Welcome to CS193P

XCode, Debugging, and Secrets to Improving Your Grade

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Announcement

- Assignment 2 due next TUESDAY, not Thursday

What We’ll Cover

- XCode Interface Walkthrough
  - Tips, tricks, useful settings
- Documentation
  - How to navigate
- Debugging Best Practices
  - NSLog is not the only way
- Hands-On Debugging Exercises
  - Have your laptops ready!

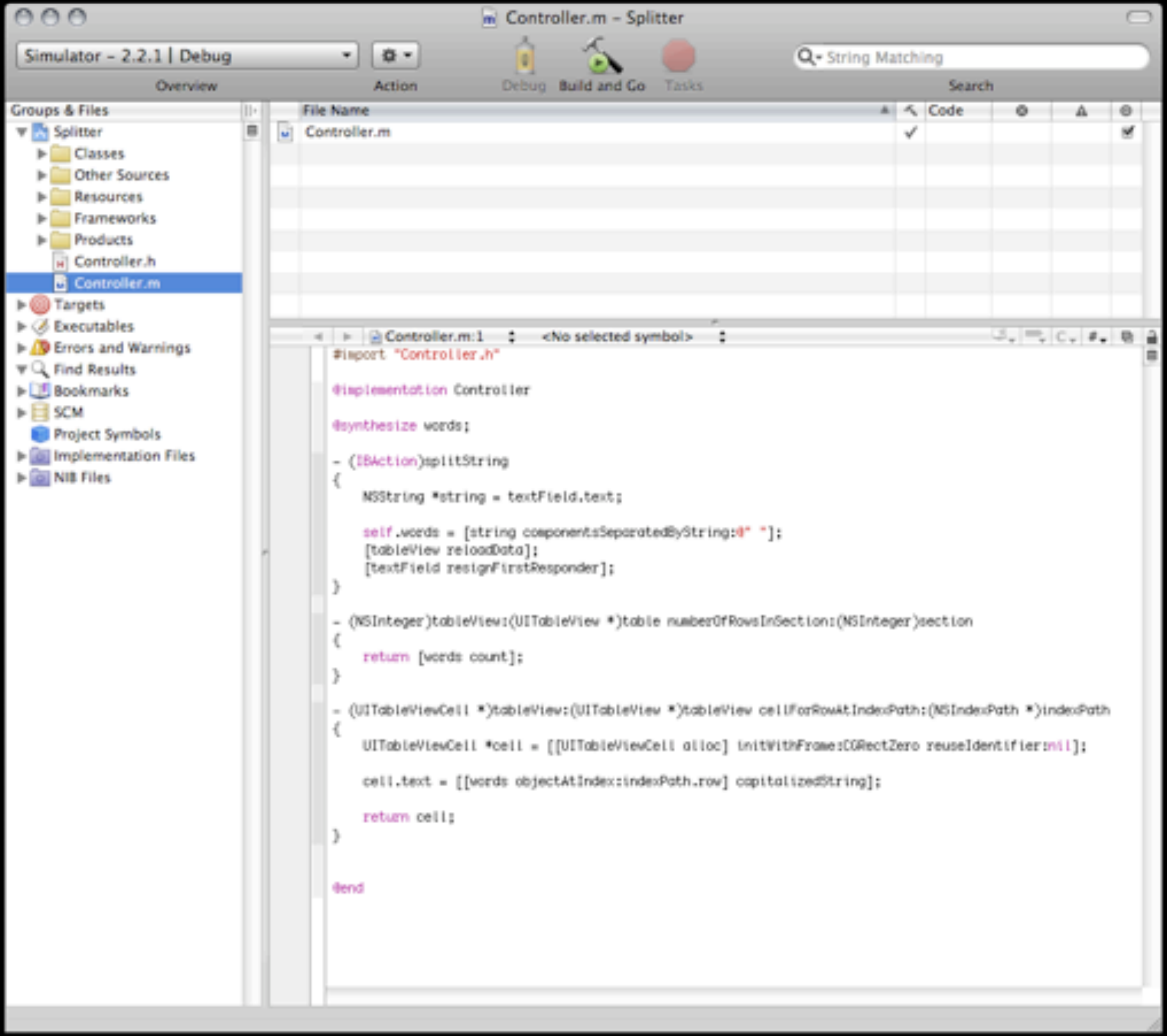
XCode Interface

First...

