**Chapter 9 [Phase 1]: UITableView and UITableViewController**

**Step 1:** Create a new iOS Empty Application project [Product Name/Class Prefix: Homepwner; Device: iPhone; Check “Use Automatic…”].

**Step 2**: Write a subclass ItemsViewController of UITableViewController: File 🡪 New 🡪 File.... 🡪 Cocoa Touch [iOS section] 🡪 Objective-C class 🡪 Next 🡪 Class: ItemsViewController, Subclass of: UITableViewController 🡪 Next 🡪 Create.

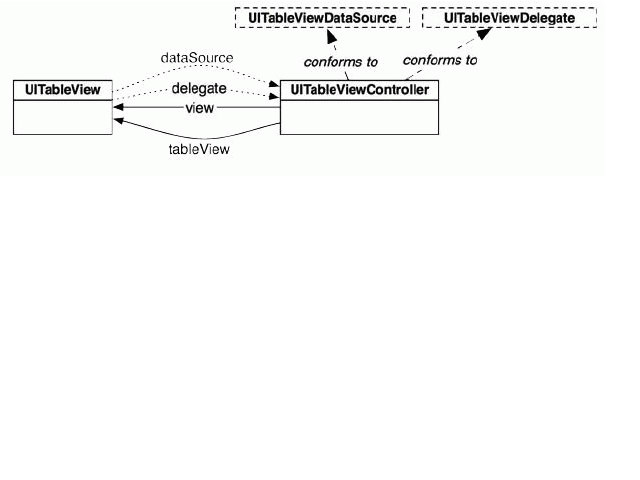
A **UITableView** displays a single column of data with rows. UITableView is a view object [draws itself but no logic or data].

* Needs a **view controller** [appearance on the screen].
* Needs a **data source** [the number of rows to display, the data to be shown in rows]. Without a data source, a table view is just an empty container.
* Needs a **delegate** that can inform other objects of events involving the UITableView [any object that conforms to the UITableViewDelegate protocol].

🡪 An instance of the class **UITableViewController** fills all three roles: view controller, data source, and delegate.

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**PART I: View Controller**



**UITableViewController** [a subclass of UIViewController] has a view [an instance of UITableView]. UITableViewController handles the UITableView.

**initWithStyle:** [the designated initializer of UITableViewController - determines the style of the table view]. Two options: **UITableViewStylePlain** [each row is a rectangle], **UITableViewStyleGrouped** [top/bottom rows have rounded corners].

**ItemsViewController.m**:

// All instances of ItemsViewController will use the UITableViewStyleGrouped style.-

- (id)init

{

// Call the superclass's designated initializer.

self = [super initWithStyle:UITableViewStyleGrouped];

if (self)

{ }

return self;

}

- (id)initWithStyle:(UITableViewStyle)style

{

return [self init];

}

**HomepwnerAppDelegate.m**: [import ItemsViewController.h]

- (BOOL)application:(UIApplication \*)application didFinishLaunchingWithOptions:(NSDictionary \*)launchOptions

{

self.window = [[UIWindow alloc] initWithFrame:[[UIScreen mainScreen] bounds]];

// Create an instance of ItemsViewController.

ItemsViewController \*itemsViewController = [[ItemsViewController alloc] init];

// Set itemsViewController as the rootViewController of the window.

[[self window] setRootViewController:itemsViewController];

self.window.backgroundColor = [UIColor whiteColor];

[self.window makeKeyAndVisible];

return YES;

}

**Result**: The default plain UITableView with no content [an empty table view] is on the screen. A UITableViewController inherits the **view method** from its superclass UIViewController which calls **loadView method** [creates and loads an empty view object if none exists].

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**Step 3**: Import Item.h and Item.m from Chapter 3. [Drag the files onto the project window 🡪 Check: “Copy items…“ - it copies the files from their current directory to the project’s directory on the filesystem and adds them to the project.]

