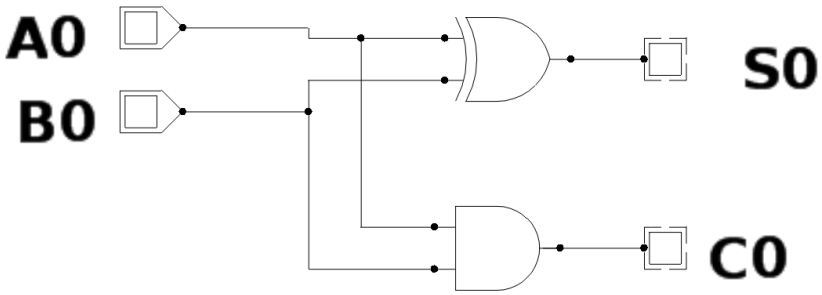
In-Class Exercises: Sept.15

- 7 questions plus an extra question at end
  - Focus on ‘solving’ the first 7 questions
  - Work on abstracting things and describing the output before working on writing the Boolean function
- Refer to CedarLogic file Set2.cdl
  - Circuit drawings are shown in this document
  - Solve the problem first and then implement in your simulator of choice
  - Questions refer to circuits in Set2
    - Set2 Page 1, Set2 Page2, etc.

Question 1: Set2- Page1

What are the truth tables for S0, C0

What function is this ?

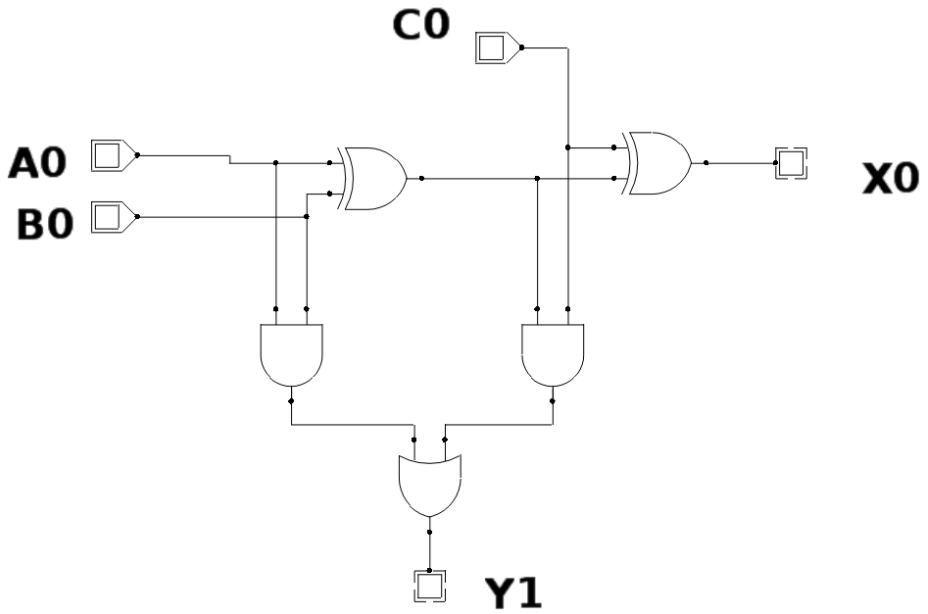


Question 2: Set 2- Page 2

Inputs: A0, B0, C0 Outputs: X0, Y1

What does this circuit do

Observe how this circuit is built using the circuit from page 1 (2 Page 1 circuits are combined)

