iOS Dev Accelerator
Week 6 Day 2

- UIDatePicker & UIPickerVIew
- Date Handling
- Advanced Fetching

UIDatePicker

UIDatePicker

- “The UIDatePicker class implements an object that uses multiple rotating wheels to allow users to select dates and times”
- Can also be used as a countdown timer.
- Has a date property that simply returns the current selected date in the date picker
- You can also hook up an IBAction that fires anytime the date has changed
- Has an intrinsic width of 320, you can squeeze it down to 240 and still see everything though
- Has options in the storyboard attribute inspector

Demo

UIPickerView

- UIPickerView is similar to a DatePicker, but allows you to fully customize what the picker displays instead of just Dates & Times.
- Basic Workflow for a UIPickerView:
  - Drag out your picker view from storyboard and make an outlet, or create the picker view in code.
  - Set your view controller to be the pickers datasource
  - Implement:
    - numberOfComponentsInPickerView:
    - pickerView:numberOfRowsInComponent:
    - pickerView:titleForRow:ForComponent:

NSDate & NSDateFormatter

Dates & Time

- There are 3 primary classes you will use when representing time in your apps:
  - NSDate - a representation of a single point in time
  - NSCalendar - a representation of a particular calendar type (Buddhist, Chinese, Hebrew, etc)
  - NSDateComponents - a representation of particular parts of a date, like an hour, minute, day, year, etc.

Dates

- NSDate represents a single point in time.
- Date objects are immutable once created
- The standard unit of time for date objects is floating point value typed as NSTimeInterval expressed in seconds.
- NSDate computes times as seconds relative to an absolute reference time: the first instant of January 1, 2001, GMT.
- Dates before that time are stored as negative values. Dates after stored as positive.

Creating Date Objects

- To get a date that represents the exact current time:
    1. just init a NSDate instance OR
    2. use the class method .date on NSDate
- To create a specific date:
    1. Use one of NSDate's initWithTimeInterval init methods
    2. Use an NSCalendar and date components

Demo

Basic Date Calculations

- There are many ways to compare dates:
  - isEqualToDate:
  - compare:
  - laterDate:
  - earlierDate:
- and you can also use the method timeIntervalSinceDate: on NSDate to get the time interval from 2 dates

Date Calculations

- Use the dateByAddingComponents:toDate:options: on a calendar to add components (hours, minutes, days,years) to an existing date. They can be negative values to take time away as well.

Demo

Calendars

- You use calendar objects to convert between times and date components (years, days, minutes, etc)
- NSCalendar provides an implementation for many different types of calendars.
- Calendar types are specified by constants in NSLocale.
- the method currentCalendar returns the user’s preferred locale.

Date Components

- You can represent a component of a date using the NSDateComponent class.
- Use methods setDay:, setMonth:, and setYear: to set those individual components.

Putting it all together: Using Dates, Date Components, and Calendars.

- You can grab the components of a date using the method components:fromDate: on the class NSCalendar:
  - The components parameter actually takes in a bit mask composed of Calendar Unit constants.
- You can create a date from components by creating a component, a calendar, and then running dateFromComponents: on the calendar.

Demo

NSDateFormatter

- NSDateFormatter is a subclass of NSFormatter, which has a wide range of specialized subclasses:
  - NSNumberFormatter
  - NSDateFormatter
  - NSByteCountFormatter
  - NSDateFormatter
  - NSDateComponentsFormatter
  - NSDateIntervalFormatter
  - NSEnergyFormatter
  - NSMassFormatter
  - NSLengthFormatter
  - MKDistanceFormatter

