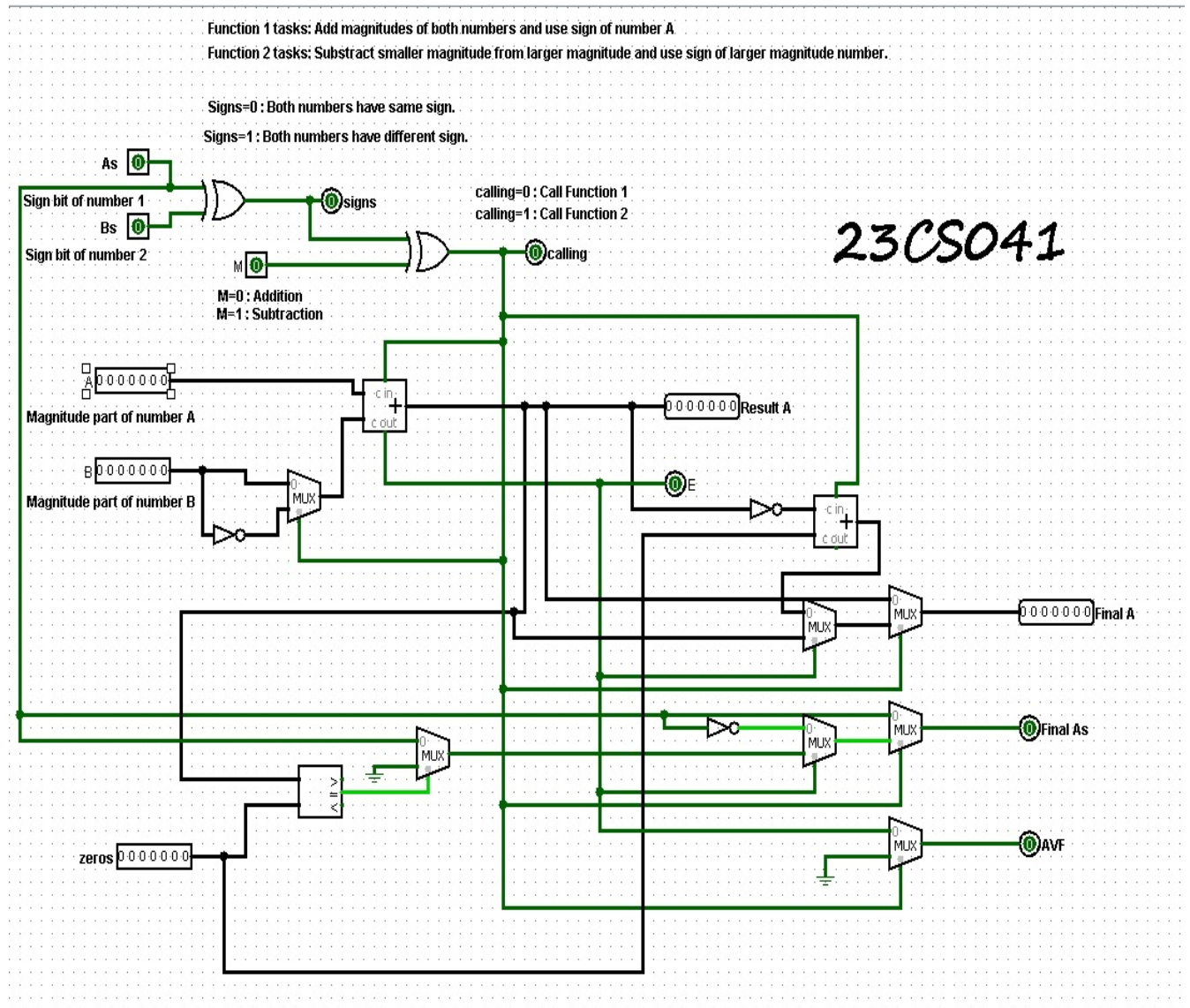# EXPERIMENT NO. 2

AIM: Implement a circuit in Logisim which perform Addition and Subtraction of sign number.

ALGORITHM:

CIRCUITS:

Function 1 tasks: Add magnitudes of both numbers and use sign of number A
Function 2 tasks: Substract smaller magnitude from larger magnitude and use sign of larger magnitude number.

Signs=0 : Both numbers have same sign.
Signs=1 : Both numbers have different sign.

