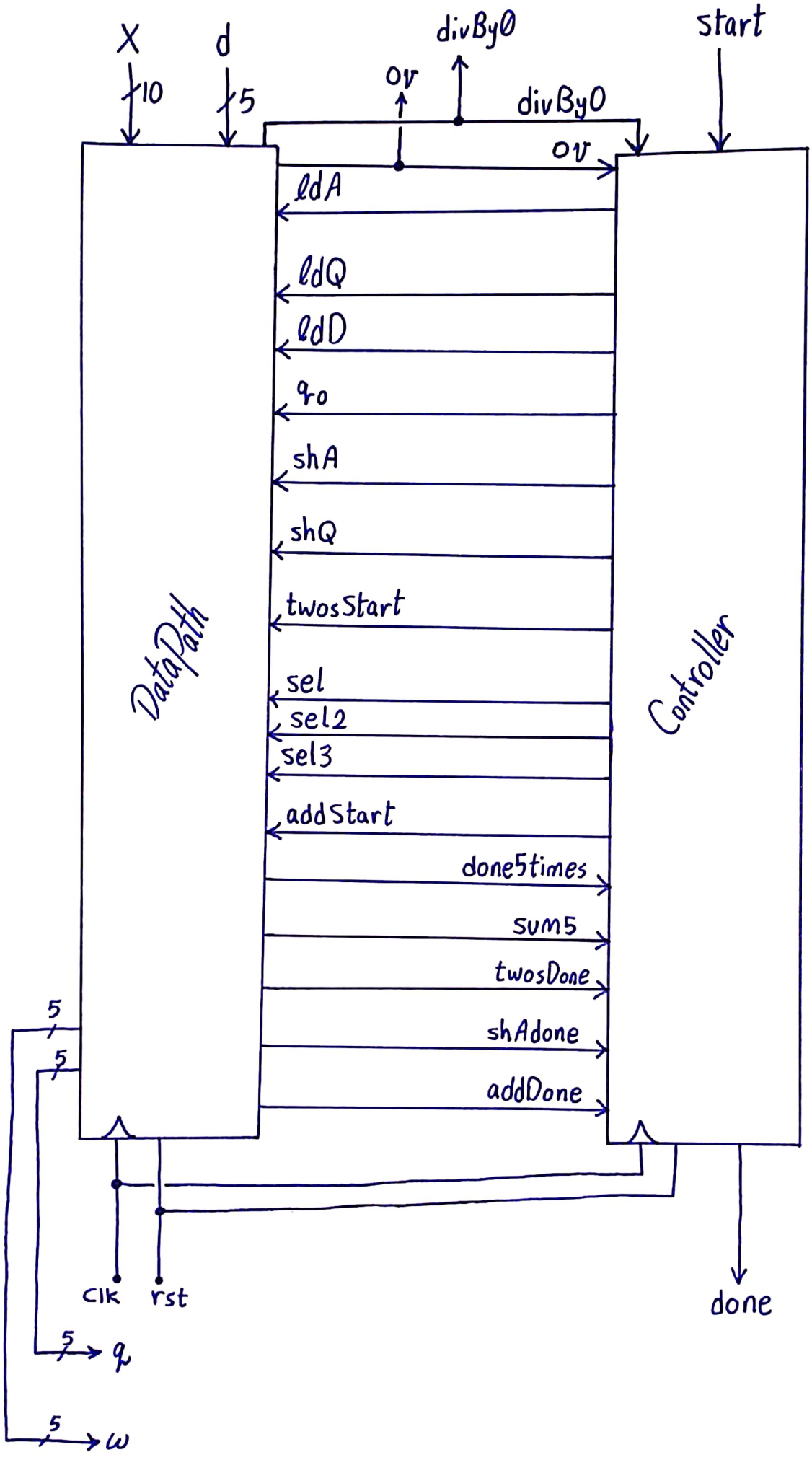
DataPath

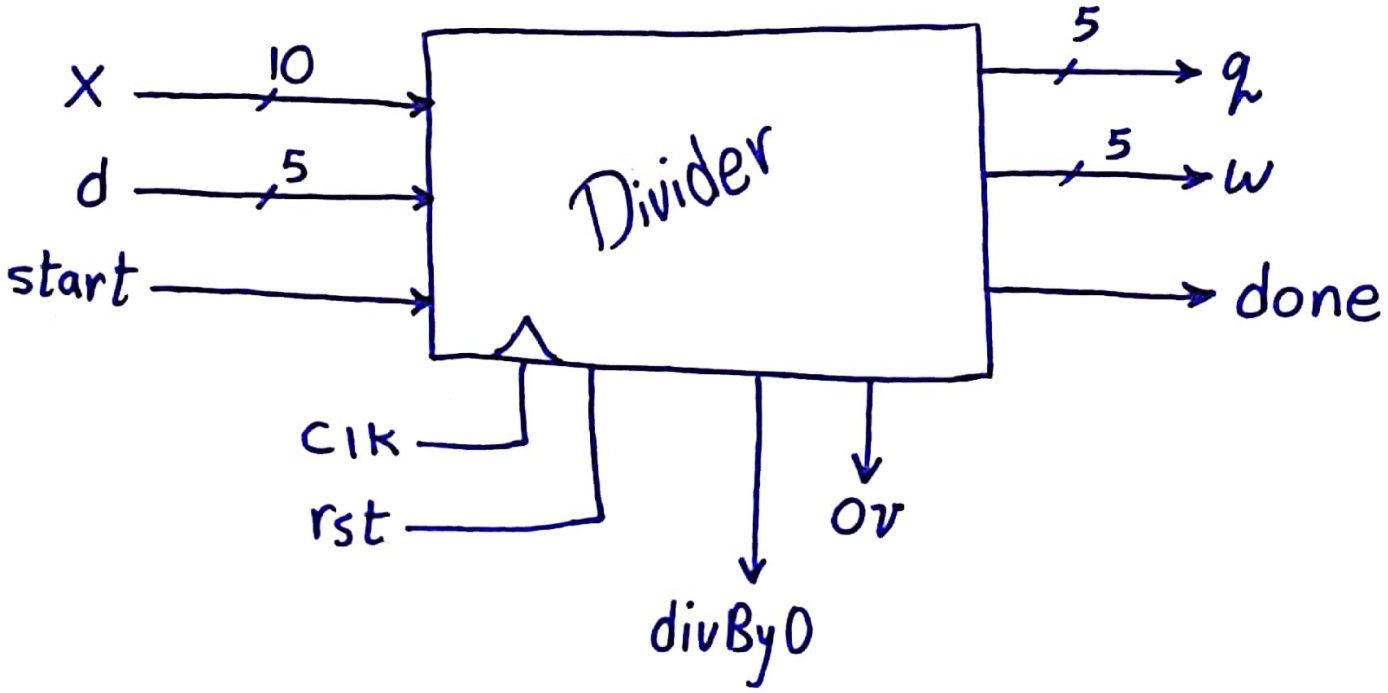


x[9:0]
x[9]
10
5
6
sel
1 0
mux1out
6
ldA
shA
y
reg6bit
6
a[5:0]
shAdone
count5
done5time
sel3
1 0
5
5
5
ldQ
shQ
reg5bit
5
5 qu
4 qu[4:1]
5 q
5
q0
0 1
5
4
q0
d[4:0]
5
ldD
reg5 bit
5
twosStart
2's Comp
5
twosDone
twosCompOut
twosCompOut[4]
dv
5
dv[4]
1 0
sel2
6
mux2out
+
addStart
addDone
6
sum[5:0]
6
5
w = sum[4:0]
sum[5]