NSDateFormatter

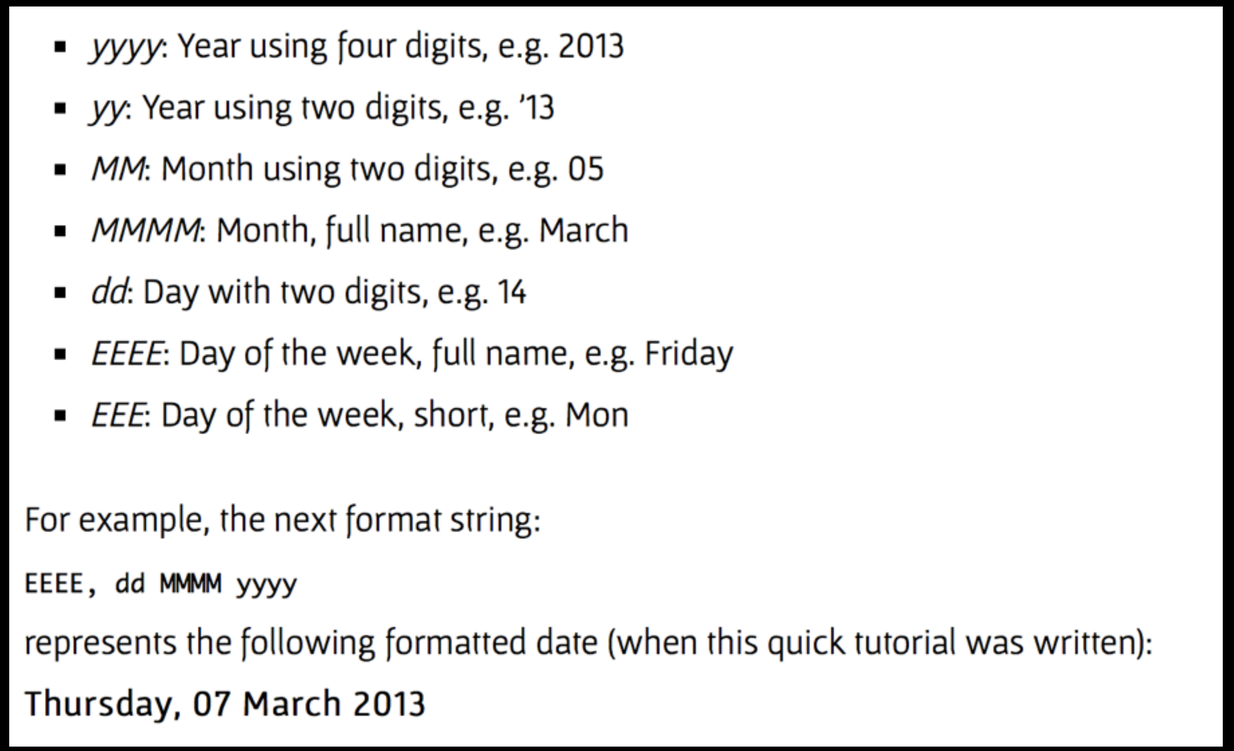
- You use an NSDateFormatter to get text representations of both dates and times
- You can set the NSDateFormatter's style to set the desired style of date:

1. *NSDateFormatterNoStyle*: No style.
2. *NSDateFormatterShortStyle*: 12/18/13
3. *NSDateFormatterMediumStyle*: Dec 18, 2013
4. *NSDateFormatterLongStyle*: December 18, 2013
5. *NSDateFormatterFullStyle*: Wednesday, December 18, 2013

*sourced from http://gtiapps.com/?p=1086

Custom style

- If none of the pre-baked styles fit your needs, you can create a custom date format using the setDateFormat: method.
- This takes in a format string that follows a specific pattern:



- *yyyy*: Year using four digits, e.g. 2013
- *yy*: Year using two digits, e.g. '13
- *MM*: Month using two digits, e.g. 05
- *MMMM*: Month, full name, e.g. March
- *dd*: Day with two digits, e.g. 14
- *EEEE*: Day of the week, full name, e.g. Friday
- *EEE*: Day of the week, short, e.g. Mon

For example, the next format string:

`EEEE, dd MMMM yyyy`

represents the following formatted date (when this quick tutorial was written):

Thursday, 07 March 2013

*sourced from http://gtiapps.com/?p=1086

Demo

Advanced Fetching*

*Sourced from NSHipster

More Fetching

- Yesterday we learned what core data is, how to use it, how to insert objects, and how to do a very simple fetch.
- Our fetch just retrieved all the objects for a certain Entity.
- Thats great, but what if we wanted to get more specific with our query?
- Sometimes we don't necessarily always want ALL the objects from a certain entity, that could literally be millions of objects!
- We can configure our fetches to be much more specific. Lets take a look.

When to Fetch?

- Sometimes you don't need to do a fetch, you already have the data you need.
- Relationships are a much more efficient way to traverse your object graph vs fetch requests.
- You typically only need to fetch if
  - a) you haven’t done a fetch yet
  - b)you need to search your object graph for specific items that match specific criteria

Creating Fetch Requests

- Theres actually 4 different ways for fetch requests to be created:
    1. Using its plain initializer
    2. Using its initializer that takes in a entity name that you want to fetch against
    3. Accessing a fetch request that we pre-made in the MOM file (cool)
    4. Same as 3, but there is a method you can use to pass in extra variables for the fetch to be used in the predicate

Creating Fetch Requests in the MOM file

- Creating a pre-defined fetch request in the MOM is safe & easy!
- Its usually best to do this if you find yourself coding the same fetch over and over again.
- Pretty straight forward process

Demo

NSPredicate

- Query language describing how data should be fetched and filtered
- Describes logic conditions to use when searching collections
- Used in Core Data, but can also be used to filter regular foundation classes like arrays and sets.
- Familiar with SQL? Think of the WHERE clause