As

Sign bit of number 1

Bs

Sign bit of number 2

calling=0 : Call Function 1
calling=1 : Call Function 2

signs

M

calling

23CS041

M=0 : Addition
M=1 : Subtraction

A 0 0 0 0 0 0 0

Magnitude part of number A

Result A

B 0 0 0 0 0 0 0

Magnitude part of number B

E

Final A

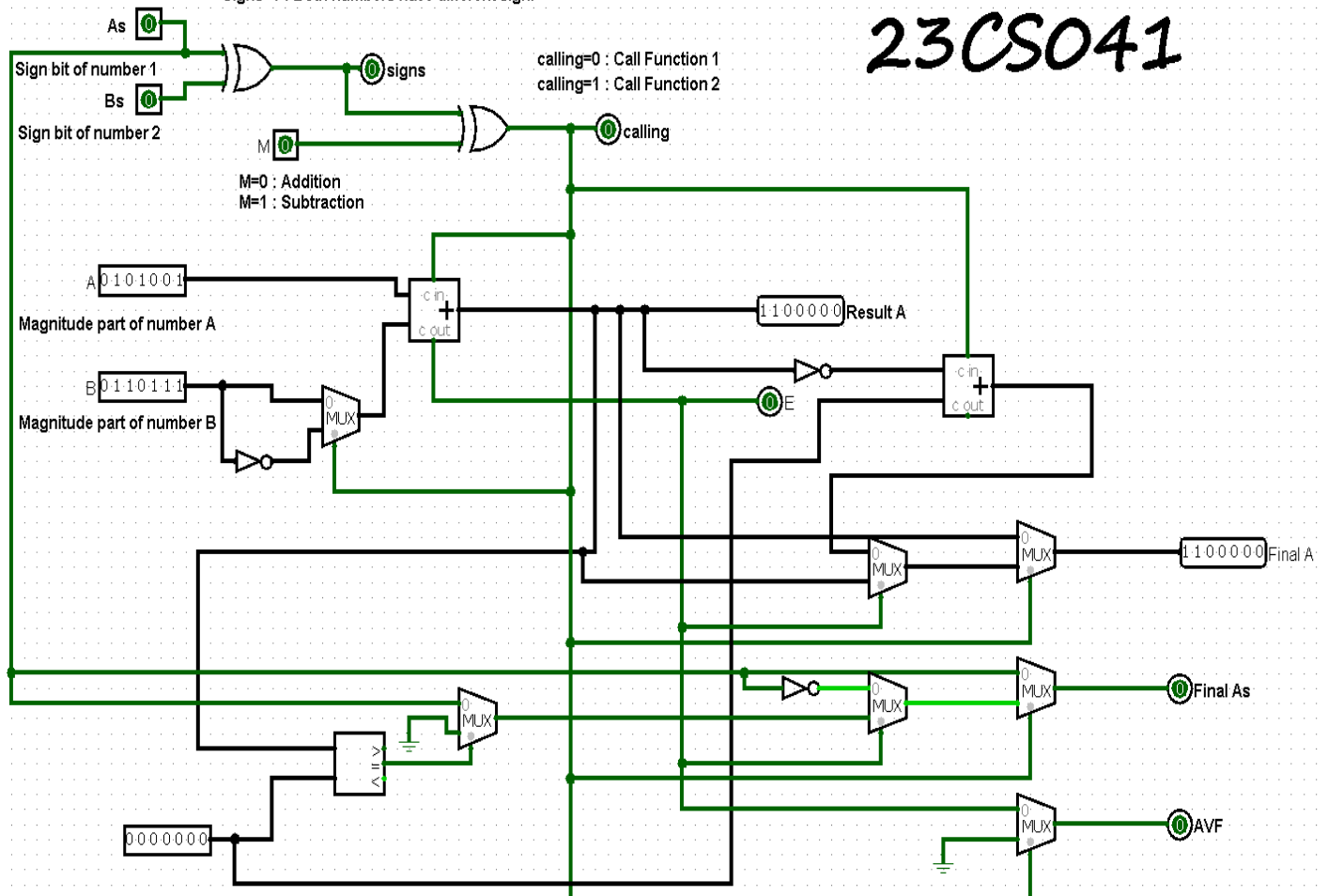Final As

zeros 0 0 0 0 0 0 0

AVF

OUTPUTS:

　　　　1.

Function 1 tasks: Add magnitudes of both numbers and use sign of number A
Function 2 tasks: Substract smaller magnitude from larger magnitude and use sign of larger magnitude number.

Signs=0 : Both numbers have same sign.
Signs=1 : Both numbers have different sign.

calling=0 : Call Function 1
calling=1 : Call Function 2

23CS041

M=0 : Addition
M=1 : Subtraction

2.

Function 1 tasks: Add magnitudes of both numbers and use sign of number A

Function 2 tasks: Substract smaller magnitude from larger magnitude and use sign of larger magnitude number.

