SE 4367 (Software Testing)
Homework #13, Data Flow Graph

For the following program P written in pseudo-code,

1) Draw the data flow graph for P.
2) Build the dcu/dpu table for P. See Mathur's Example 7.31 (slide 34 in the lecture on data flow) as an illustration.

Program P

```
1)   integer X, Y, Z;
2)   input (X, Y);
3)   if (X<0 or X>8 or Y<1 or Y>3)
4)   {
5)        output ("Boundary condition failure.");
6)   } // end if invalid inputs
7)   else
8)   {
9)        Z = 0;
10)       if (X < 5)
11)       {
12)            Z = X + Y;
13)            if (Y == 1)
14)           {
15)                Z = X ^ 2;
16)           } // end if (Y==1)
17)       } // end if (X<5)
18)      else
19)      {
20)           Z = Z - X;
21)           if (Y == 0)
22)           {
23)                Z = Z * Z;
24)           } // end if (Y==2)
25)           else
26)           {
27)                Z = Z + X;
28)           } // end else !(Y==2)
29)           Z = Z + 1;
30)      } // end else !(X<5)
31)      output (X,Y,Z);
32)  } // end else legal inputs
33)  output ("Program ends.");
34)  end;
```

Grading Rubric

13.1) Max of 50 points
For each block (in the CFG) incorrectly created, -5 points

- Incorrectly labeled nodes in the DFG, -1 point each
- Incorrectly labeled edges in the DFG, -1 point each

13.2) Max of 50 points
For each incorrect (added or left out) variable in the dcu/dpu variable/defines pair, dcu, or dpu, -1 point each