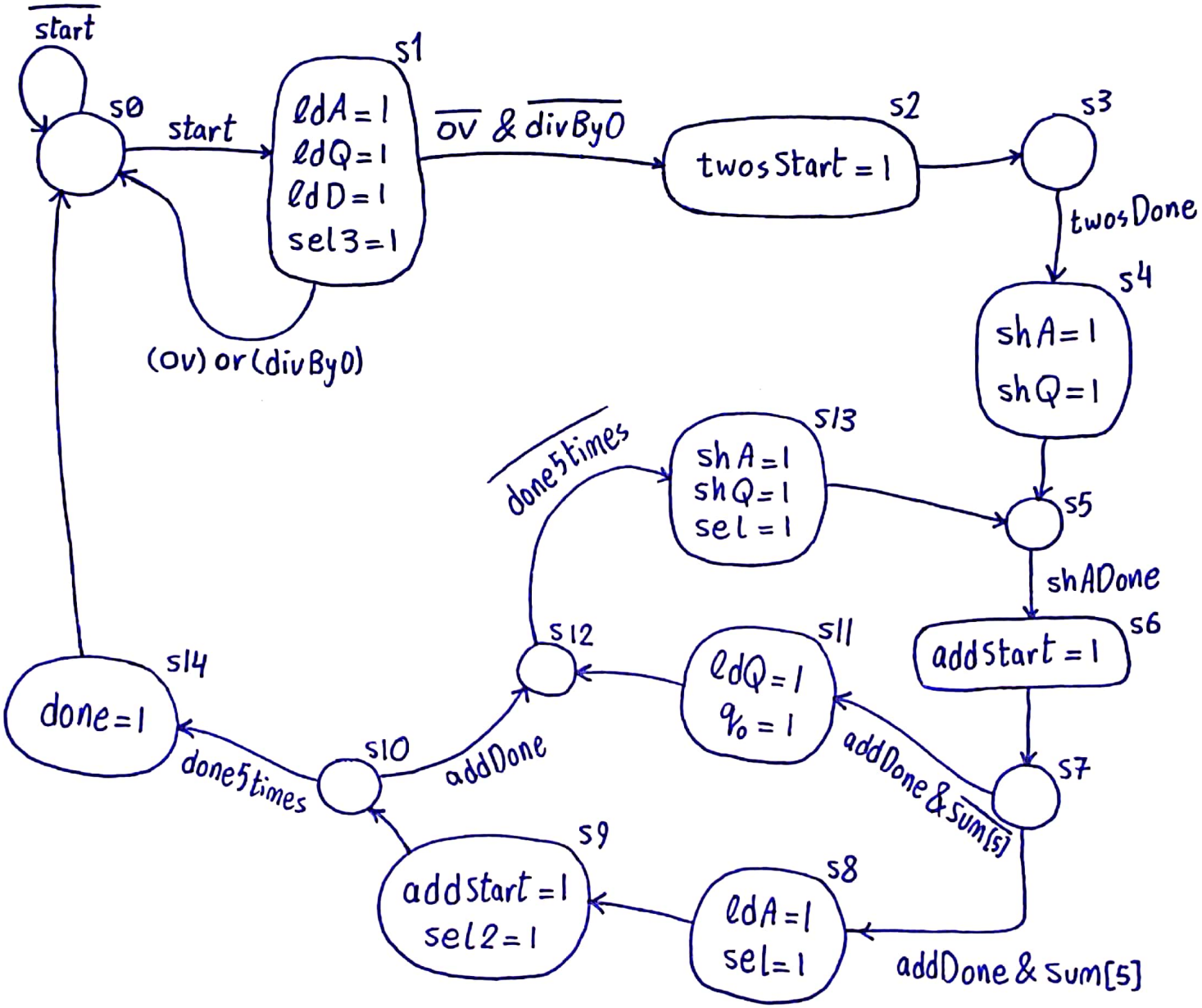


x[9:5]
d[4:0]
errorCheck
divBy0 = (d == 5'b00000) ? 1'b1 : 1'b0;
ov = (d ≤ x[9:5]) ? 1'b1 : 1'b0;


X
10
d
5
ov
divBy0
divBy0
ov
start
ldA
ldQ
ldD
q0
shA
shQ
twosStart
sel
sel2
sel3
addStart
done5times
sum5
twosDone
shAdone
addDone
DataPath
Controller
5
5
clk
rst
done
5
q
5
w


X
10
d
5
start
Divider
clk
rst
divBy0
ov
5
q
5
w
done

Controller


start
s0
start
s1
ldA = 1
ldQ = 1
ldD = 1
sel3 = 1
ov & divBy0
s2
twosStart = 1
s3
twosDone
s4
shA = 1
shQ = 1
(ov) or (divBy0)
done5times
s13
shA = 1
shQ = 1
sel = 1
s5
shADone
s6
addStart = 1
s11
ldQ = 1
q0 = 1
s12
s14
done = 1
s10
addDone
done5times
addDone & sum[5]
s7
s9
addStart = 1
sel2 = 1
s8
ldA = 1
sel = 1
addDone & sum[5]