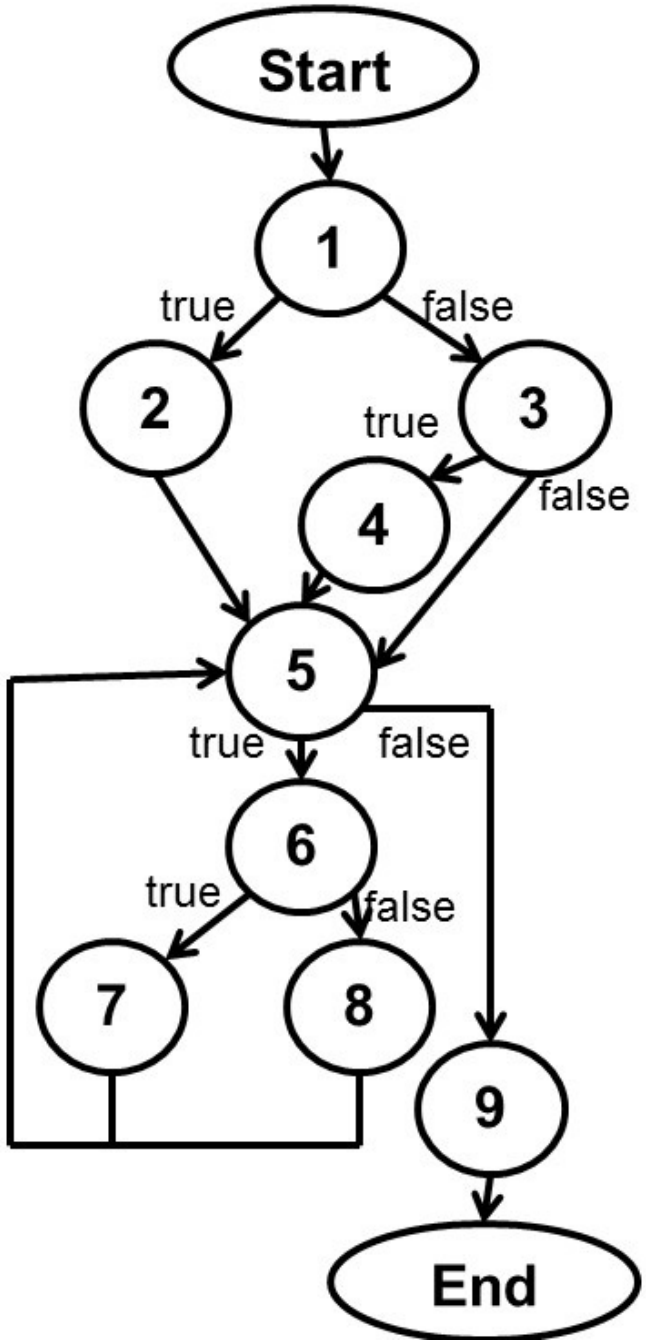
SE 4367 Homework #3, Complexity

a) For the following control flow graph, calculate the cyclomatic complexity. Show your work.



3b) Complexity

For the following structured program P2, calculate the cyclomatic complexity using the structured program decision count rule. Show your work.

```
Program P2
1)   integer A, B;
2)   input (A);
3)
4)   if (A > 7)
5)   {
6)      B = 1;
7)   }
8)   else
9)   {
10)     B = 2;
11)     if (A < 2)
12)        B = 3;
13)  } // end else !A>7
14)
15)  while (i=1; i<=A; i++)
16)  {
17)     if (B<0)
18)     {
19)        B = B + 4;
20)     }
21)     else
22)     {
23)        B = B - 5;
24)     } // end else !B<0
25)  } // end loop
26)
27)  output (A,B);
28)  end;
```

Formatting Submissions

In the file name, include:

- **class**
- **assignment identifier**
- **your name (or team's name)**
  - **e.g., se4367a01jdoe**

In the file (or hardcopy) submitted, include the class, assignment, and name information at the top.

Minus 5 points per violation. Potentially 30 points off for formatting mistakes!

#3a

Calculate cyclomatic complexity.