Signs=0 : Both numbers have same sign.
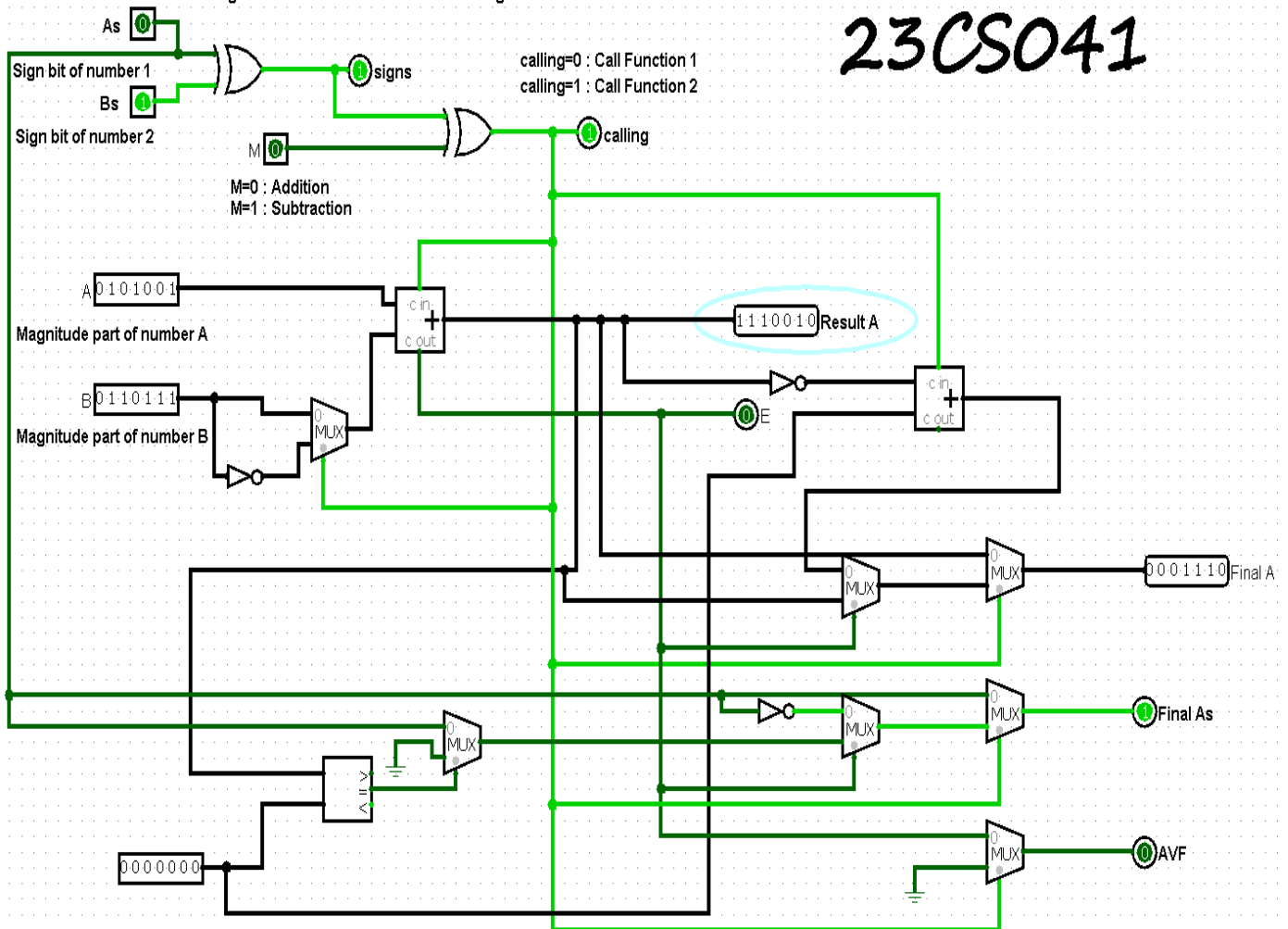
Signs=1 : Both numbers have different sign.

23CS041

As **0**

Sign bit of number 1

1 signs

calling=0 : Call Function 1

calling=1 : Call Function 2

Bs **1**

Sign bit of number 2

M **0**

1 calling

M=0 : Addition

M=1 : Subtraction

A 0 1 0 1 0 0 1

Magnitude part of number A

c in

c out

+

1 1 1 0 0 1 0 Result A

B 0 1 1 0 1 1 1

Magnitude part of number B

MUX

0 E

c in

c out

+

MUX

MUX

0 0 0 1 1 1 0 Final A

MUX

MUX

MUX

1 Final As

ALU

0 0 0 0 0 0 0

MUX

0 AVF

3.

Function 1 tasks: Add magnitudes of both numbers and use sign of number A

Function 2 tasks: Substract smaller magnitude from larger magnitude and use sign of larger magnitude number.

Signs=0 : Both numbers have same sign.

