PG5600
iOS programmering

Forelesning 9 - Mer om MVC, persistering og testing

Last ned repoet for denne forelesningen:

https://github.com/haaakon/Demo-Students/

Vi ser på dette gjennom hele forelesningen

Sist gang

- Hvor filer lagres
- Enkel lesing og skriving til disk
- NSUserDefaults
- NSKeyedArchiver / NSKeyedUnarchiver
- Core Data
- Keychain

I dag

- Custom Views og MVC
- Protokoller og protcol extension
- Tips til å skrive tester
- Skrive tester for Persistering
- Skrive tester for JSON-parsing

Hvordan teste at data vises på riktig måte?

[Demo av viewet vi skal lage]

Lag datasource for viewet

Dette vil gjøre det enklere å beholde MVC-patternet

```
@objc
protocol StudentSummaryViewDataSource {
    func numberOfStudentsInStudentSummaryView(studentSummaryView: StudentSummaryView) -> Int
}


class StudentSummaryView : UIView {

     @IBOutlet weak var numberOfStudentsLabel : UILabel!

     weak var dataSource : StudentSummaryViewDataSource?



}
```

Inspirert av Apple

Fra UITableView i UIKit:

```
public protocol UITableViewDataSource : NSObjectProtocol {

    optional public func numberOfSectionsInTableView(tableView: UITableView) -> Int

    weak public var dataSource: UITableViewDataSource?

    public func tableView(tableView: UITableView, cellForRowAtIndexPath indexPath: NSIndexPath) -> UITableViewCell

    ...

    }
```

Vise data i viewet:

```
func reloadData() {
      if let numberOfStudents = dataSource?.numberOfStudentsInStudentSummaryView(self) {
          numberOfStudentsLabel.text = "\(numberOfStudents) studenter"
      } else {
          numberOfStudentsLabel.text = "?"
      }
  }
```

Hvem skal være dataSource?

- MVC -> Controller er mellommann mellom Model og View
- Men i iOS blir ofte ViewController mellommann for alt for mye, og er vanskelig å skrive tester på.
- Vi lager en egen klasse som kun er controller for vårt custom View!

DataSourceController

```
class StudentSummaryViewDataSourceController : StudentSummaryViewDataSource {

    @objc func numberOfStudentsInStudentSummaryView(studentSummaryView: StudentSummaryView) -> Int {
        // TODO: tell opp antall studenter i databasen
        return 0
    }
}
```

Vi må hente alle Student-objekter i databasen og telle disse

Protcol

```
protocol Fetchable {
    static var entityName : String { get }

    static func allObjects(inManagedObjectContext managedObjectContext: NSManagedObjectContext) -> [Self]

}
```

Self = klassen som implementerer protokollen, meget nyttig!

Protocol extensionen

```
extension Fetchable where Self : NSManagedObject {

    static func allObjects(inManagedObjectContext managedObjectContext: NSManagedObjectContext) -> [Self] {
        let fetchRequest = NSFetchRequest(entityName: entityName)
        do {
            let results = try managedObjectContext.executeFetchRequest(fetchRequest)
            return results as! [Self]
        } catch {
            print("An error occurred")
            return [Self]()
        }
    }
}
```

Implementasjonen

Kun sette final og implementere entityName så har du allObjects!

```
final class Student: NSManagedObject, Fetchable {

    static var entityName = "Student"

}


let students = Student.allObjects(inManagedObjectContext: moc)
```

Vi lager en test for å finne om det fungerte

```
func testCreate2Students() {
        let student1 = Student.insertStudentWithName("Erik", inManagedObjectContext: managedObjectContext)

        let student2 = Student.insertStudentWithName("Magnus", inManagedObjectContext: managedObjectContext)

        ModelManager.sharedManager.saveContext()

        let fetchedStudents = Student.allObjects(inManagedObjectContext: managedObjectContext)
        XCTAssertEqual(fetchedStudents.count, 2)
    }
```

