

CS200 lab 12, dependence graphs and topological sort

1. Study the P5 assignment description. Given the following equations:

$$a = 1$$

$$b = 2$$

$$c = 1+2$$

$$d = a+b$$

$$e = 3$$

$$f = -e$$

$$g = f * f$$

$$h = a + b + c + g$$

In the dependence graph we represent an equation by its left hand side identifier.

a. Draw the dependence graph for the above equations, as a graph with nodes and edges, describing which identifiers are needed in the evaluation of which identifiers.

b. Now draw the dependence graph as an array-list of adjacency lists, where an adjacency list has a source, an inDegree, and an array list of destinations.

c. Perform a topological sort of the dependence graph on paper, showing the stages of the algorithm. Write on following lines **all identifiers** that can be evaluated first, next, etc.