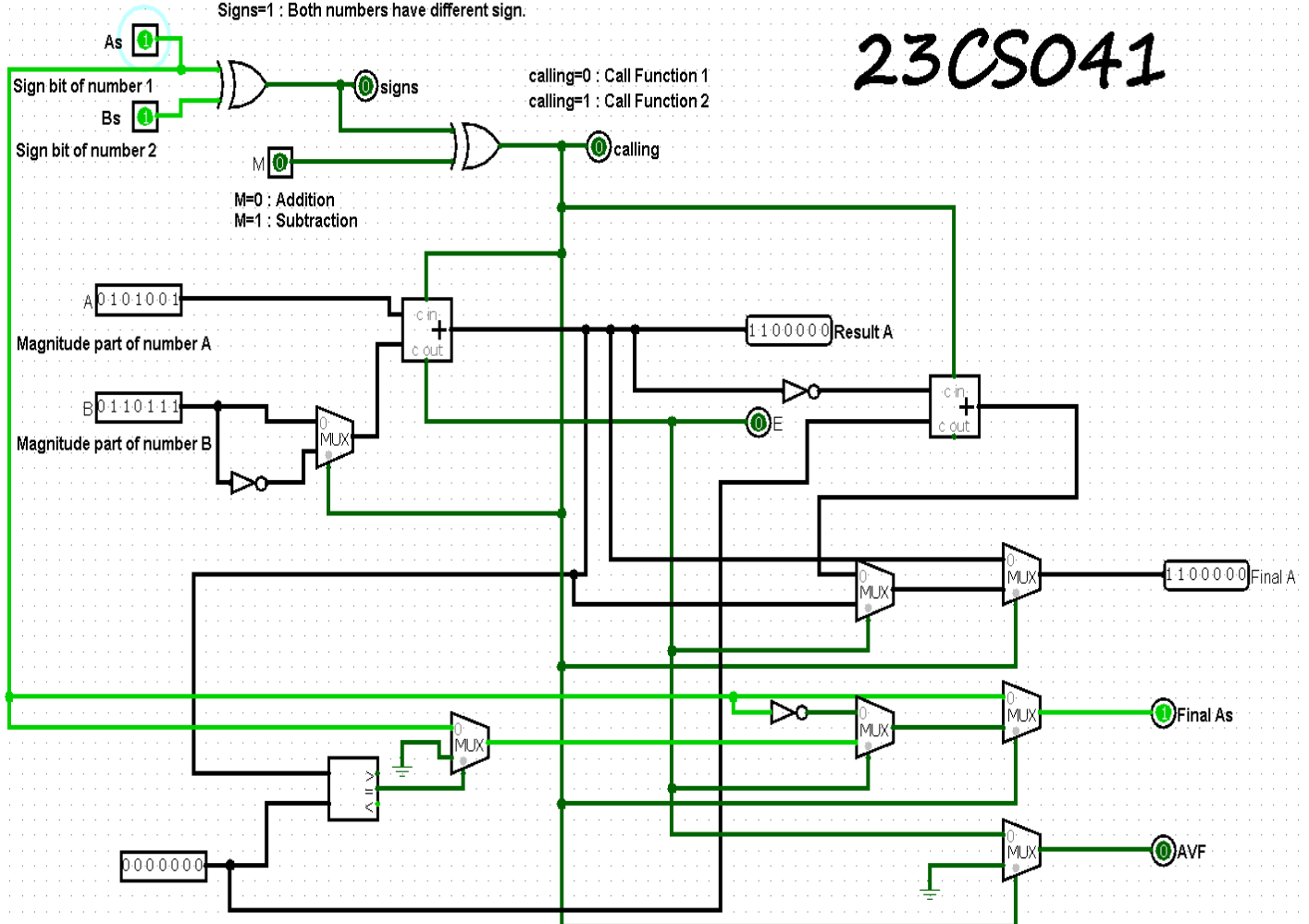Signs=1 : Both numbers have different sign.

calling=0 : Call Function 1
calling=1 : Call Function 2

23CS041

M=0 : Addition
M=1 : Subtraction

As [1]

Sign bit of number 1

Bs [1]

Sign bit of number 2

M [0]

signs [0]

calling [0]

A 0 1 0 1 0 0 1

Magnitude part of number A

B 0 1 1 0 1 1 1

Magnitude part of number B

1 1 0 0 0 0 0 Result A

E [0]

1 1 0 0 0 0 0 Final A

Final As [1]

AVF [0]

0 0 0 0 0 0 0

4.

Function 1 tasks: Add magnitudes of both numbers and use sign of number A

Function 2 tasks: Substract smaller magnitude from larger magnitude and use sign of larger magnitude number.

Signs=0 : Both numbers have same sign.