- Download today's exercises
  - http://www.stanford.edu/class/cs193p/downloads/Section-1-Exercises.zip

XCode Walkthrough

- Open the Splitter-working project
- Build-and-Go to make sure it works



```
#import "Controller.h"

@implementation Controller

@synthesize words;

- (IBAction)splitString
{
    NSString *string = textField.text;

    self.words = [string componentsSeparatedByString:@" "];
    [tableView reloadData];
    [textField resignFirstResponder];
}

- (NSInteger)tableView:(UITableView *)table numberOfRowsInSection:(NSInteger)section
{
    return [words count];
}

- (UITableViewCell *)tableView:(UITableView *)tableView cellForRowAtIndexPath:(NSIndexPath *)indexPath
{
    UITableViewCell *cell = [[UITableViewCell alloc] initWithFrame:CGRectZero reuseIdentifier:nil];

    cell.text = [[words objectAtIndex:indexPath.row] capitalizedString];

    return cell;
}


@end
```

Splitter Demo

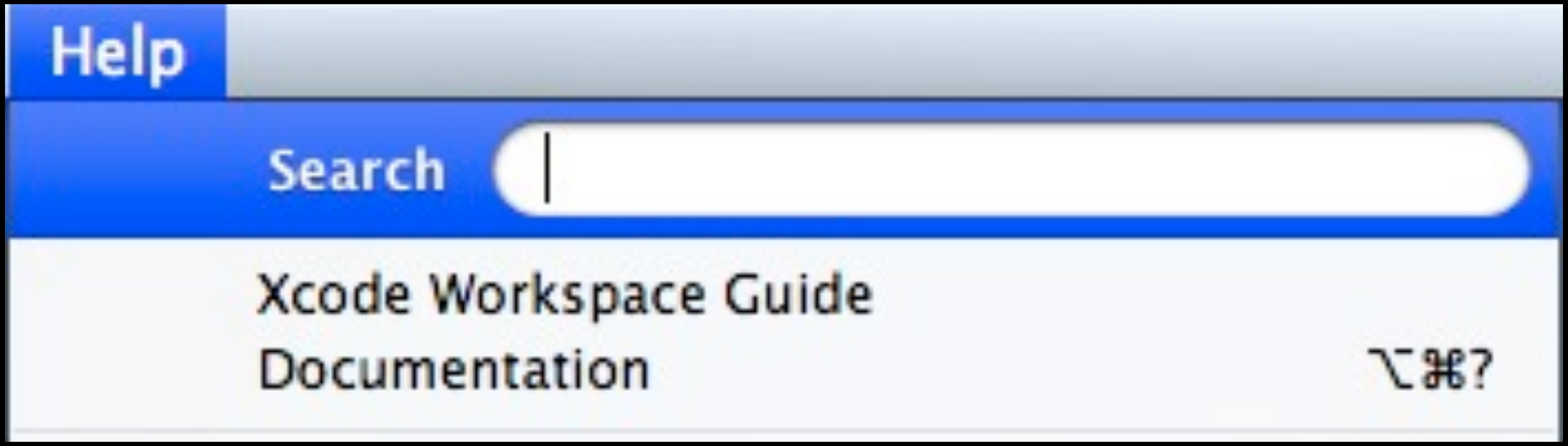
Splitter Demo Notes

- show how splitter works
- recommend the following settings:
  - XCode->Preferences->Text Editing->Show line numbers
  - XCode->Preferences->Text Editing->Show page guide
  - XCode->Preferences->Debugging->On Start:->Show Console
  - XCode->Preferences->Debugging->On Start:->Auto Clear Debug Console
- quick runthrough of generated files and what’s important, what’s not
- show file history navigation
- show symbol selector
- show counterpart switcher
- show toolbar profile selector
- show toolbar customization