**Item.h**:

@interface Item : NSObject

{}

+ (id)randomItem;

- (id)initWithItemName:(NSString \*)name

valueInDollars:(int)value

serialNumber:(NSString \*)sNumber;

@property (nonatomic, copy) NSString \*itemName;

@property (nonatomic, copy) NSString \*serialNumber;

@property (nonatomic) int valueInDollars;

@property (nonatomic, readonly, strong) NSDate \*dateCreated;

@end

**Item.m**:

#import "Item.h"

@implementation Item

@synthesize itemName, serialNumber, dateCreated, valueInDollars;

+ (id)randomItem

{

// Create an array of three adjectives

NSArray \*randomAdjectiveList = [NSArray arrayWithObjects:@"Fluffy", @"Rusty", @"Shiny", nil];

// Create an array of three nouns

NSArray \*randomNounList = [NSArray arrayWithObjects:@"Bear", @"Spork", @"Mac", nil];

// Get the index of a random adjective/noun from the lists. The adjectiveIndex is a random number from 0 to 2 inclusive.

NSInteger adjectiveIndex = rand() % [randomAdjectiveList count];

NSInteger nounIndex = rand() % [randomNounList count];

// Create random name, value and a serial number

NSString \*randomName = [NSString stringWithFormat:@"%@ %@",

[randomAdjectiveList objectAtIndex:adjectiveIndex],

[randomNounList objectAtIndex:nounIndex]];

int randomValue = rand() % 100;

NSString \*randomSerialNumber = [NSString stringWithFormat:@"%c%c%c%c%c",

'0' + rand() % 10, 'A' + rand() % 26, '0' + rand() % 10, 'A' + rand() % 26, '0' + rand() % 10];

// Ignore the memory problems

Item \*newItem =

[[self alloc] initWithItemName:randomName

valueInDollars:randomValue

serialNumber:randomSerialNumber];

return newItem;

}

- (id)initWithItemName:(NSString \*)name

valueInDollars:(int)value

serialNumber:(NSString \*)sNumber

{

// Call the superclass's designated initializer

self = [super init];

// Did the superclass's designated initializer succeed?

if(self)

{

// Give the instance variables initial values

[self setItemName:name];

[self setSerialNumber:sNumber];

[self setValueInDollars:value];

dateCreated = [[NSDate alloc] init];

}

// Return the address of the newly initialized object

return self;

}

- (id)init

{

return [self initWithItemName:@"Possession"

valueInDollars:0

serialNumber:@""];

}

- (NSString \*)description

{

NSString \*descriptionString =

[[NSString alloc] initWithFormat:@"%@ (%@): Worth $%d, recorded on %@", itemName, serialNumber, valueInDollars, dateCreated];

return descriptionString;

}

@end

**Step 4**: Write a class ItemStore: File 🡪 New 🡪 File.... 🡪 Cocoa Touch [iOS section] 🡪 Objective-C class 🡪 Next 🡪 Class: ItemStore, Subclass of: NSObject 🡪 Next 🡪 Create.

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**PART II: Data Source**

In Cocoa Touch, the table view object asks another object [its dataSource] what it should display.

**Homepwner:** Data source [ItemsViewController] will store item data. The NSMutableArray [holds the Item instances] will be abstracted into another object [ItemStore]. If an object wants to see all of the items, it will ask the ItemStore for the array that contains them.

**ItemStore** is a singleton [only one instance in the app – many objects talk to it]. When another instance is created, the class will return the existing instance instead. Those objects can ask the singleton class for its one instance, instead of passing that instance as an argument to every method that will use it.

* **sharedStore method** – gets the ItemStore instance. If ItemStore instance created, returns the instance. If not, creates the instance and returns it.
* **sharedStore variable** is **static** - does not live on the stack, declared when the app is loaded into memory, and never destroyed. Access variable in the method in which it is declared. No other object or method can use the variable except via the sharedStore method. The initial value of sharedStore is nil. The first time this method runs, an instance of ItemStore will be created, and sharedStore will be set to point to it.
* **The singleton status** of ItemStore – only one instance of ItemStore can be allocated. **allocWithZone**: [overridden method] returns single ItemStore instance. Send allocWithZone: to super - skips trap and gets an instance of ItemStore when needed. Not sending allocWithZone to NSObject causes loop.
* **@Item directive** - tells the compiler that there is a Item class but it doesn’t need to know this class’s details in the current file. Using the class without importing it - speeds up compile times considerably because fewer files have to be recompiled when one file changes. The class must import the file when it sends messages to the Item class or instances of it.

