Table Views in iOS

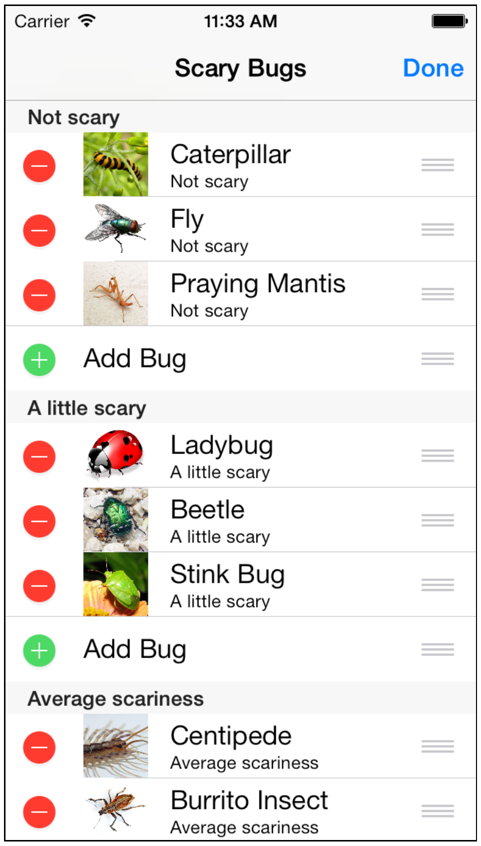
Hands-On Challenges

Table Views: Beginning to Advanced Hands-On Challenges

Challenge #6: Moving Rows

You can now add bugs and delete bugs, so there's only one thing left – moving them around!

This time your challenge is to modify your app to show reorder controls when the app is in edit mode. You should be able to move bugs between sections and have their scary bug factor update accordingly:



See if you can do this on your own based on what you learned on the video. If you get stuck, follow along with the full walkthrough below!

Full Walkthrough

Open the Scary Bugs project where you left it off in the last challenge, or use the starter project provided by the instructor.

Remember from the lecture that there are two methods you need to implement to support moving rows:

1. `tableView(_:canMoveRowAtIndexPath:)`

2. `tableView(_:moveRowAtIndexPath:toIndexPath:)`

Let’s start with the first. Add this new method to the bottom of the file:

```
override func tableView(tableView: UITableView,
  canMoveRowAtIndexPath indexPath: NSIndexPath) -> Bool {

  let bugSection = bugSections[indexPath.section]
  if indexPath.row >= bugSection.bugs.count && editing {
    return false
  }
  return true
}
```

This method returns `true` for any row except for the “Add Bug” row that appears in editing mode. It wouldn’t make sense to let the user move the “Add Bug” row!

Before you can move rows, you’ll need to be able to test sections for equality. The reason is that moving a bug between different sections requires different code from moving a bug in the same section. To make this distinction, you must compare the sections.

Open BugSection.swft and add the following code at the bottom of the file, just underneath the closing brace of the class definition:

```
func ==(lhs: BugSection, rhs: BugSection) -> Bool {
  var isEqual = false
  if (lhs.howScary == rhs.howScary && lhs.bugs.count ==
    rhs.bugs.count) {
    isEqual = true
  }
  return isEqual
}
```

If the bug section has the same howScary enumeration and has the same amount of bugs, then the two sections must be equal. This is a rather a simple test for equality, but it will work for the purposes of this challenge.

Next, add the second required method:

```
override func tableView(tableView: UITableView, moveRowAtIndexPath
  sourceIndexPath: NSIndexPath, toIndexPath destinationIndexPath:
  NSIndexPath) {

  // 1
  let sourceSection = bugSections[sourceIndexPath.section]
```

```
    let bugToMove = sourceSection.bugs[sourceIndexPath.row]
    let destinationSection =
      bugSections[destinationIndexPath.section]

    // 2
    if sourceSection == destinationSection {
      swap(&destinationSection.bugs[destinationIndexPath.row],
        &sourceSection.bugs[sourceIndexPath.row])
    }

    // 3
    else {
      bugToMove.howScary = destinationSection.howScary
      destinationSection.bugs.insert(bugToMove, atIndex:
        destinationIndexPath.row)
      sourceSection.bugs.removeAtIndex(sourceIndexPath.row)
    // 4
    }
  }
```

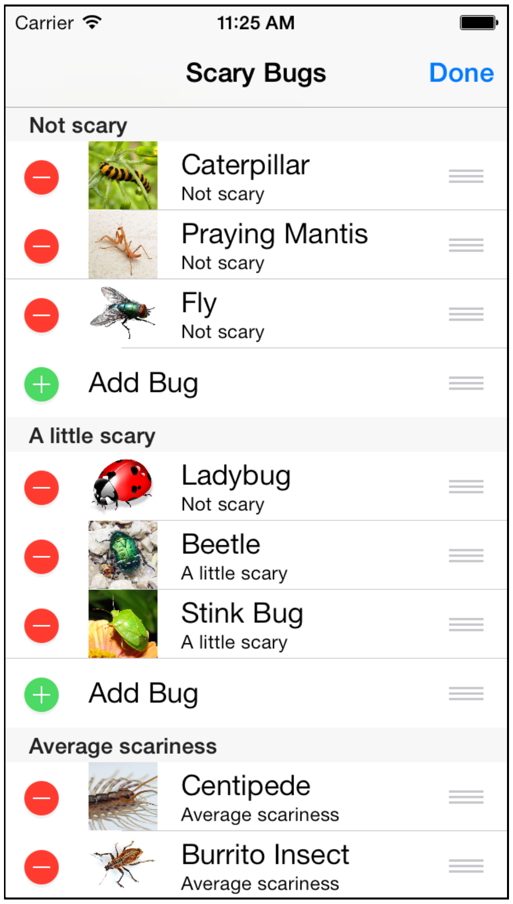
3. Since you have implemented `tableView(_:canMoveRowAtIndexPath:)`, the table view will display the reorder control for all rows, and implements the code to let the user drag and drop rows using the reorder control.

