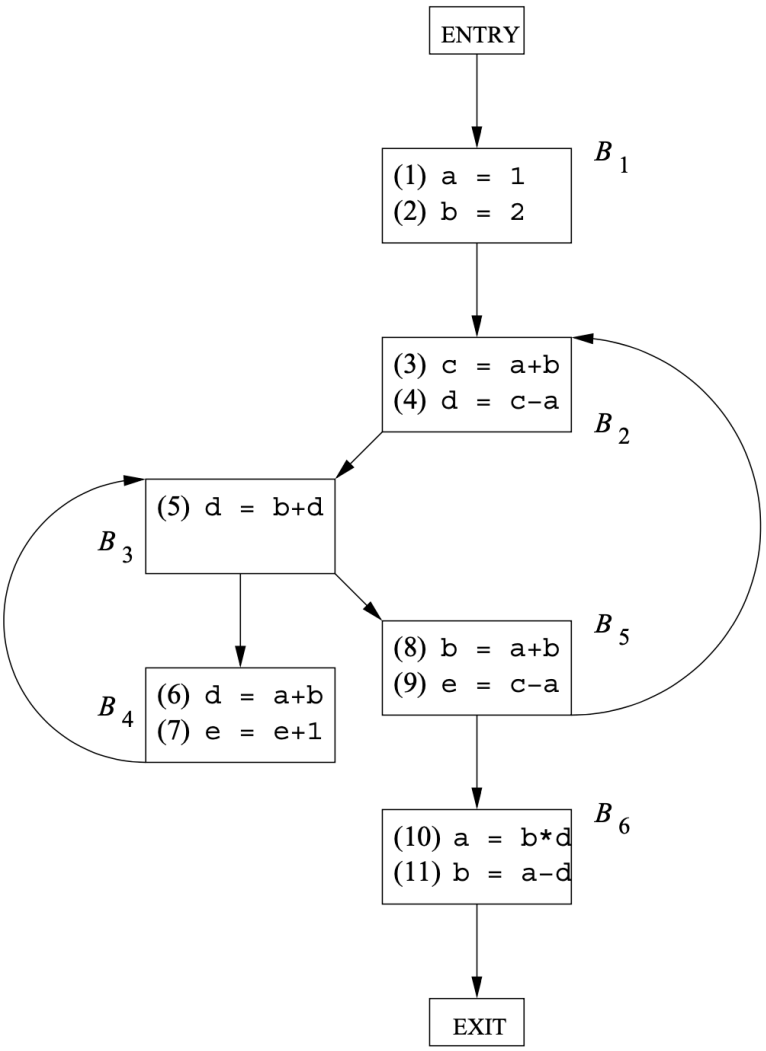
6.1100 Spring 2024 Miniquiz #5

Please submit your answers on Gradescope by April 4th, 2024, 11:59pm.

Name:

Email:

Consider the following control flow graph:



Perform Reaching Definitions analysis, Available Expressions analysis, and Live Variables analysis. Fill your final answers in the table on the following pages.

1. Reaching Definitions

Identify variable definitions by the statement numbers. The first row was filled in for you.

Block	Gen	Kill	In	Out
B_1	{1, 2}	{3, 4, 5, 6, 8, 9, 10, 11}	{}	{1, 2}
B_2				
B_3				
B_4				
B_5				
B_6				

2. Available Expressions

Consider only the following expressions, numbered in the order we provided:

1) a+b
2) c-a
3) b+d

Block	Gen	Kill	In	Out
B_1	{}	{1, 2, 3}	{}	{}
B_2				
B_3				
B_4				
B_5				
B_6				

3. Live Variables

Assume all variables are local, i.e. no variables are live upon exiting B_6.

Block	Gen (Use)	Kill (Def)	In	Out
B_1				
B_2				
B_3				
B_4				
B_5				
B_6	{b, d}	{a, b}	{b, d}	{}

4. Optimization

Optimize the given control flow graph as best you can, using copy propagation, common subexpression elimination, and dead code elimination. You may perform the optimizations by hand and introduce new temporaries as needed.