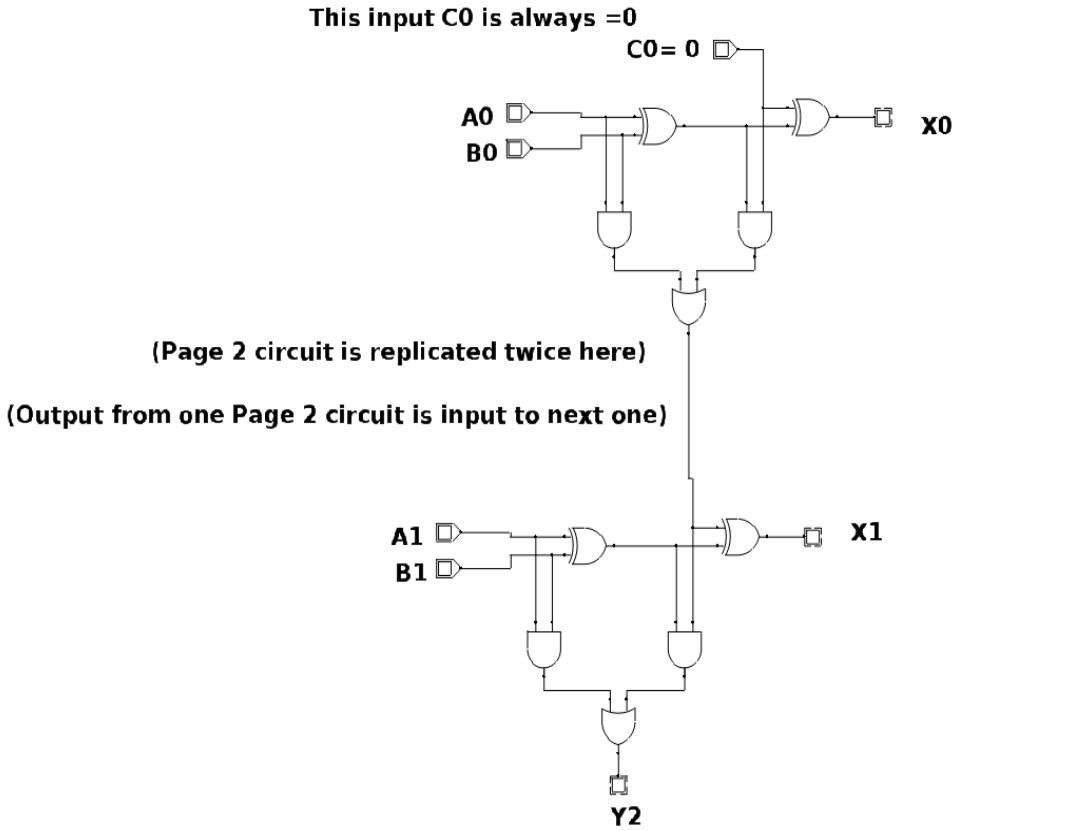


Question 3: Set 2 Page 3

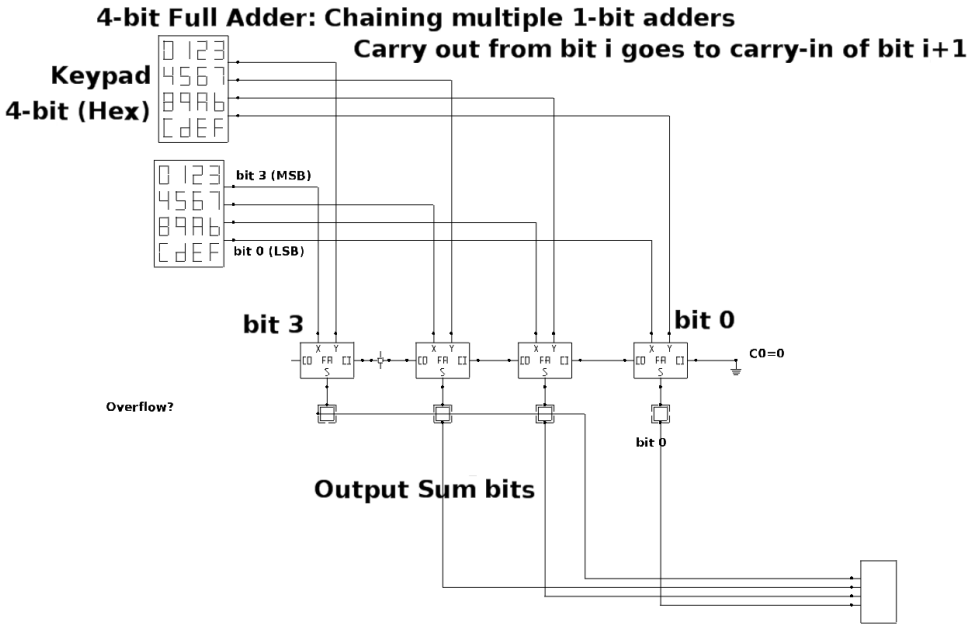
What is this circuit? **What "function" is being computed?**

