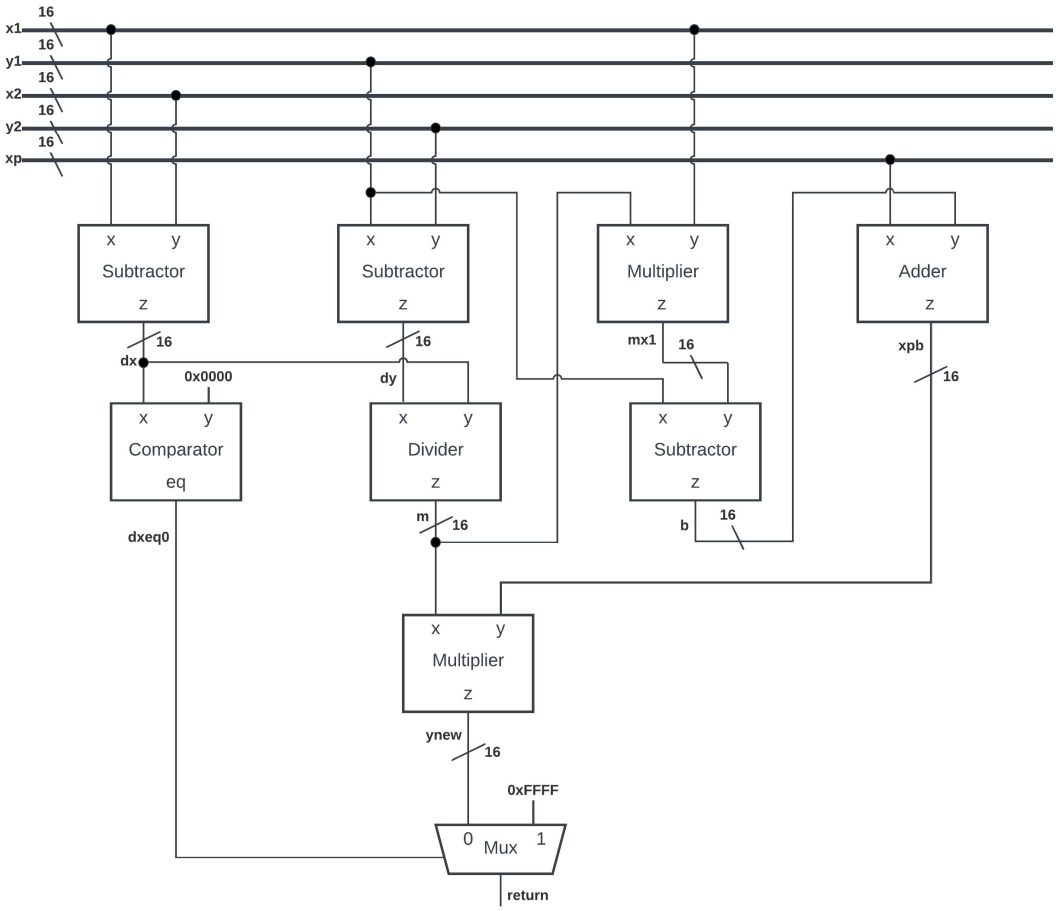
Daniel Funke
ECE 5710
Homework 1
10/18/2022

Homework 1

1) Draw a block diagram to implement the following algorithm:

```
1  int PredY(int x1, int y1, int x2, int y2, int xp)
2  {
3      int m, b, ynew;
4
5      if (x1 - x2) <> 0
6      {
7          m = (y1 - y2)/(x1 - x2);
8          b = y1 - m * x1;
9          ynew = m * xp + b;
10         return(ynew);
11     }
12     else
13     {
14         return(65535);
15     }
16 }
```



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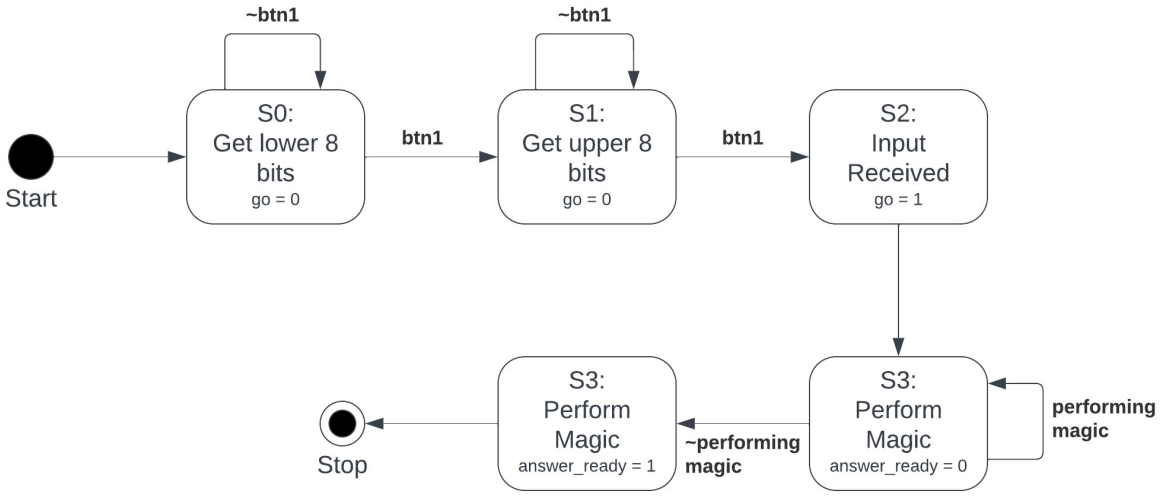
2) Design a top level for the magic function component below:

```
1  component magic is
2  port(
3      clk : in STD_LOGIC;
4      clr : in STD_LOGIC;
5      go  : in STD_LOGIC;
6      input : in STD_LOGIC_VECTOR (15 downto 0);
7      answer_ready : out STD_LOGIC;
8      answer : out STD_LOGIC_VECTOR (15 downto 0);
9  );
10 end component;
```

State Machine:



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Top Level Block Diagram: