COMP 520 Compilers

Register Allocation in a dataflow graph

Note: This is an exercise, but will not be collected. The solution will be reviewed in class Thu Apr 25.

Consider the following program fragment:

```c
while (x > z) {
    x = (x - z) * 3;
    z = x + 5;
}
y = x;
```

We construct the control flow graph below for this program fragment which has variables \{x, y, z\} and additional temporary variables \{t0, t1, t2, t3\} generated in the conversion to tuple code. Write equations \(L_i\) for variables live at each program point \(i \in \{1, \ldots, 11\}\). Solve the equations by starting from an initial value for the \(L_i\) and iterate till a fixpoint is reached. Using the final values of the \(L_i\), construct the interference graph for the program variables.

How many registers are needed to run this program fragment?