**Homework 1**

1. Draw a block diagram to implement the following algorithm:
2. int PredY(int x1, int y1, int x2, int y2, int xp)
3. {
4. int m, b, ynew;
6. if (x1 – x2) <> 0
7. {
8. m = (y1 – y2)/(x1 – x2);
9. b = y1 – m \* x1;
10. ynew = m \* xp + b;
11. return(ynew);
12. }
13. else
14. {
15. return(65535);
16. }
17. }

Diagram, schematic

Description automatically generated

1. Design a top level for the magic function component below:
2. component magic is
3. port(
4. clk : in STD\_LOGIC;
5. clr : in STD\_LOGIC;
6. go : in STD\_LOGIC;
7. input : in STD\_LOGIC\_VECTOR (15 downto 0);
8. answer\_ready : out STD\_LOGIC;
9. answer : out STD\_LOGIC\_VECTOR (15 downto 0);
10. );
11. end component;

State Machine:Diagram

Description automatically generated

Top Level Block Diagram:

Diagram, schematic

Description automatically generated