Grouping Data

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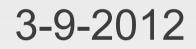
Opening Discussion

- Minute essay comments:
    - What does the map function do?
    - If robots took over would it be like Terminator 4? Would I be up to leading the resistance?
    - Would it be more efficient to make your own file writing code than using PrintWriter?
    - Use of args: file names, flags, etc.
    - Limits on files determined by OS.
    - Does moving IcP #5 push back our schedule?
    - Always close at end of file?
    - Is there a backspace on typewriters?

More

- Why do Java libraries work? Other languages?
- What will automated cars do to car racing?
- Effective use of programming time.
- Educational programming mediums: Scratch and Alice.
- Collections normally in memory. Source is loading from disk.
- Virtual boyfriends/girlfriends.
- Duplicating Watson is relatively cheap. Service.
- IcP solutions.

Midterm

- Median = 77 (without EC)
- Distribution
  - 5 As
  - 7 Bs
  - 10 Cs
  - 5 Ds
  - 5 Fs

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

- What topics would you most like to have video lectures for?

- Imagine you live in a world of abundance where you can have anything that has been created without needing money, but people need to work to create new ideas/designs/technology/science/knowledge. What would you do with your time?