

Grouping Data

10-21-2011

Opening Discussion

- Minute essay comments:
 - Getting to grades.
 - Doing an IcP together in class.
 - Meaning of `ArrayIndexOutOfBoundsException`.
 - Fractals, will we make them?
 - Meaning of null.
- Robots and jobs
 - I don't think low end is safe.
 - Timescale is much shorter than past transitions which throws off historical comparisons.

File Stuff

- Let's write a little code with `PrintWriter` and make sure we close things.

Motivation

- Consider things like a Point, a Student, a CD, or a Room in a text game.
- We can use a tuple to group pieces of data together, but this doesn't carry much meaning and leads to ugly, bug-prone code.
- We want a better way to express these groupings that carries more information.

User Defined Types

- The general way we do this is to define our own types.
- For now we will just use these types to collect data together in a case class.
- This allows us to give meaning to the data with meaningful names.
 - `case class TypeName(field1:Type1,field2:Type2,...)`
- Example:
 - `case class NBAPlayer(name:String, team:String, mins>List[Int], points>List[Int], rebounds>List[Int])`

Instantiation

- Once we have defined a case class we can make new objects of that type in one of two ways.
 - `TypeName(expr1,expr2,...)`
 - Or
 - `new TypeName(expr1,expr2,...)`
- Example:
 - `var td=NBAPlayer("Tim Duncan", "Spurs", List(23,13), List(15,17), List(6,8))`

Usage

- We can pull out values using dot notation and the name of the field.
- Example:
 - `println(td.name+" averages "+td.points.sum/td.points.length+" ppg")`
- The fields are vals so you can't change what they reference. You can only change their values if they are mutable.

Copy Method

- There is a copy method on case classes that does what the name implies.
- It can take named arguments to change certain fields in the copy.
- Example:
 - `td=td.copy(mins=17::td.mins, points=15::td.points, rebounds=4::td.rebounds)`

Putting it Together

- In the book I am building an example application of a grade book. I'd like to do something different in class so you see variety.
- Do you have any suggestions or do you want me to come up with something? (CPI handling, player stats, ...)

Minute Essay

- Write the case class you might use for a driver/driver's license.