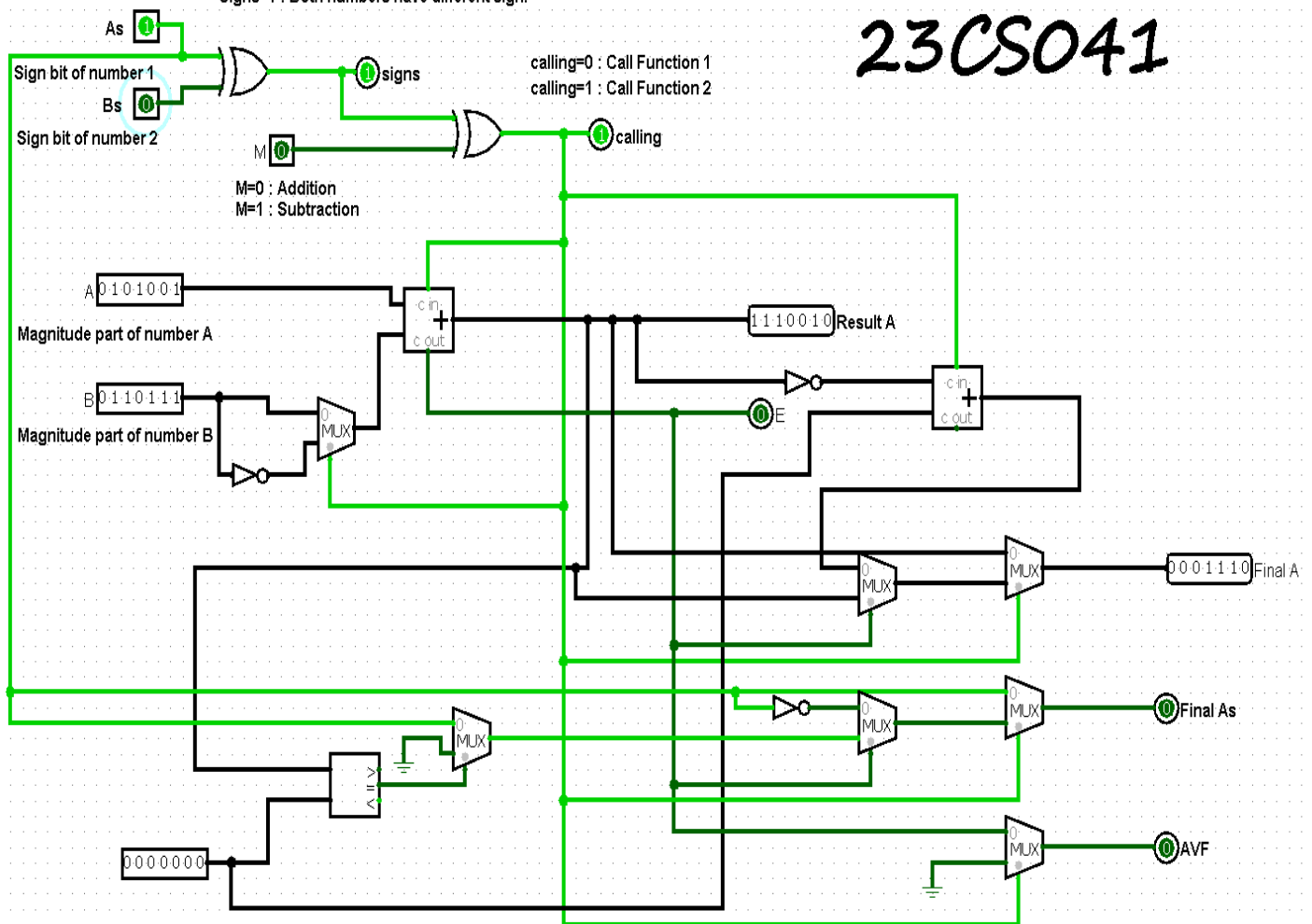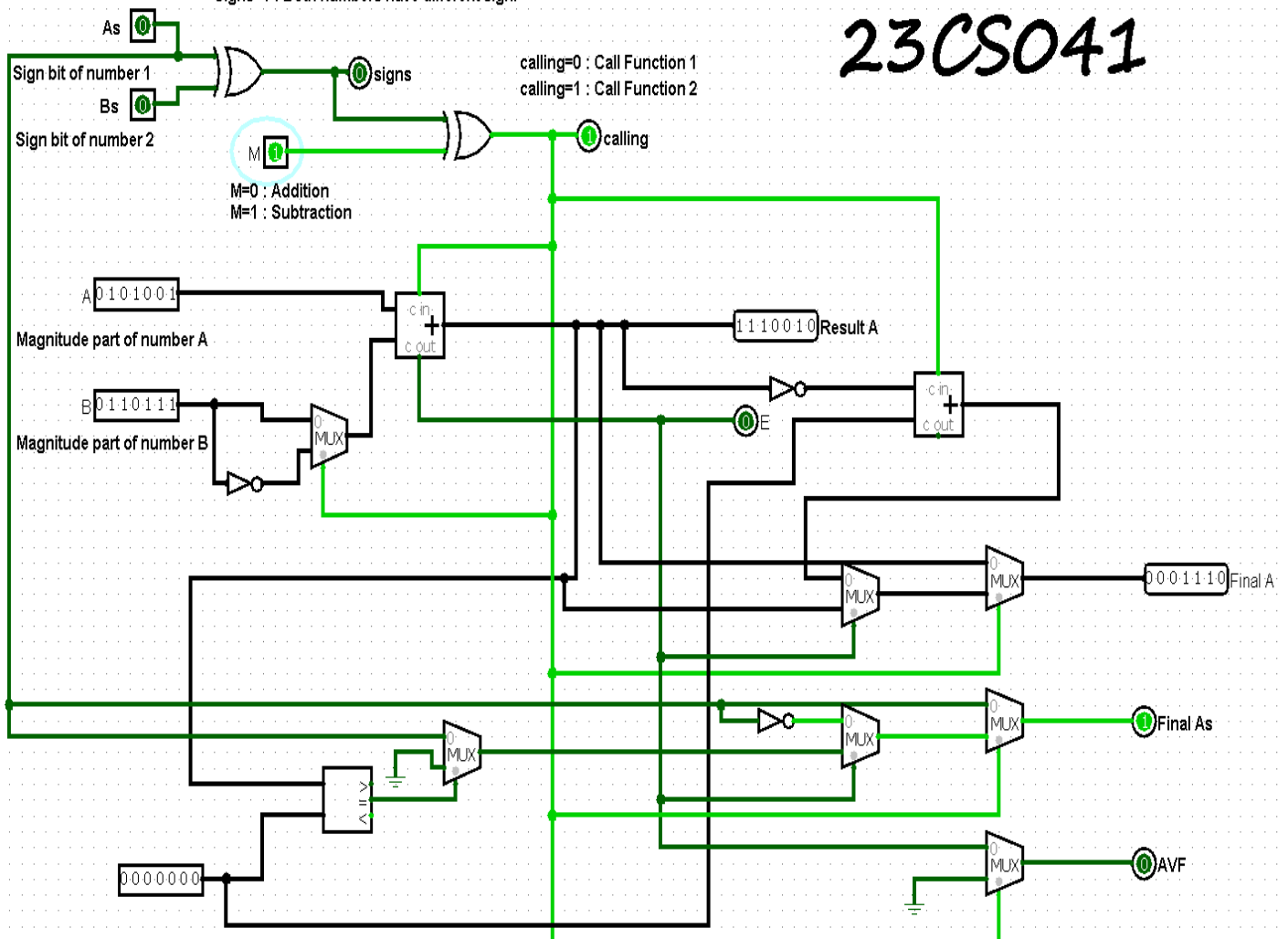Signs=1 : Both numbers have different sign.

