Java Programming @ The department of Computer Science

UNIVERSITY OF LIVERPOOL

Landscape Gardening Quote (with inheritance)

Requirements

Customers provide a landscape gardening company with a plan detailing lawns, concrete patios and water features. Unit material costs and installation times are as shown in the table. Customers who engage our landscape gardening company can specify two types of landscape gardening item (i) Type 1, items specified by length and width (lawns and patios) and (ii) Type 2, items specified by quantity (water features). Both have unit material costs and installation times associated with them. Create a Java class hierarchy that can be used to store, to file, details concerning Type 1 and Type 2 landscape gardening items. Also create an application class that uses this class hierarchy.

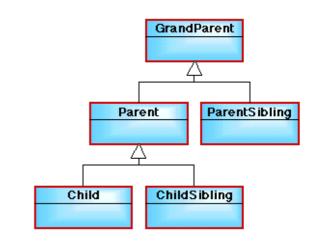| Work to be done	Unit cost of materials	Unit time to install
Laying a lawn	£15.50 per m^2	20 mins per m^2
Laying a concrete patio	£20.99 per m^2	20 mins per m^2
Installing a water feature (e.g. a fountain)	£150.00 each	60 mins each

Note

This exercise is based on an AQA HCSE Specimen Controlled Assessment.

Inheritance

Classes are often arranged in a hierarchy whereby *sub-classes* (child classes) *inherit* features from *super-classes* (parent classes). The advantage is that we do not constantly have to redefine members which have already been defined previously. Inheritance is an important feature of OOP,

Where a class inherits from another class anywhere in the hierarchy, an instance of any sub-class in the hierarchy is also a legal instance of all its super-classes and thus has (at least in principle) all the fields and methods associated with the super classes available to it.

Thus in the figure below an instance of the class Child is also an instance of the class Parent and the class GrandParent (but not the classes ParentSibling and ChildSibling). We say that the class child *extends* the class Parent which in turn *extends* the class GrandParent.

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