Navigating the Documentation

Finding Answers

- Documentation built into Xcode
- Two ways to navigate
  - Browse
  - Search



Documentation Demo

Documentation Demo Notes

- Browsing
  - Help->Documentation
  - Doc Sets->Apple iPhone OS 2.2.1->Subscribe
  - Explore top-level “iPhone Reference Library” page
  - Explore navigation tree on left
  - Fantastic resources for beginners:
    - “Getting Started”
    - “Guides”
    - “Sample Code”

Documentation Demo Notes

- Search
  - Browsing is useful when you want to learn a new concept, searching is better when you're in the middle of coding
  - Back to splitter-working
  - Navigate to Controller.m
  - ctrl-click NSString->Find Selected Text In API Reference
  - Filter results: Select Apple iPhone OS 2.2.1 button instead of All Doc Sets on filter bar below the toolbar
  - Filter results: API Options button->Uncheck all but C and Obj C
  - Explore reference page, compare to Java API page
  - ctrl-F for capital
  - Back to splitter-working
  - Find out what resignFirstResponder does

Debugging: Life After NSLog

Two Ways to Debug

- Not So Awesome: NSLog
  - Useful in some situations, like debugging race conditions
  - Not as useful when just inspecting variables
- Oh So Awesome: Debugger
  - Best way to fix bugs
  - Set breakpoints, step through code, inspect variables

Debugger Demo

Debugger Demo Notes

- NSLog
  - Navigate to Controller.m
  - NSLog the textField.text value
  - Build and go
  - Check console for output
  - Works, but had to write unnecessary extra code

- Debugger
  - Set breakpoint on NSString *string = textField.text;
  - Build and go
  - Step over after breakpoint
  - Inspect value via hover
  - Inspect value via debugger window

Hands-On Debugging Exercises

Try it Yourself

- Run Warmup-working to see what it does
- Run Splitter-working to see what it does
- For each of the 6 exercises:
    - 1) In the project, select Debug (not Run or Go)
    - 2) Determine what the error is
    - 3) Locate the problematic line
    - 4) Fix the bug
    - 5) Understand **why** the fix worked

Debugging Exercises

Debugging Exercise Notes

- Warmup-exercise1
  - should be quick and easy
- Warmup-exercise2
  - hint 1: check the debugger window
  - hint 2: look at the last line printed out
- Warmup-exercise3
  - hint 1: check the debugger window
  - hint 2: check the API
- Splitter-exercise1
  - hint: the problem can’t be fixed through XCode
- Splitter-exercise2
  - hint: check the debugger window
- Splitter-exercise3
  - hint 1: the error message doesn’t really help
  - hint 2: think back to last lecture about properties and mem mgmt

How To Code Harder, Better, Faster, Stronger

Mac OS X Essential Hotkeys

- For those new to Mac OS X:
  - ⌘-x/c/v: cut/copy/paste
    - ⌘ = command key
  - ⌘-Space bar: spotlight
    - Open applications, do arithmetic, find files
  - ⌘w: close current window
  - ⌘q: close current application
  - ⌘~: switch to next window within application
  - ⌘-Delete: send file to trash

XCode Essentials Hotkeys

- For those new to XCode:
  - Escape: Auto-complete
    - Works anytime you’re typing class, method, ivar, etc
    - Try hitting escape after “[NSString “ to see all methods
  - ⌘Enter: Build and Go
  - ⌘/: Toggle comment
  - ⌘}: Indent right
  - ⌘{: Indent left
  - ⌥⌘↑: Switch between header/source file
    - ⌥ = option key

Questions?