

Forestry Simulation Project 2

Object Oriented Analysis & Design

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Analysis

Domain:

- Tree
 - species
 - year of planting
 - height
 - growth rate
 - getters
 - grow
- Forest
 - forest name
 - Arraylist of trees
 - methods
- Forestry Simulation
 - main
 - load
 - save
 - Read File

Function Points

- Tree:
 - grow: increase height by growth rate
 - getters
- Forest
 - Print
 - add a tree
 - cut a tree
 - grow a tree
 - reap trees

Scenarios

- cut → three → Error
- reap → ninety → Error
- ~~reap~~ → 70 → out of range

Design

Classes & objects

- Tree class
- Forest class (filled with trees)
- Driver class (Forestry Simulation)

Data

- Tree
 - public enum Species (Maple, Fir, Birch)
 - private Species species
 - private int Year of Planting
 - private double height
 - private double growthRate
- Forest
 - public String name
 - public ArrayList of Trees
 - CONSTANTS (MAX-HEIGHT, ...)

Methods:

- Tree:
 - Constructor (species, Year of planting, height, growthRate)
 - getSpecies, get Year, get Height, get GrowthRate
 - grow \rightarrow void, grows a tree by growthRate
 - toString \rightarrow String
- Forest
 - Constructor (forestName, ArrayList of trees)
 - print \rightarrow void, displays forest
 - addTree(Forest) \rightarrow Forest
 - cutTree(Forest, tree Number) \rightarrow Forest
 - growTrees(Forest) \rightarrow Forest
 - reapTrees(Forest, reapHeight) \rightarrow Forest
- Forestry Simulation
 - main \rightarrow void, switch statement, do-while, try-catch
 - Read File (fileName) \rightarrow ArrayList of Trees
 - Save File (Forest, forestName) \rightarrow void
 - Load File (forestName) \rightarrow Forest