NSPredicate String syntax

- When creating a predicate, you use a predicate string to communicate to the database what exactly you are looking for.
- The predicate string parser is whitespace insensitive, case insensitive, and supports nested parenthetical expressions.
- The parser does not do any semantic type checking, so typos will cause run time errors.

```
NSString *lastNameSearchString = @“Wilson”;
[NSPredicate predicateWithFormat:@“lastName like %@”, lastNameSearchString];
```

This evaluates to fetching all person entities with the attribute lastName like “Wilson“

NSPredicate

- Use predicateWithFormat for building simple predicates
- You can use %@ to substitute for an object value (usually a string)
- You can use %K to substitute for an attribute or attributes (via keypath)

```
[NSPredicate predicateWithFormat:@"name = 'Clarus'"];
[NSPredicate predicateWithFormat:@"species = %@", @"Dogcow"];
[NSPredicate predicateWithFormat:@"%K like %@", attributeName, attributeValue];
```

(In the example above, if you had done “%@ like %@“, the query would be incorrect because %@ substitutes always add quotes to the string value. You never want quotes around the attribute you are querying against.)

- Predicates will traverse key paths in a query, which is super awesome

```
[NSPredicate predicateWithFormat:@"department.name like %@", department];
[NSPredicate predicateWithFormat:@"ANY employees.salary > %f", salary];
```

NSPredicate Comparisons

- =, ==: the expression on the left is equal to the right-hand expression
- >=, =>: the left hand expression is greater than or equal to the right hand expression (and vice versa for <=. =<, and also <, >)
- !=, <>: the left hand expression is not equal to the right hand expression
- BETWEEN: the left hand expression is between, or equal to either of, the values specified in the right hand side. The right hand side is a two value array giving upper and lower bounds. Arrays denoted with {}

NSPredicate String Comparisons

- BEGINSWITH: the left-hand expression begins with the right-hand expression
- CONTAINS: the left-hand expression begins with the right-hand expression
- ENDSWITH: the left-hand expression ends with the right-hand expression
- LIKE: the left-hand expression equals the right hand expression: ? and * are allowed as wildcard characters, where ? matches 1 character and * matches 0 or more characters
- MATCHES: the left-hand expression equals the right-hand expression using regex-style comparisons.

NSPredicate Relational Operators

- ANY, SOME: Specifies any of the elements in the following expression
- ALL: Specifies all of the elements in the following expression
- NONE: Specifies none of the elements in the following expression
- IN: Equivalent to an SQL IN operation, the left-hand side just appear in the collection specified by the right-hand side.

NSPredicate Basic Compound Predicates

- AND, &&: Logical AND
- OR, ||: Logical OR
- NOT, !: Logical NOT

```
[NSPredicate predicateWithFormat: @“room.hotel.name == %@ AND
dateFrom <= %@ AND dateTo >= %@", @"Solid Stay",
self.startPicker.date, self.endPicker.date];
```

NSPredicate and self

- You will see the word self used in NSPredicates
- self refers to each entity we are querying against

```
[NSPredicate predicateWithFormat:@“self == %@“,someObject];
```

Demo

NSPredicate variable subsitution

- Variable substitution is supported too, using $ sign for variable names
- Cache predicates and perform substitutions at runtime, for better performance.

```
NSPredicate *predicate = [NSPredicate predicateWithFormat:@"id = $user"];
NSDictionary *substitutions = @{@"user": currentUser}

NSPredicate *filter = [predicate
predicateWithSubstitutionVariables:substitutions];
```

Searching Collections

- Collection classes can be searched and filtered using **`NSPredicate`***
- **`NSFetchRequest`** exposes a predicate property, for filtering entities

```
- (NSArray *)filteredArrayUsingPredicate:(NSPredicate *)predicate;
- (NSSet *)filteredSetUsingPredicate:(NSPredicate *)predicate;
```

*Most collection classes; NSDictionary and NSIndexSet don’t directly accept an NSPredicate

NSFetchRequest resultType

- NSFetchRequest has a property named resultType.
- By default it is set to NSManagedObjectResultType
- Here is all the types:
  - NSManagedObjectResultType: returns the managed objects
  - NSCountResultType: returns the count of all the objects that match the fetch
  - NSDictionaryResultType: This returns the results back in a dictionary
  - NSManagedObjectIDResultType: Returns the ObjectIDs instead of full-fledged managed objects

Fetching the count

- NSCountResultType lets you get back the count of objects that a fetch will retrieve.
- It returns a an array containing an NSNumber, which is the count.
- Its a little weird, but it works!

Demo