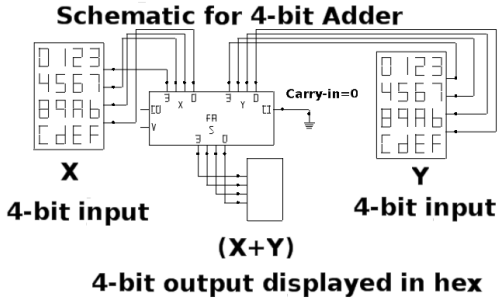
Inputs: A0,A1, B0,B1 **Outputs: X0,X1,Y2**

Observe similarity to Circuit on Page 2

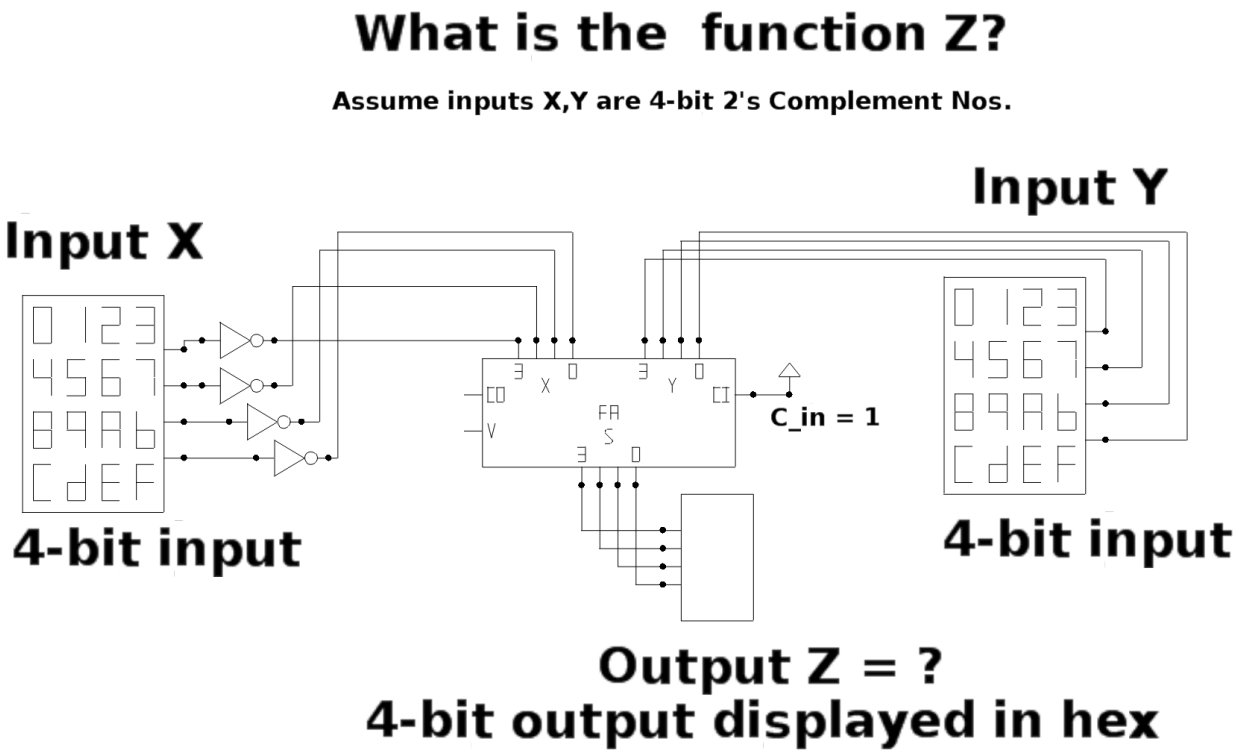


Informational Slide.
Set2 Page4: Example of building 4-bit adder using 1-bit Adder Logic Devices





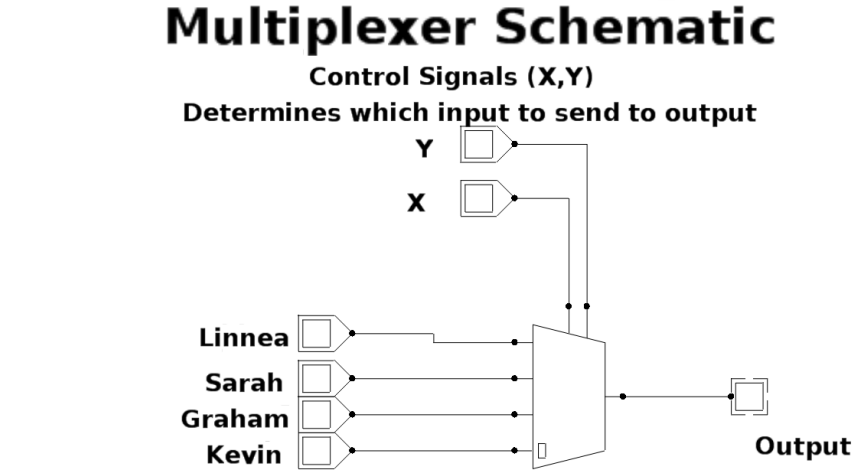
Question 4: Set 2 Page 5: Using a 4-bit Adder to implement another function.