As

Sign bit of number 1

Bs

Sign bit of number 2

signs

M

calling=0 : Call Function 1

calling=1 : Call Function 2

calling

M=0 : Addition

M=1 : Subtraction

23CS041

A 0 1 0 1 0 0 1

Magnitude part of number A

c in
c out

1 1 1 0 0 1 0   Result A

B 0 1 1 0 1 1 1

Magnitude part of number B

MUX

E

c in
c out

MUX

MUX

0 0 0 1 1 1 0 Final A

MUX

MUX

Final As

0 0 0 0 0 0 0

MUX

AVF

5.

Function 1 tasks: Add magnitudes of both numbers and use sign of number A

Function 2 tasks: Substract smaller magnitude from larger magnitude and use sign of larger magnitude number.

Signs=0 : Both numbers have same sign.
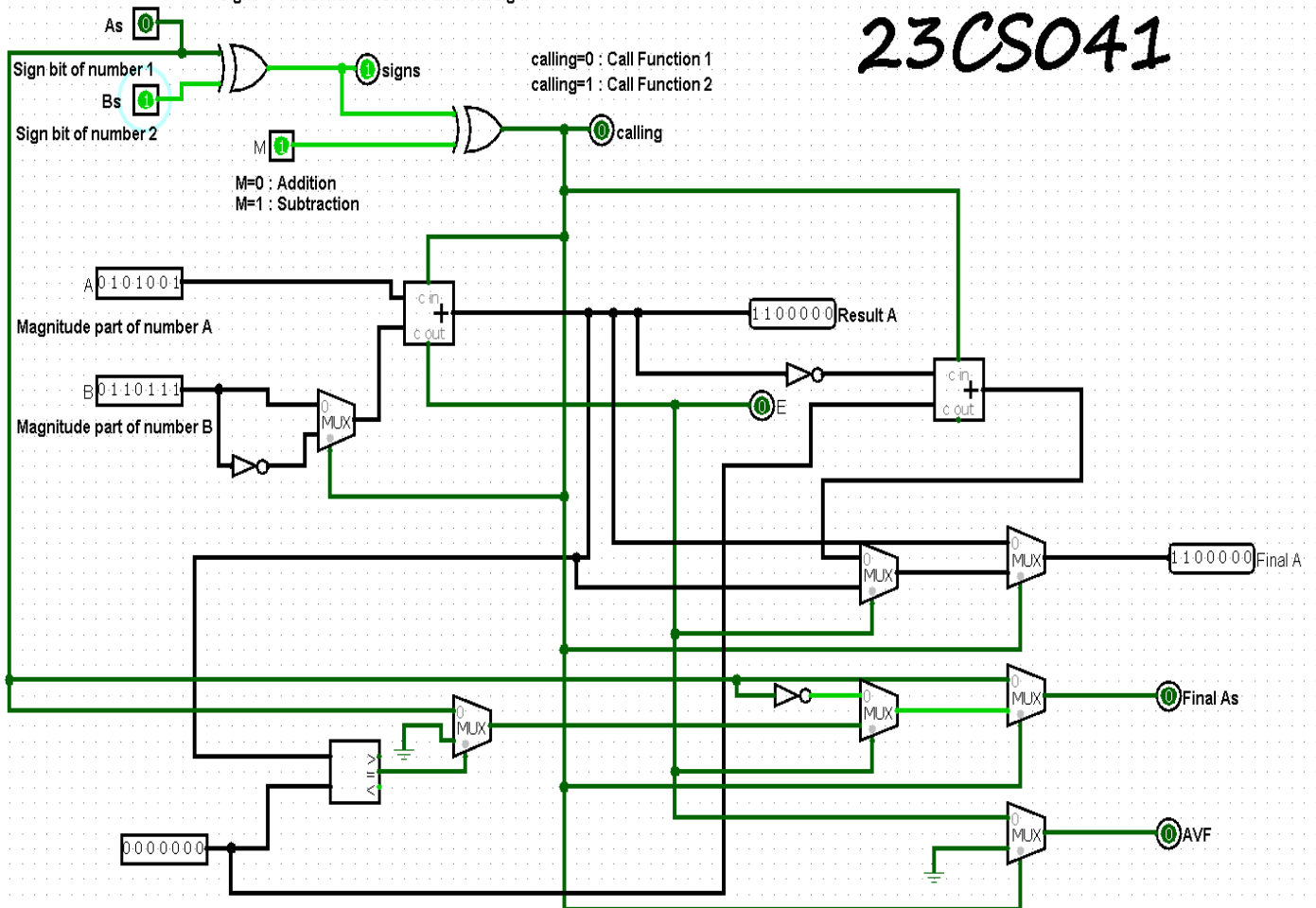
Signs=1 : Both numbers have different sign.

calling=0 : Call Function 1

calling=1 : Call Function 2

23CS041

As [0]

Sign bit of number 1

Bs [0]

Sign bit of number 2

signs

M [1]

M=0 : Addition

M=1 : Subtraction

calling

A [0 1 0 1 0 0 1]

Magnitude part of number A

B [0 1 1 0 1 1 1]

Magnitude part of number B

c in
c out

[1 1 1 0 0 1 0] Result A

MUX

E

c in
c out

MUX

MUX

[0 0 0 1 1 1 0] Final A

MUX

MUX

MUX

[1] Final As

[0 0 0 0 0 0 0]

MUX

AVF

6.