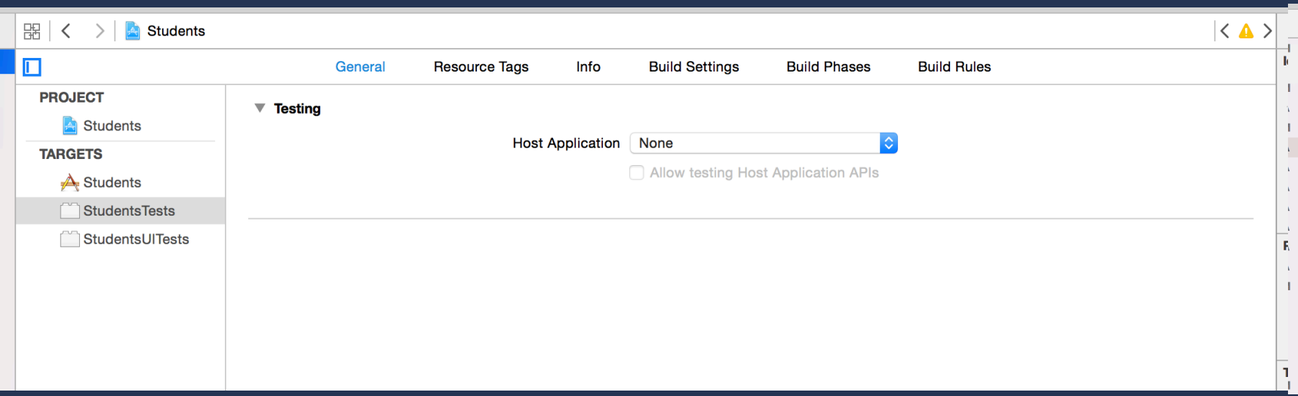
Noen gotchas

Husk å slette databasen mellom hver test!

```
override func setUp() {
        super.setUp()
        let stud = Student.allObjects(inManagedObjectContext: managedObjectContext)


        for student in stud {
            managedObjectContext.deleteObject(student)
        }

    }
```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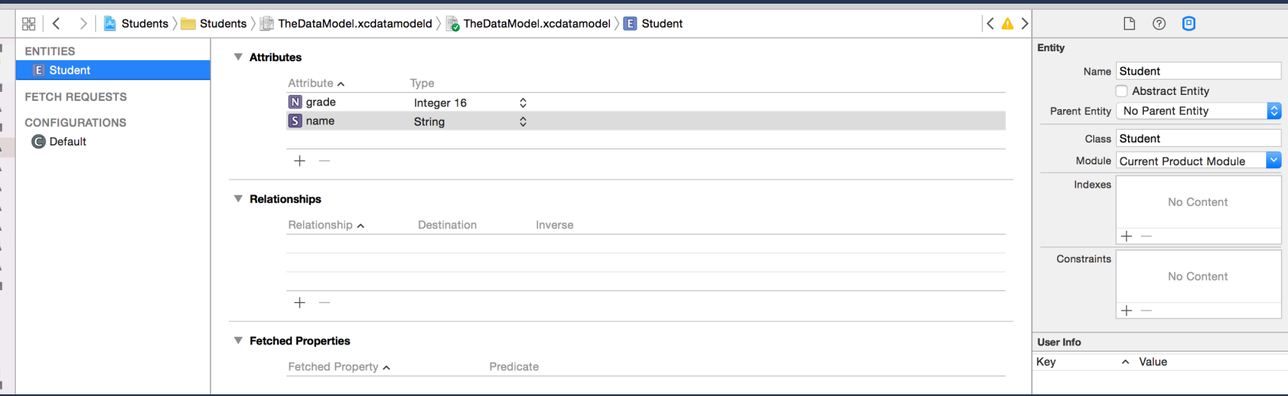
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Parent Entity
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No Content
Constraints
No Content
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Value

Vi skriver en test på at datasource leverer det vi forventer

```
func testSummaryOf2Students() {

        mockInsertStudents(["Per", "Kristina"])

        let studentSummaryViewDataSourceController = StudentSummaryViewDataSourceController()

        let numberOfStudentsShown = studentSummaryViewDataSourceController.numberOfStudentsInStudentSummaryView(StudentSummaryView())

        XCTAssertEqual(numberOfStudentsShown, 2)

    }
```

Implementer datasource

```
@objc func numberOfStudentsInStudentSummaryView(studentSummaryView: StudentSummaryView) -> Int {
        let allStudents = Student.allObjects(inManagedObjectContext: ModelManager.sharedManager.managedObjectContext)
        return allStudents.count
    }
```

Vi ser litt i prosjektet

- Neste steg er å hente Student fra api i json data

```
func testCreateStudentFromJSON () {
        let wantedName = "Marie Curie"
        let wantedGrade = 5
        let jsonAttributes = StudentsTests.jsonDictionaryFromFile("1Student")

        let student = Student(attributes: jsonAttributes)
        ModelManager.sharedManager.saveContext()

        XCTAssertNotNil(student)

        XCTAssertEqual(student?.name, wantedName)
        XCTAssertEqual(student?.grade, wantedGrade)

        let fetchedStudent = Student.allObjects(inManagedObjectContext: managedObjectContext).first!

        XCTAssertEqual(fetchedStudent.name, wantedName)
        XCTAssertEqual(fetchedStudent.grade, wantedGrade)

    }
```

Negativ test - nil-initializer

```
func testShouldNotCreateStudent() {
        let jsonAttributes = StudentsTests.jsonDictionaryFromFile("1FalseStudent")

        let student = Student(attributes: jsonAttributes)
        ModelManager.sharedManager.saveContext()

        XCTAssertNil(student)

    }
```

Oppsummering

- Vi har automatiserte tester for alle steder i appen vår hvor brukeren kan få vist data
- Vi har spart oss fremtidig tid ved å skrive en protocol extension med default implementation
- Vi har har tester på at APIet vi har fått beskrevet gjør at appen vil oppføre som vi forventer

Oppgaver ligger på IT's learning