V(G) = E – N + 2p

E = 14

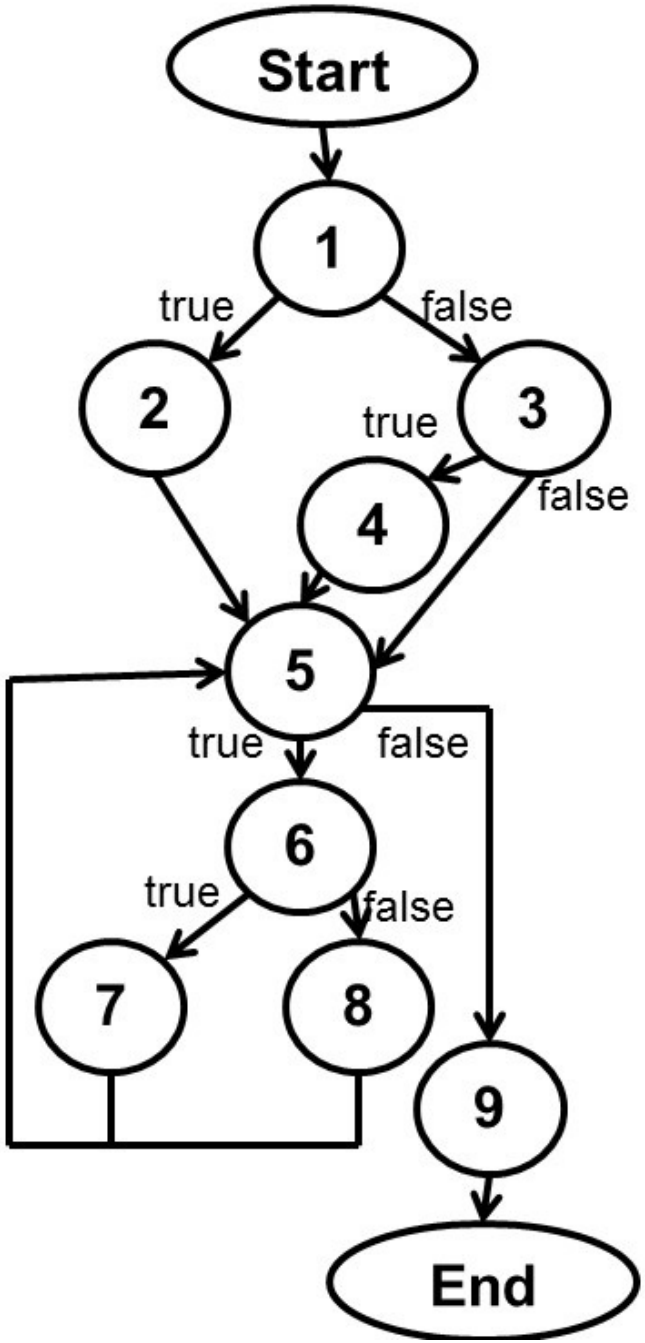
- **nodes 7 and 8 both have edges exiting from them**

N = 11

- **including Start and End**

p = 1

V(G) = 14 – 11 + 2(1) = 5



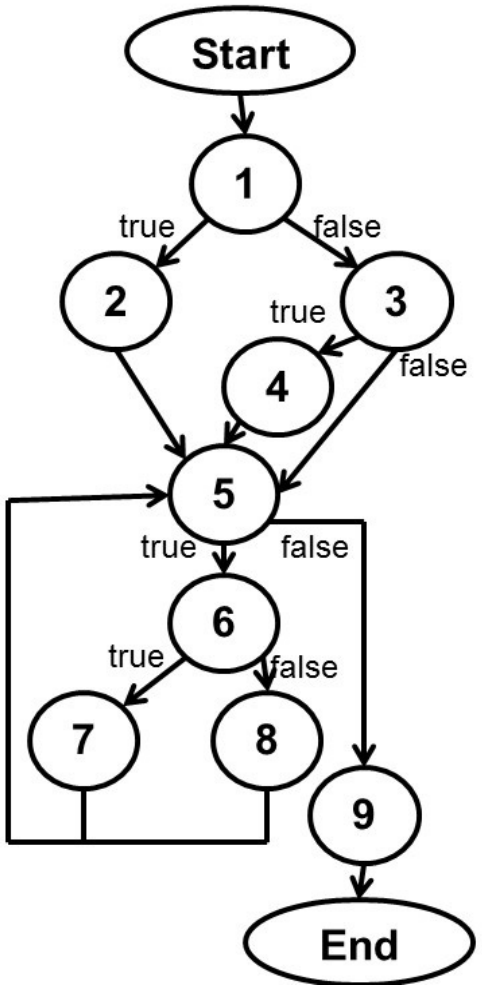
Grading Rubric for Part a (50 pts)

V(G) = E – N + 2p

E = 14	**if off by one, -8 pts**
	off by more, -12 pts
N = 11	**if off by one, -8 pts**
	off by more, -12 pts
p = 1	**if wrong, -12 pts**
V(G) = 5	**if wrong, -14 pts**

- **if E, N, or p were wrong, but the formula was used correctly, -5 pts**

If they didn't show their work and got the wrong answer, -50 points



#3b

For the following structured program P2, calculate the cyclomatic complexity using the structured program decision count rule. Show your work.

Four decisions at lines 4, 11, 15, and 17.

For a structured program, V(G) = #decisions + 1

V(G) = 4 + 1 = 5

```
Program P2
1)   integer A, B;
2)   input (A);
3)
4)   if (A > 7)
5)   {
6)      B = 1;
7)   }
8)   else
9)   {
10)     B = 2;
11)     if (A < 2)
12)        B = 3;
13)  } // end else !A>7
14)
15)  while (i=1; i<=A; i++)
16)  {
17)     if (B<0)
18)     {
19)        B = B + 4;
20)     }
21)     else
22)     {
23)        B = B - 5;
24)     } // end else !B<0
25)  } // end loop
26)
27)  output (A,B);
28)  end;
```

Grading Rubric for Part b (50 points)

Identifying the four decisions at lines 4, 11, 15, and 17, 10 points each (part of "show your work")

Getting V(G) = 4 + 1 = 5 right, -10 points

If they didn't show their work and got the wrong answer, -50 points