Hex Keypad Schematic: The output is 4-bits
bit0 is at bottom, bit3 at top of output

Information Slide - Set 2 Page 6: Examples of Multiplexer and Decoder

Multiplexer Schematic

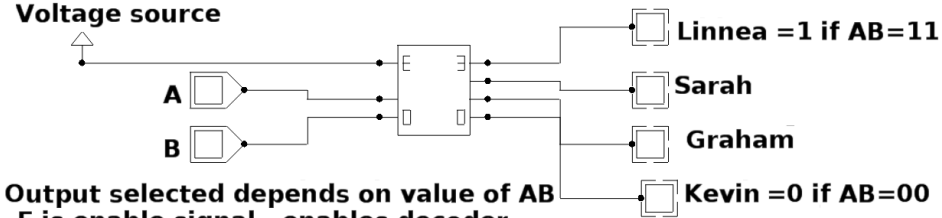


0 on MUX input lines indicates this input is select when control signal=0

If selectl lines (XY)=00 then Output= Kevin

If selectl lines (XY)=10 then Output=Sarah

Decoder Schematic



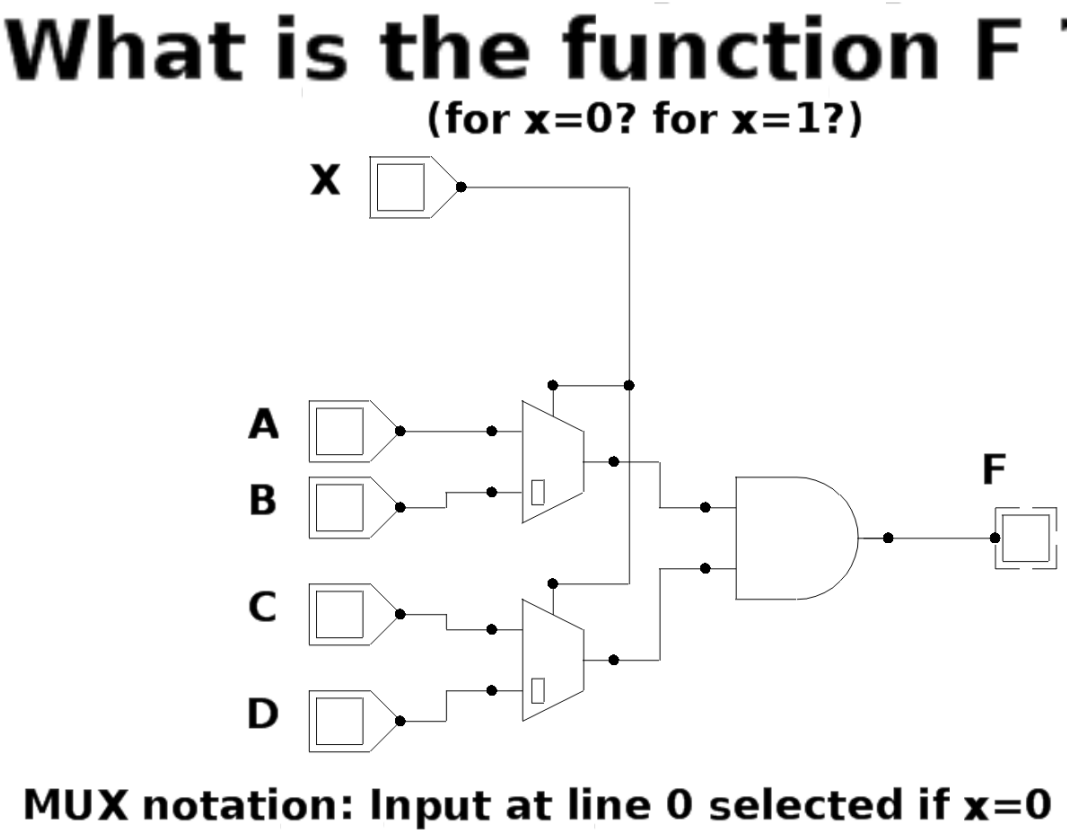
Output selected depends on value of AB

E is enable signal - enables decoder

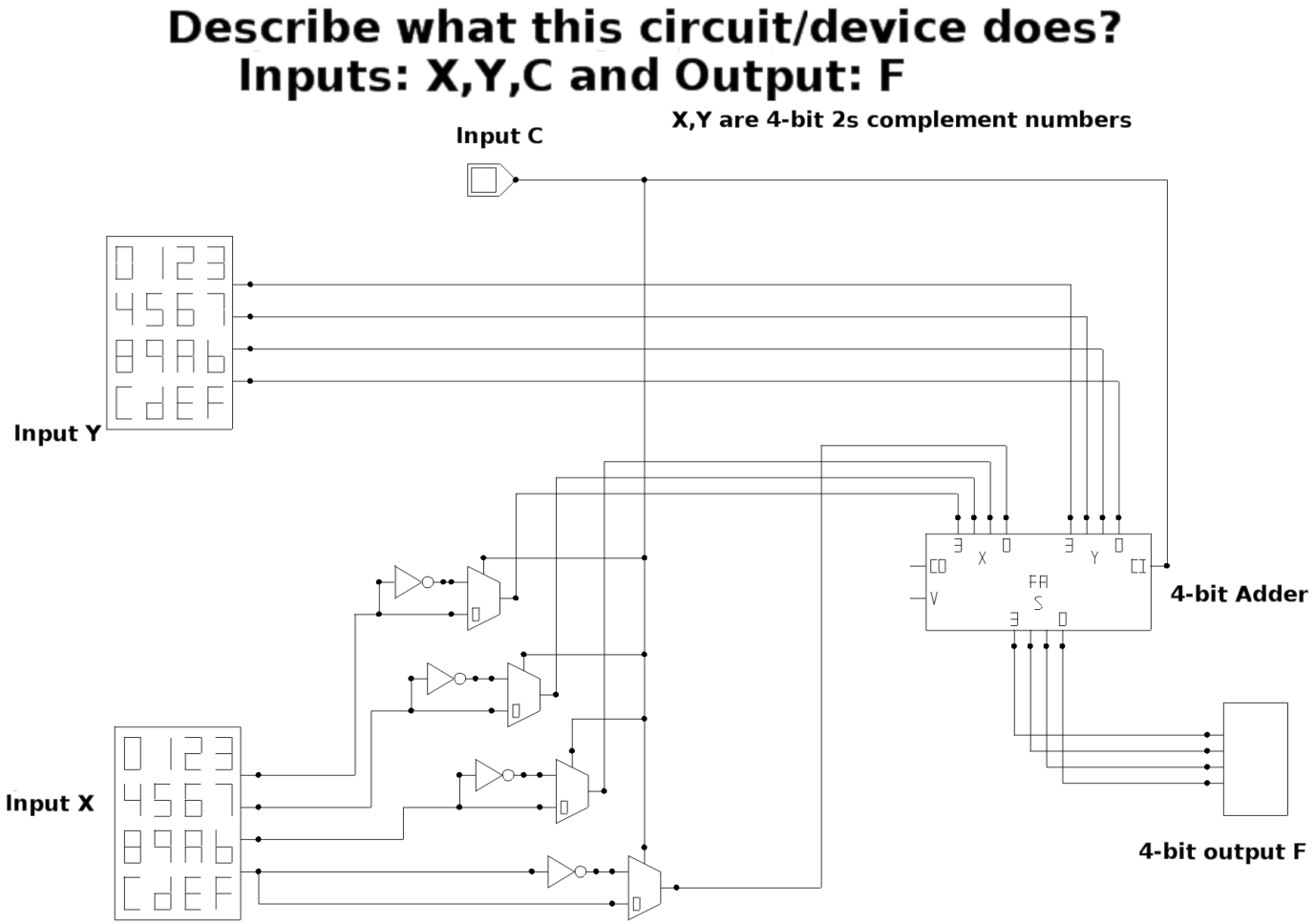
Output codes go from 0 (00) to 3 (11)

Kevin has code 0 (00), Sarah has code 2 (10)