**ItemStore.h:**

#import <Foundation/Foundation.h>

@class Item;

@interface ItemStore : NSObject

{

NSMutableArray \*allItems;

}

+ (ItemStore \*)sharedStore;

- (NSArray \*)allItems;

- (Item \*)createItem;

@end

**ItemStore.m:**

#import "ItemStore.h"

#import "Item.h"

@implementation ItemStore

+ (ItemStore \*)sharedStore

{

static ItemStore \*sharedStore = nil;

if(!sharedStore)

sharedStore = [[super allocWithZone:nil] init];

return sharedStore;

}

+ (id)allocWithZone:(NSZone \*)zone

{

return [self sharedStore];

}

- (id)init

{

self = [super init];

if(self)

allItems = [[NSMutableArray alloc] init];

return self;

}

- (NSArray \*)allItems

{

return allItems;

}

- (Item \*)createItem

{

Item \*p = [Item randomItem];

[allItems addObject:p];

return p;

}

@end

**ItemsViewController.m [continued]**:

#import "Item.h"

#import "ItemStore.h"

// All instances of ItemsViewController will use the UITableViewStyleGrouped style.-

- (id)init

{

…

if (self)

{

// Add 5 random items to the ItemStore

for(int i = 0; i < 5; i++)

[[ItemStore sharedStore] createItem];

}

…

}

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**Step 5**: Create a row for each entry in the store. Each cell will display the description of an Item as its textLabel.

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**PART III: Delegate**

For ItemsViewController to conform to UITableViewDataSource, it must implement **tableView:numberOfRowsInSection:** [tells the table view how many rows to display] and **tableView:cellForRowAtIndexPath:** [tells the table view what content to display in each row].

**ItemsViewController.m:**

-(NSInteger)tableView:(UITableView \*)tableView

numberOfRowsInSection:(NSInteger)section

{

// Obtain the number of rows in the section.

return [[[ItemStore sharedStore] allItems] count];

}

Table views have sections, each section has its own set of rows. A table has a one column, a column has many cells, and a row has only one cell [Hierarchy: UIView 🡪 UITableView 🡪 UITableViewCell (subviews of contentView: textLabel, detailTextLabel, imageView; accessory indicator such as check mark)].

**Reusing UITableViewCells:** To preserve the lives of iOS devices, reuse table view cells. When the user scrolls the table, some cells move offscreen.

Offscreen cells are put into a pool of cells available for reuse. Then, instead of creating a brand new cell for every request, the data source first checks the pool. If there is an unused cell, the data source configures it with new data and returns it to the table view.

In **ItemsViewController.m**, implement **tableView:cellForRowAtIndexPath:** so that the nth row displays the nth entry in the allItems array.

- (UITableViewCell \*)tableView:(UITableView \*)tableView cellForRowAtIndexPath:(NSIndexPath \*)indexPath

{

// Create an instance of UITableView with default appearance. Check for a reusable cell first, use that if it exists.

UITableViewCell \*cell = [tableView dequeueReusableCellWithIdentifier:@"UITableViewCell"];

// If there is no reusable cell of this type, create a new one

if(!cell)

cell = [[UITableViewCell alloc]

initWithStyle:UITableViewCellStyleDefault

reuseIdentifier:@"UITableViewCell"];

// Set the text on the cell with the description of the item. That is the nth index of items, where n = row this cell will appear in on the tableview.

Item \*p = [[[ItemStore sharedStore] allItems] objectAtIndex:[indexPath row]];

[[cell textLabel] setText:[p description]];

return cell;

}

**Result**: a UITableView populated with a list of random Items.

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