When the user drops a row into a new location, this method is called. The table view already knows about the move, so you only need to update your model appropriately in this method.

There's a lot of code here, so let's go over it section by section:

1. Determines the source `BugSection`, the destination `BugSection`, and the `ScaryBug` to move.
2. If the bug is being moved within the same section (i.e. within the same array), the best way to swap the bug position is with the `swap()` global function.
3. If the bug is being moved to a new section, you need to insert the bug in the new section at the right spot, and remove it from the old section. You also update the `howScary` on the bug, because in this app each section represents a certain scariness level of bugs.
4. You'll be adding some extra code here later on.

Build and run, and tap the Edit button to make the reorder controls appear. You'll notice that switching bugs within sections works fine (see the Fly moved down), however if you drag a bug to a different section the cell doesn't refresh (see the Ladybug):



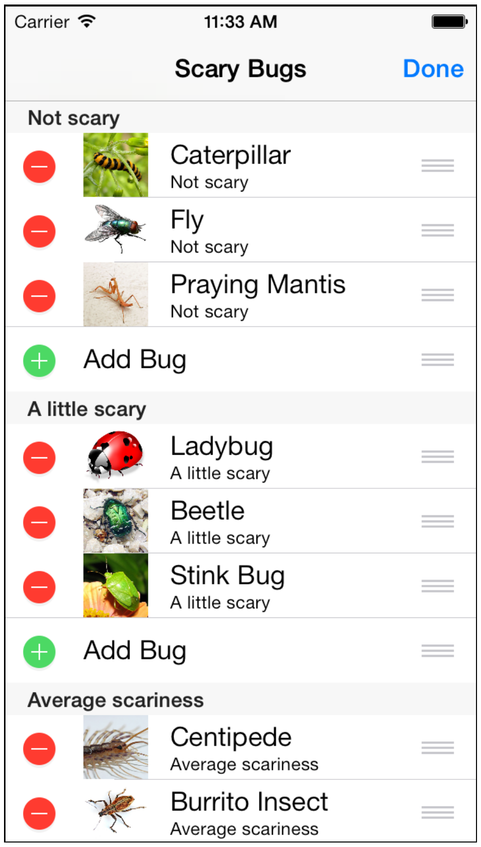
To fix the refreshing issue, you'd think that you could just call `reloadRowsAtIndexPaths(_:withRowAnimation:)` at section #4, however that doesn't work. It causes some strange behavior with the table view, such a blank row and mismatched cells – likely due to the fact that when moving a cell, the row you are moving is in a temporary "move" state.

5. So to fix this, add the following code to section #4 in `tableView(_:moveRowAtIndexPath:toIndexPath:)`

```
let delayInSeconds:Double = 0.2
let dispatchTime = Int64(delayInSeconds * Double(NSEC_PER_SEC))
let popTime = dispatch_time(DISPATCH_TIME_NOW, dispatchTime)
dispatch_after(popTime, dispatch_get_main_queue()) { () -> Void in
  self.tableView.reloadRowsAtIndexPaths([destinationIndexPath],
    withRowAnimation: .None)
}
```

This is some code that executes a block of code on the main thread after a delay of 0.2 seconds to refresh the moved cell, effectively waiting until the move animation completes. I'm not sure if there is a better way to do this; if anyone comes up with a good way, please let me know. (And by the way don't say reloadData on table view; the goal is to reload a single cell, not the entire table view!)

Build and run and you'll see if you move a bug to a new section it reloads correctly now:



However, there's one bug left. Currently if you try to move a row right below the "Add Bug" row, the app will crash.

It doesn't make sense to allow a user to move a row below the Add Bug row, so you need a way to prevent the user from moving a row to certain spots. To do this, add the following new method:

```
override func tableView(tableView: UITableView,
  targetIndexPathForMoveFromRowAtIndexPath sourceIndexPath:
  NSIndexPath, toProposedIndexPath proposedDestinationIndexPath:
  NSIndexPath) -> NSIndexPath {

  let bugSection =
    bugSections[proposedDestinationIndexPath.section]
  if proposedDestinationIndexPath.row >= bugSection.bugs.count {
    return NSIndexPath(forRow: bugSection.bugs.count-1, inSection:
      proposedDestinationIndexPath.section)
  }
```

```
    return proposedDestinationIndexPath
  }
```

This method is called whenever the user tries to drag a row to a new spot, and gives you a chance to say yay or nay (by returning an alternative spot).

Here you check to see if the user is trying to drag the row below the “Add Bug” row, and if so you return the index path for the last valid spot before that point.

Build and run, and you can now reorder in style!