

Object-Oriented Programming

6th Weekly Note (E13, Week 50)

Project - Part 2

The second part of the project has started. For more information, please see the course home page:

<http://imada.sdu.dk/~petersk/DM537/#project>

Note that the topic on multivariate trees from the lectures is very relevant for the project, providing an example of a multivariate tree as needed in the project.

Reading for Week 50

Sections 7.2.2, 10.1.3–10.1.7, 10.2.1–10.2.3, 10.3.1, 10.3.3, 10.4.2–10.4.4, 10.5, 11.1.1–11.1.5, and 11.2.1–11.2.2 of “Introduction to Programming Using Java”

Lecture: Monday, December 10, 08-10 (U91)

In this lecture we first repeat last weeks’ most important aspects of (multi-variate) trees. Then we will look at two applications: binary sorting trees and multivariate trees.

Discussion: see detailed schedule on course home page

First discuss Quizzes 9.4–9.8.

Then discuss the differences between pre-order, in-order, and post-order traversal of a binary tree. All these traversals are depth-first traversals, i.e., they first explore one path of the tree to a leaf, before visiting any other node. A depth-first traversal corresponds to using a stack to keep track of the nodes still to visit. If, instead of using a stack, we use a queue, we obtain a breadth-first traversal. Take an example tree and manually play through

both depth-first and breadth-first traversal using a stack and a queue, respectively.

Finally, discuss how breadth-first search using a queue can be used to build a game tree for Tic-Tac-Toe. To this end, discuss how to use the same traversals as discussed before for a multivariate tree, i.e., a tree with an arbitrary number of children (typically represented by a list of children).

Lab: see detailed schedule on course home page

Solve Exercises 10.3 and 10.4. Then implement Quizzes 10.4, 10.9, 10.11.