Allocate registers using the register colouring algorithm discussed in class on a machine with 3 registers. Ignore the impact of “...”.

Can you allocate with two registers? If not, can you rearrange the code within one of more blocks so that you can?
Consider a language which has only non-negative integer variables in the range [0,255]. This language has the following types of statements.

Assignments:
\[ x = k \]  (k is a constant)

Expressions:
\[ x = a \ op \ b \]  (a is a variable and b is a variable or constant and op is either +,-,\*,/)  

Gotos and conditional branches
(No assignments are done to any variables in conditional branch statements.)

We would like to issue two types of warnings:
1. WARNING I: Possible overflow
2. WARNING II: Possible underflow

Example:
\[ y = 16 \]
\[ x = y \times 16 \] (Warning I)

\[ y = 5 \]
\[ x = y - 10 \] (Warning II)

Design a dataflow analysis to generate such warnings.
Run PRE on the following block of code and draw the output after the final stage.