Function 1 tasks: Add magnitudes of both numbers and use sign of number A

Function 2 tasks: Substract smaller magnitude from larger magnitude and use sign of larger magnitude number.

Signs=0 : Both numbers have same sign.
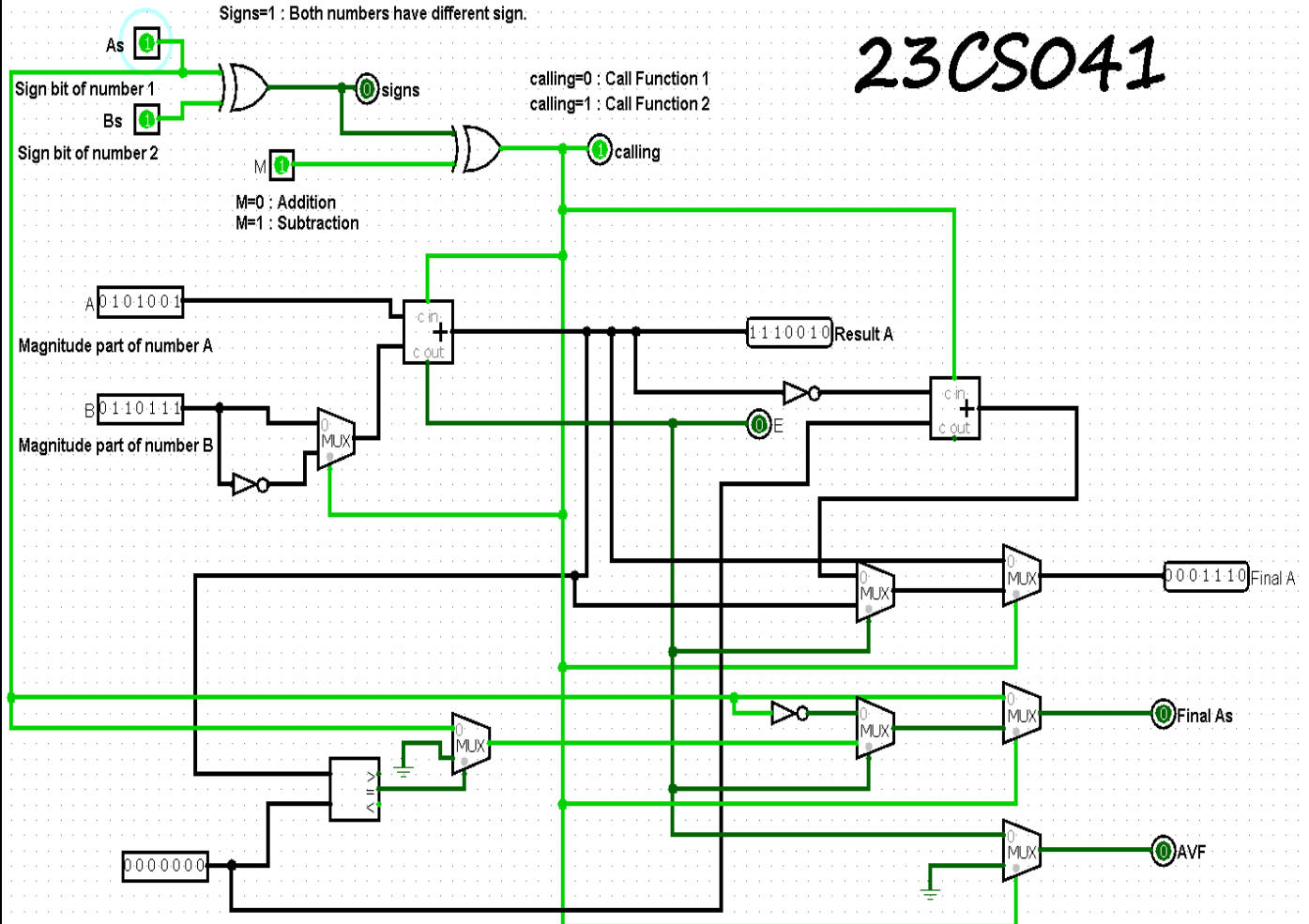
Signs=1 : Both numbers have different sign.