Question 5 – Set 2 Page 7: Describe and then derive function F

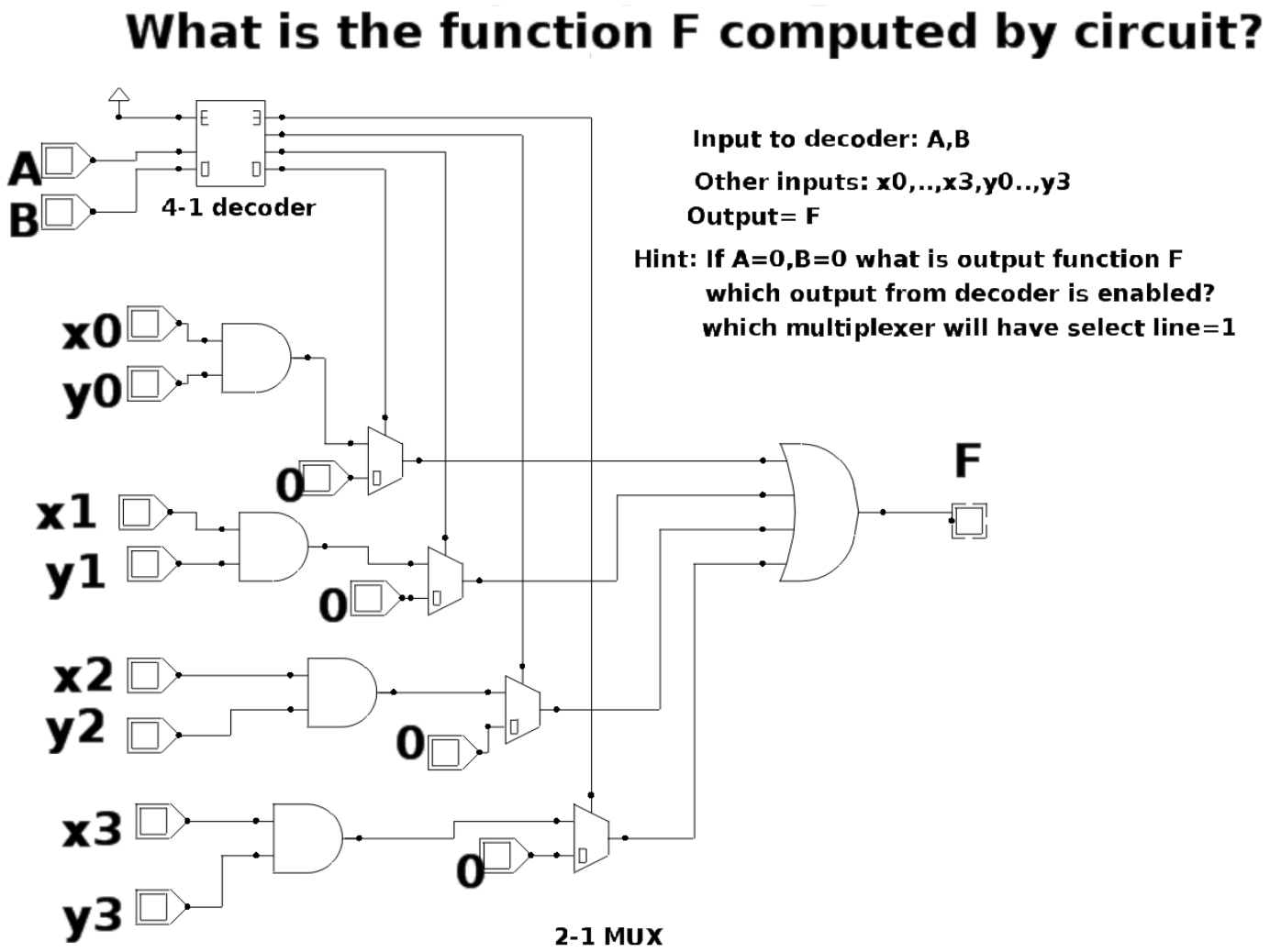


Question 6 – Set 2 Page 8: Using MUX and Adders
Describe what F computes in terms of inputs X,Y,C
X,Y are 4-bit numbers, C is a 1-bit input



Question 7 – Set 2 Page 9: Using Decoder and Multiplexer

One of the inputs to each MUX is a 0



Question 8 – Set 2 Page10
What is value of F in terms of X,Y