23CS041

As [0]

Sign bit of number 1

Bs [1]

Sign bit of number 2

[1] signs

M [1]

M=0 : Addition
M=1 : Subtraction

calling=0 : Call Function 1
calling=1 : Call Function 2

[0] calling

A 0 1 0 1 0 0 1

Magnitude part of number A

B 0 1 1 0 1 1 1

Magnitude part of number B

c in
+
c out

1 1 0 0 0 0 0 Result A

[0] E

c in
+
c out

MUX

MUX

MUX

1 1 0 0 0 0 0 Final A

MUX

MUX

[0] Final As

MUX

0 0 0 0 0 0 0

MUX

[0] AVF

7.

Function 1 tasks: Add magnitudes of both numbers and use sign of number A
Function 2 tasks: Substract smaller magnitude from larger magnitude and use sign of larger magnitude number.

Signs=0 : Both numbers have same sign.
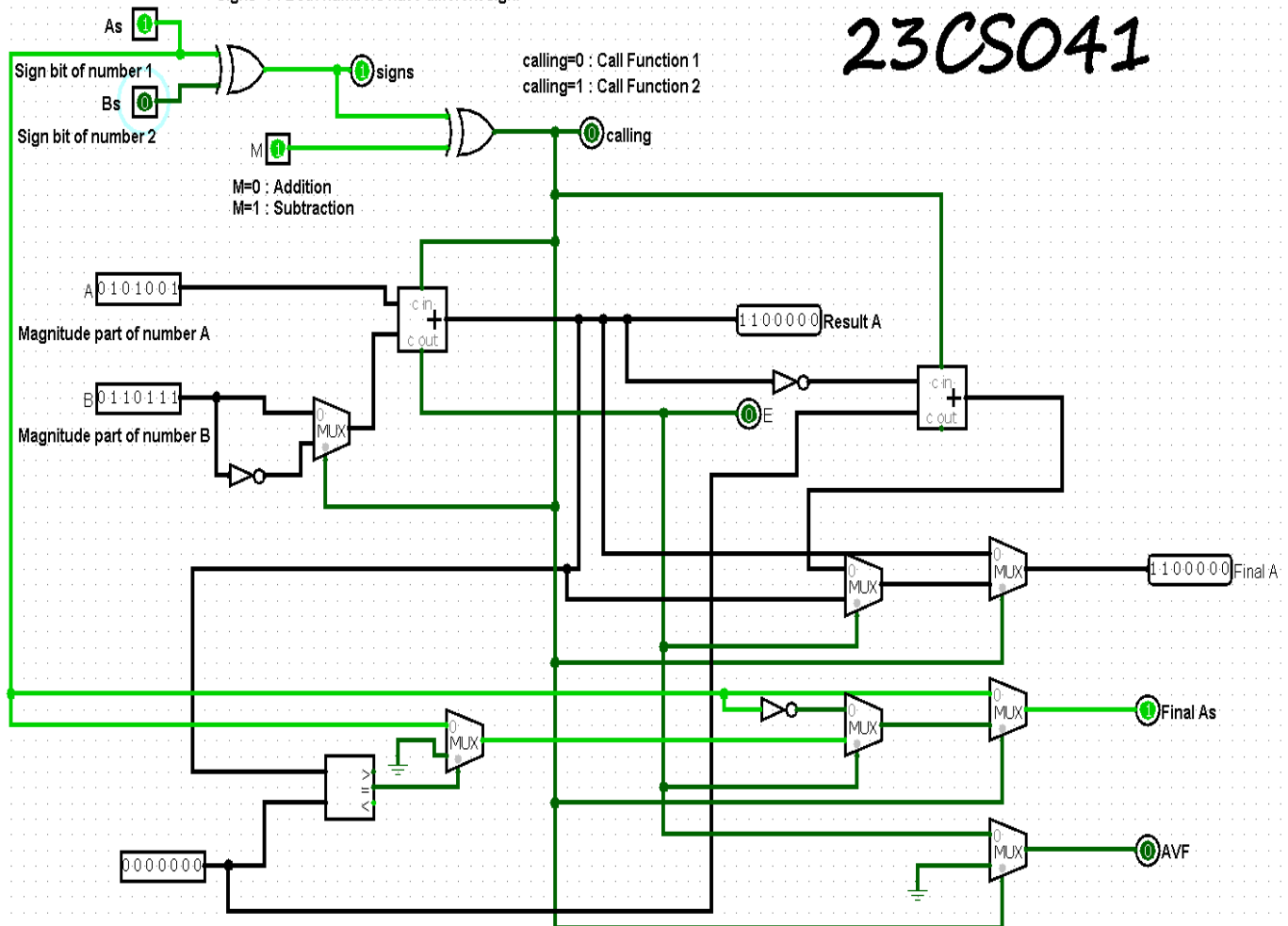Signs=1 : Both numbers have different sign.

23CS041

As

Sign bit of number 1

Bs

Sign bit of number 2

signs

M

M=0 : Addition
M=1 : Subtraction

calling=0 : Call Function 1
calling=1 : Call Function 2

calling

A 0 1 0 1 0 0 1

Magnitude part of number A

B 0 1 1 0 1 1 1

Magnitude part of number B

c in
c out

MUX

1 1 1 0 0 1 0 Result A

E

c in
c out

MUX

MUX

0 0 0 1 1 1 0 Final A

MUX

MUX

MUX

Final As

A < B

MUX

0 0 0 0 0 0 0

MUX

AVF

8.

CONCLUSION: