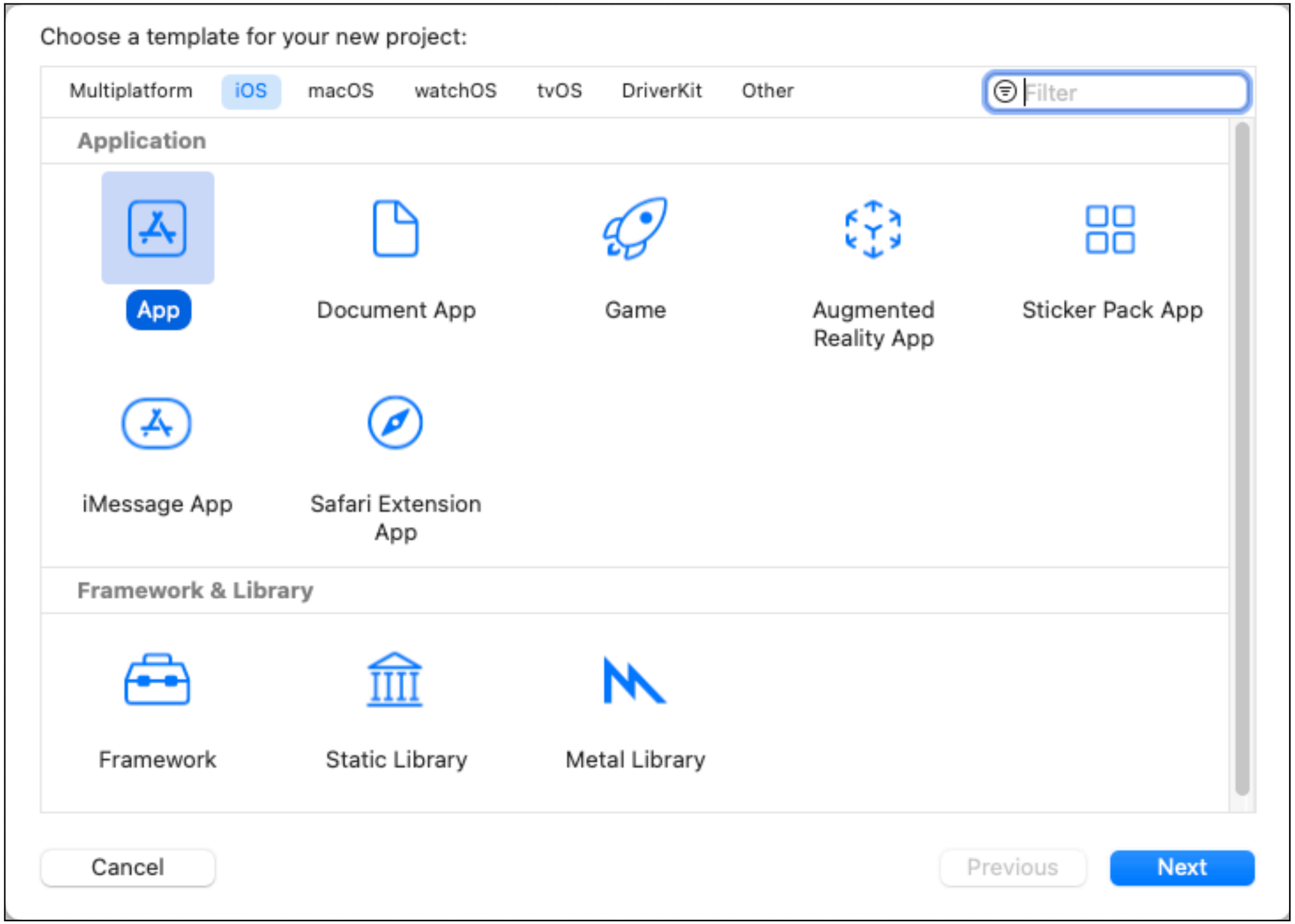
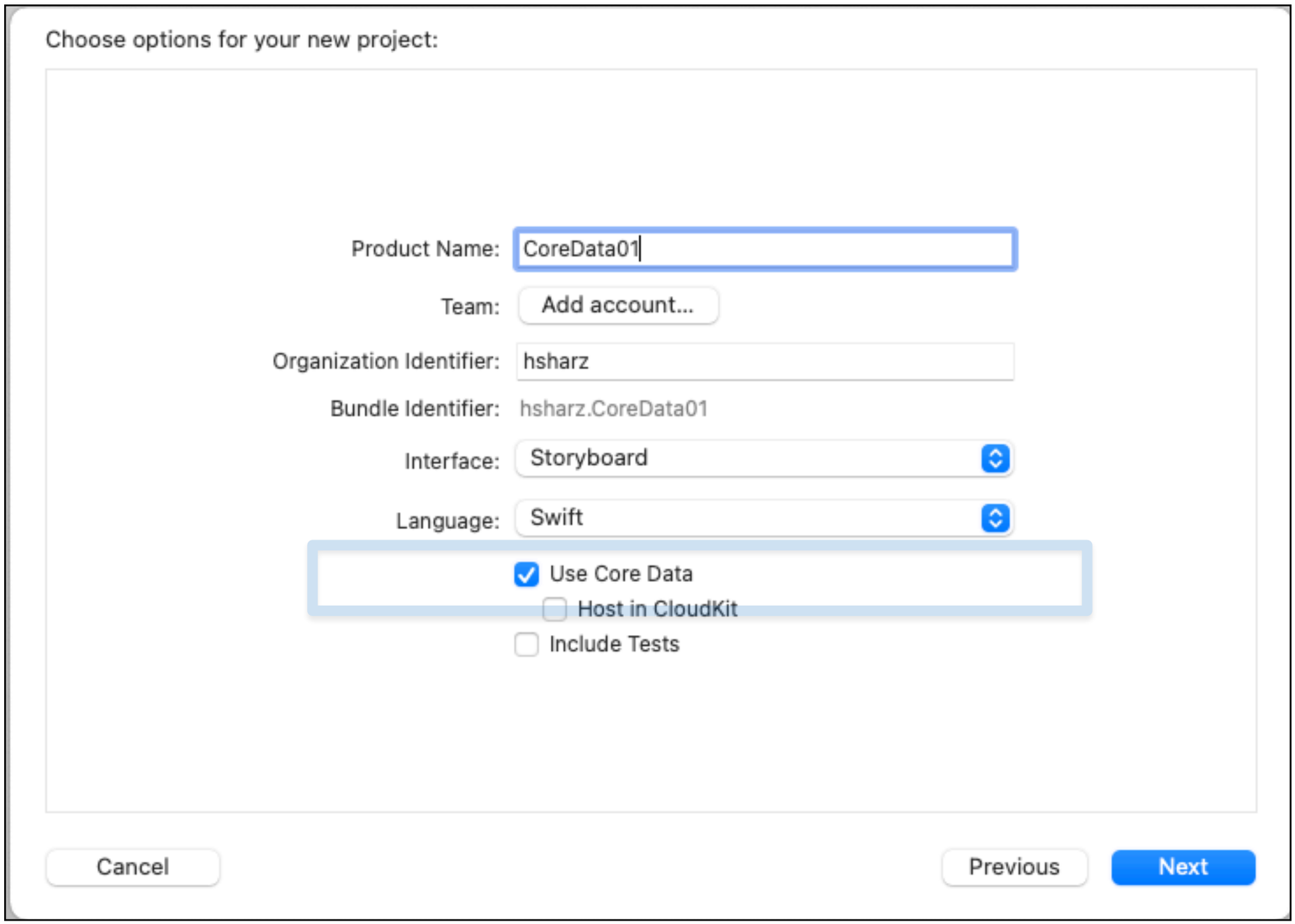
CoreData: iOS mit Datenbanken

- TabbedBar mit
  - Einfügen eines Datensatzes
  - Anzeigen in einemEditor
  - Anzeigen in einer Liste
  - SQL-Konsole
  - Ändern eines Datensatzes
  - Löschen eines Datensatzes

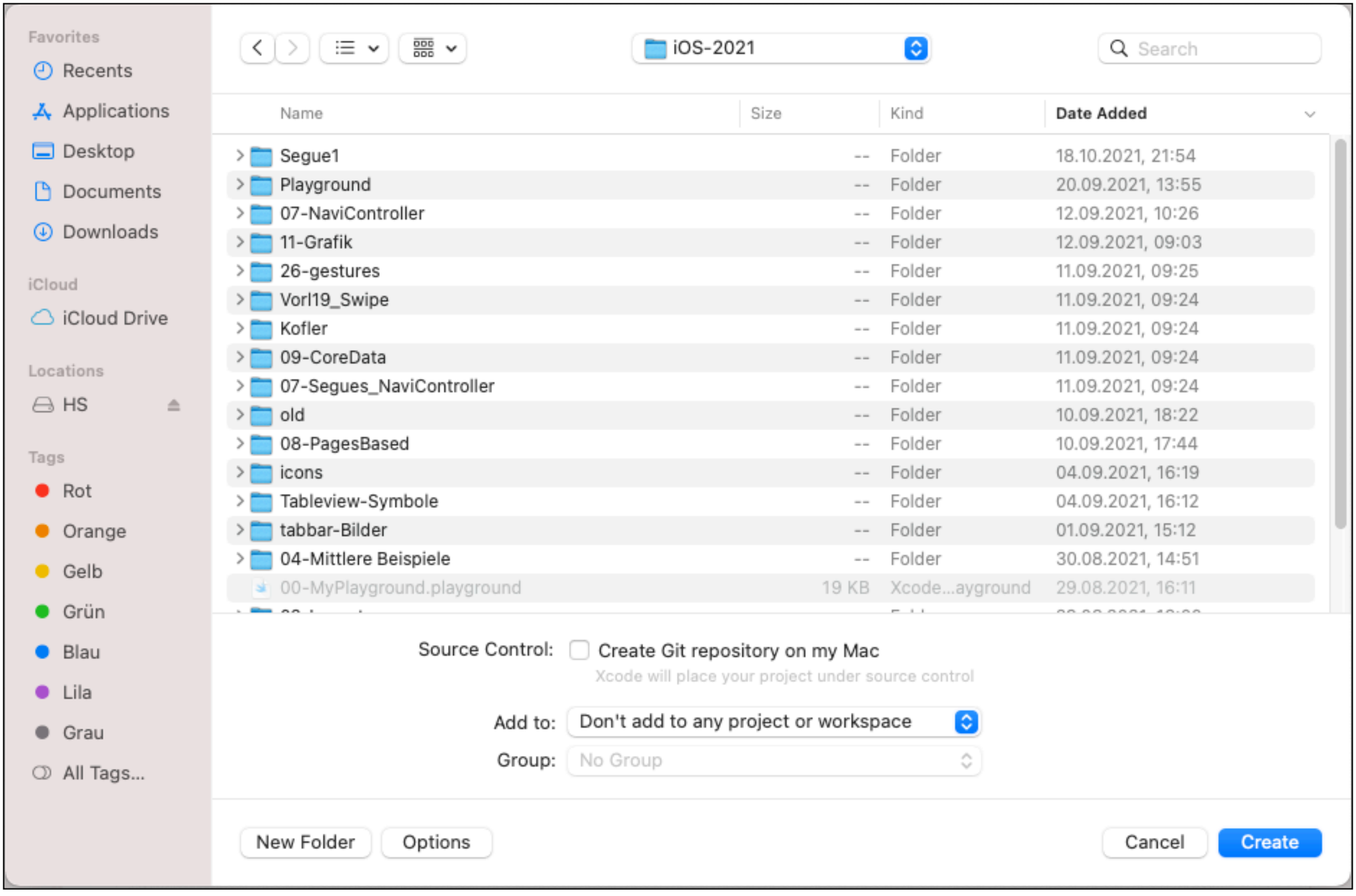
Single View App



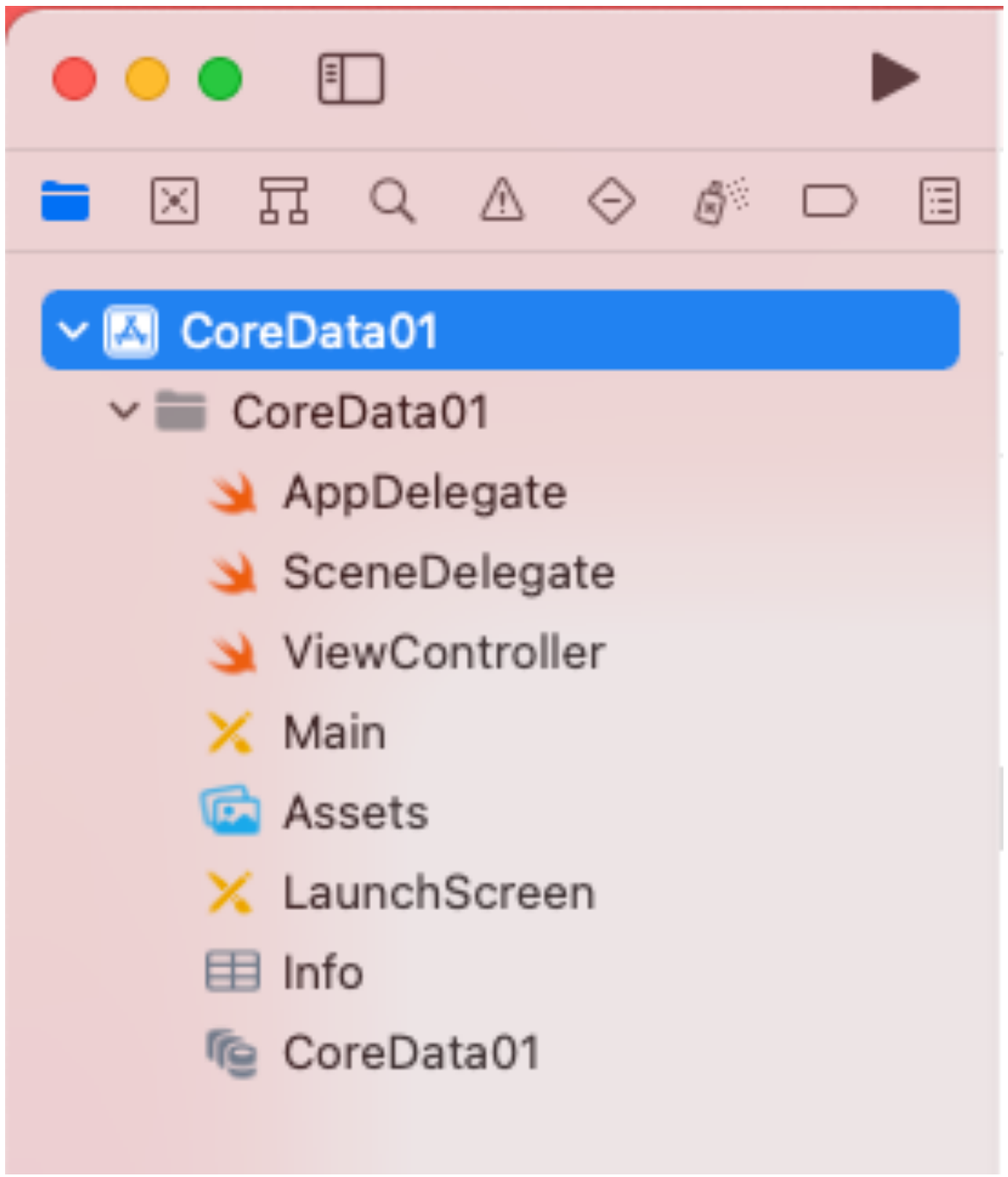
Name der App, mit CoreData Option



Speichern im Ordner



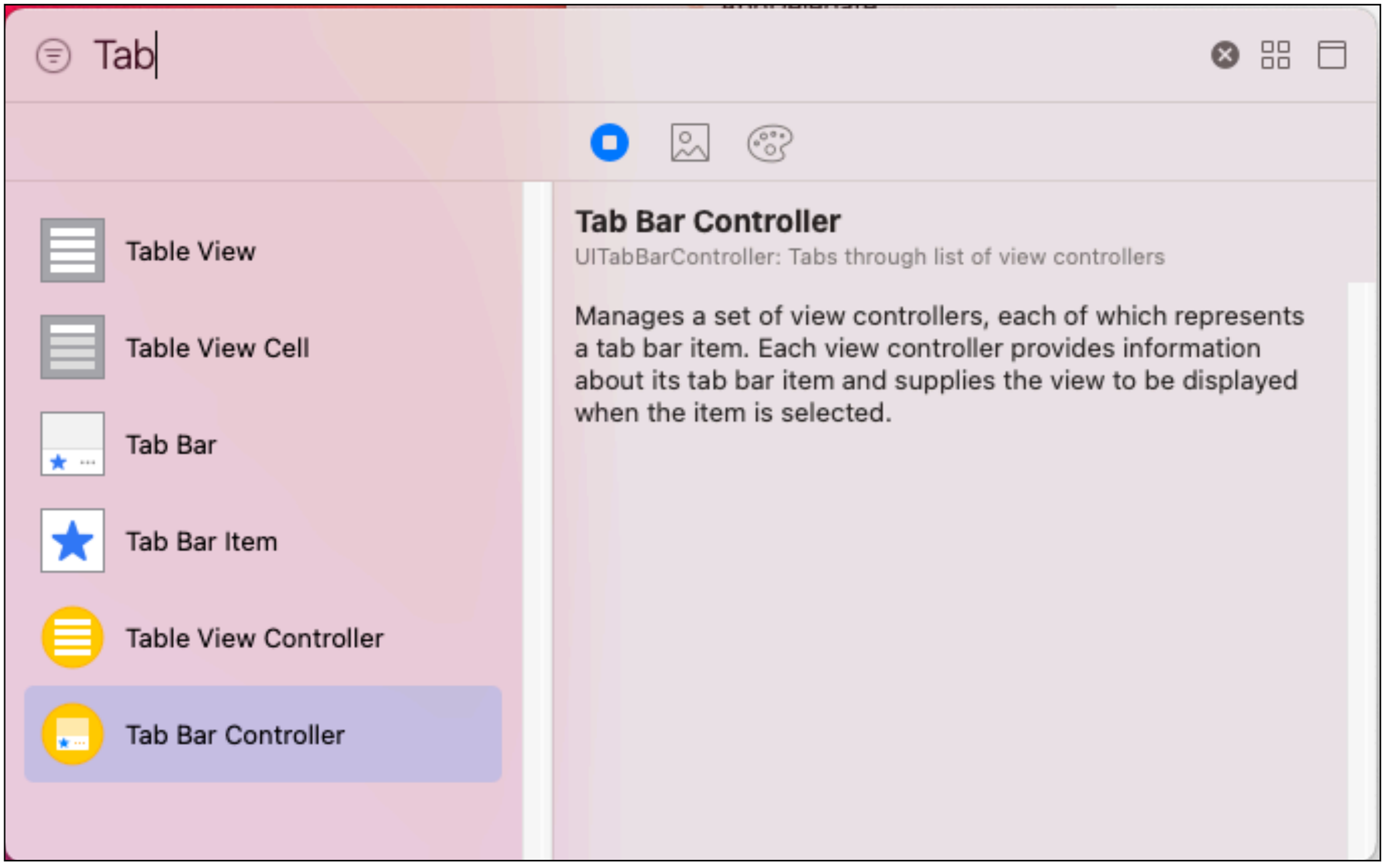
Anzeige der Projektstruktur



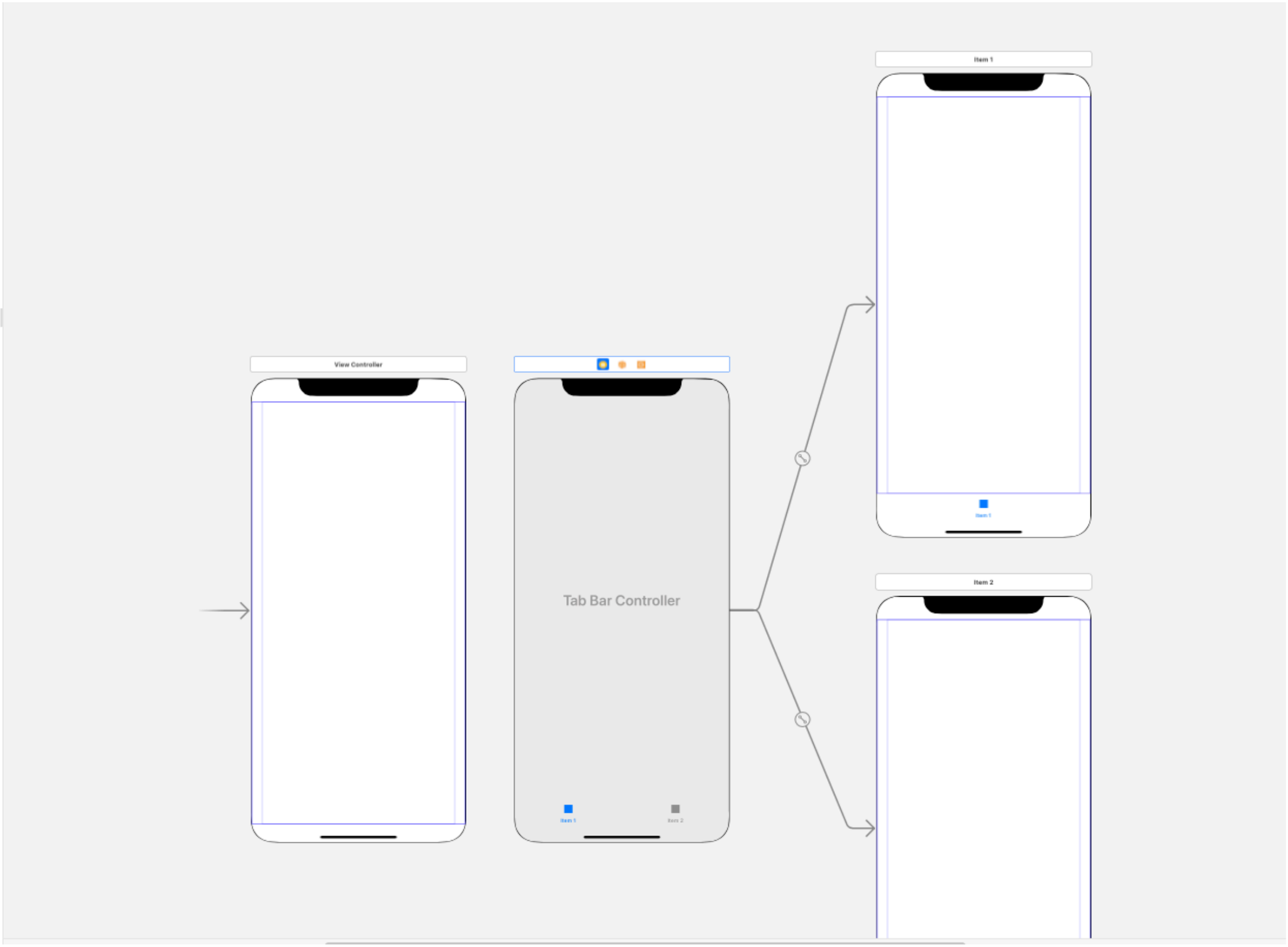
NEU

Einfügen eines Tabbar-Controllers

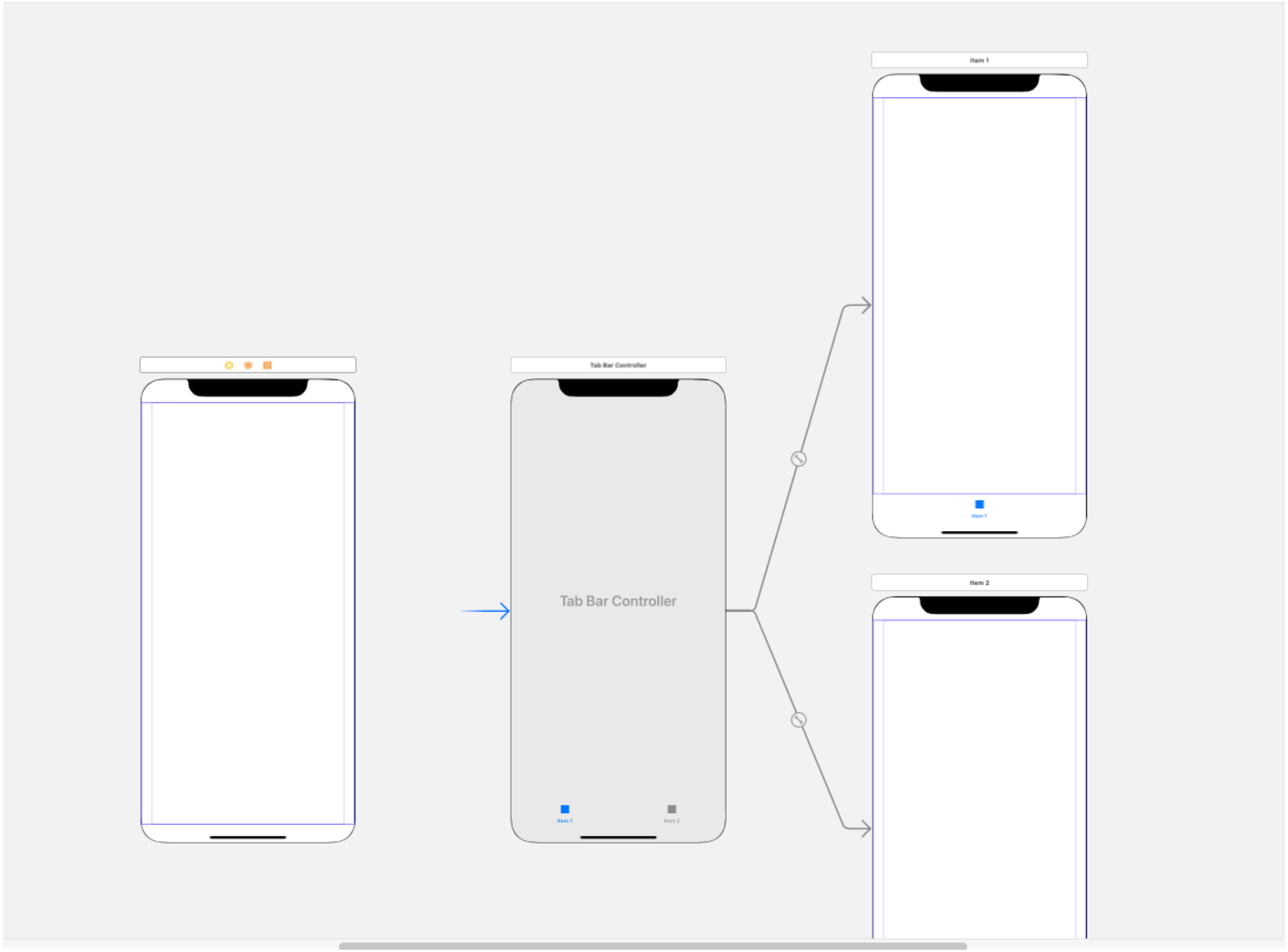
Oder Embedded TabBar Controller



Tabbar-Controllers im Projekt



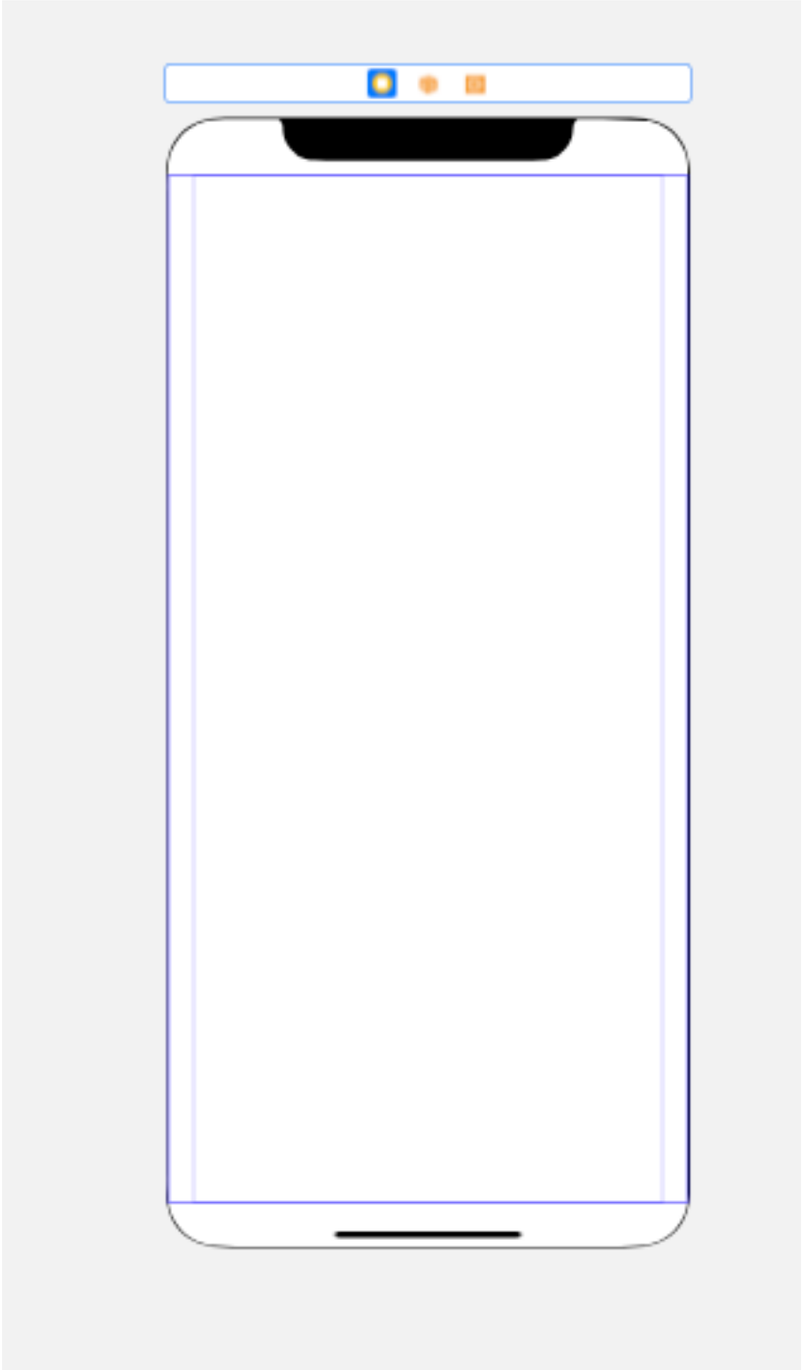
Verschieben des „StartPfeils“



Löschen des ersten ViewControllers

1) Anklicken links oben

2) Löschen mit Taste Entf

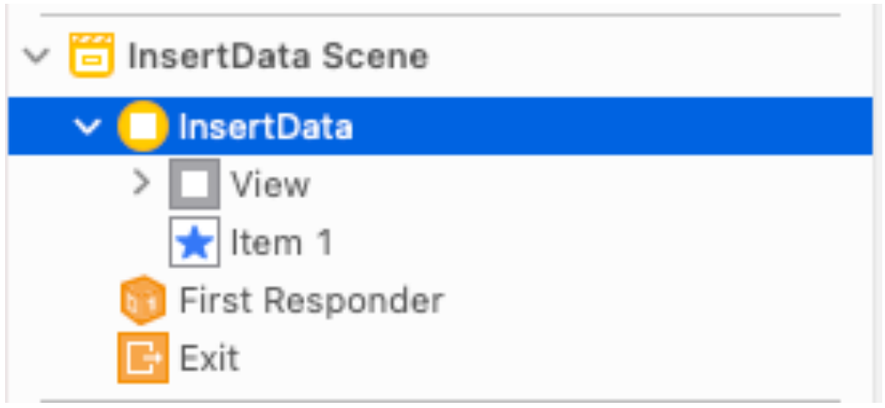


Umbenennen der beiden Tab’s

Caption der ViewController

1. „Item 1“ in. InsertData

2. „Item 2“ in „ShowDataEditor“

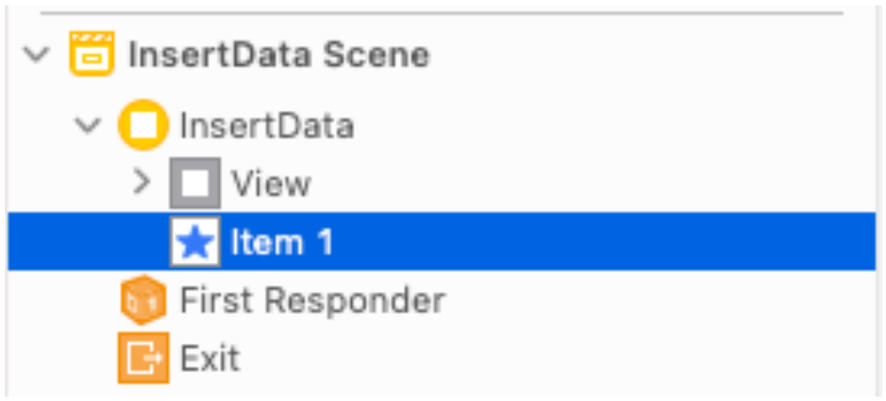


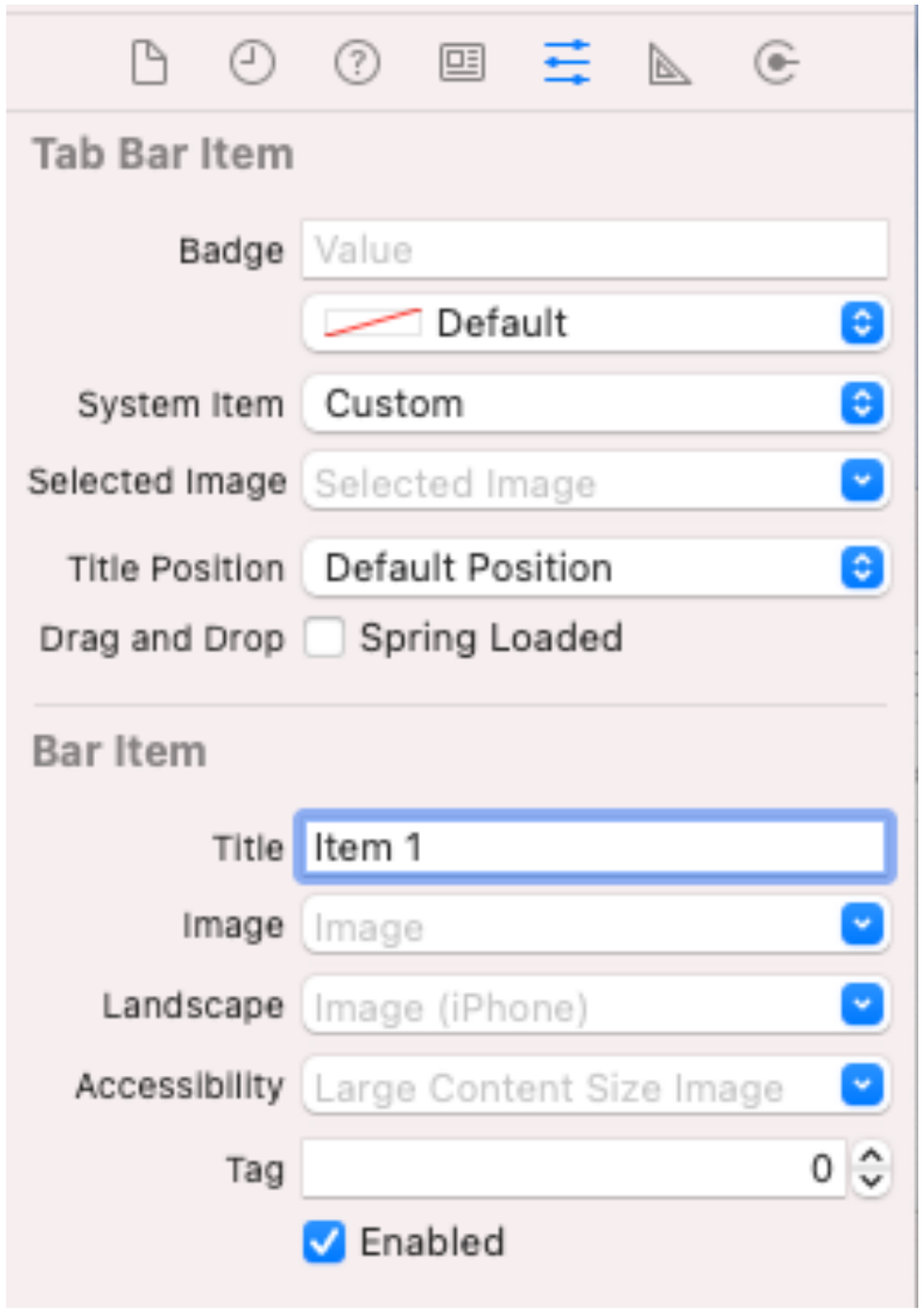
Umbenennen der beiden Titel

Caption der Tabbar-Items

1. „Item 1“ in. InsertData

2. „Item 2“ in „ShowDataEditor“





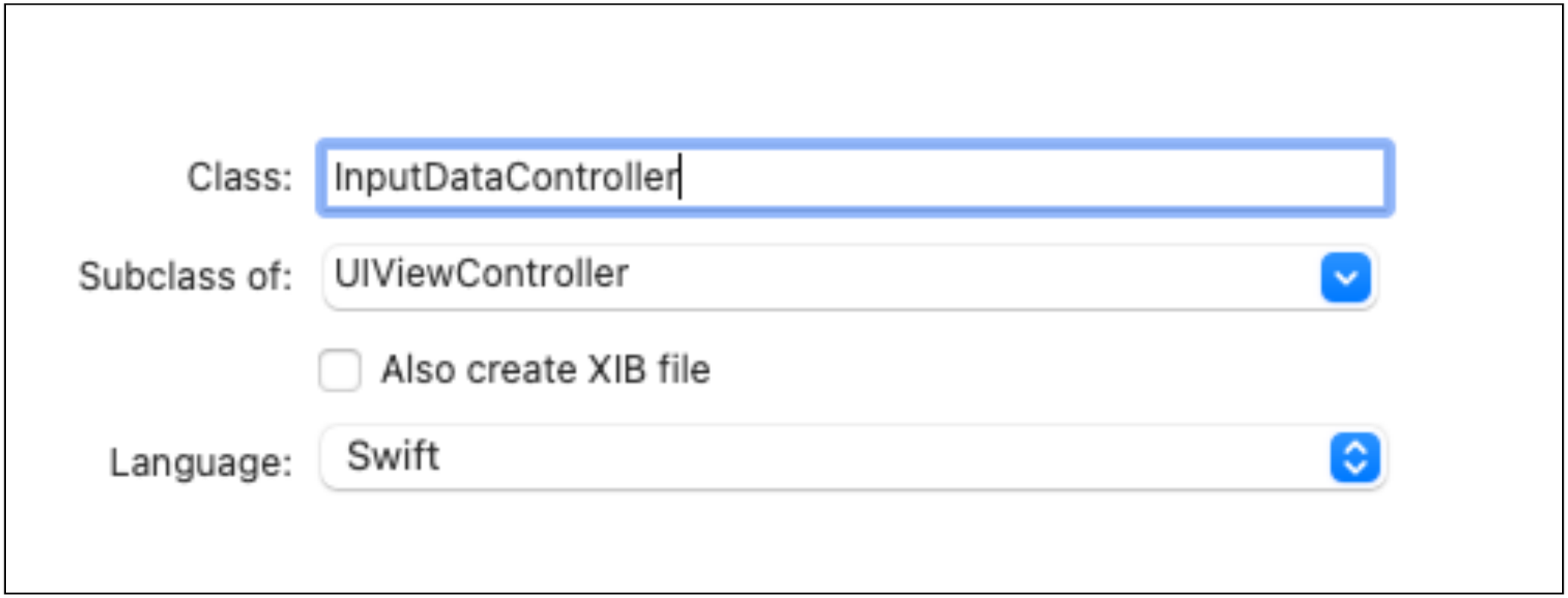
CoreData1: UI-Elemente

- Label caption (T10, L10,R10)
- Label firstname (T30, L20)
- tfirstname (T23,L75,R40)
- Label lastname (T50, L20)
- tlastname (T37,L60,R40)
- Label empno (T50, L20)
- tempno (T37,L33.5,R40)
- Label department (T50, L20)
- tdepartment (T37,L50,R40)
- Hori-Stack (T90, L10, R10)
  - Button Fontsize: 20, Einfügen
  - Button Fontsize 20, Dummydaten

Anlegen ViewController.swift für den 1. ViewController

ViewController.swift für InsertData

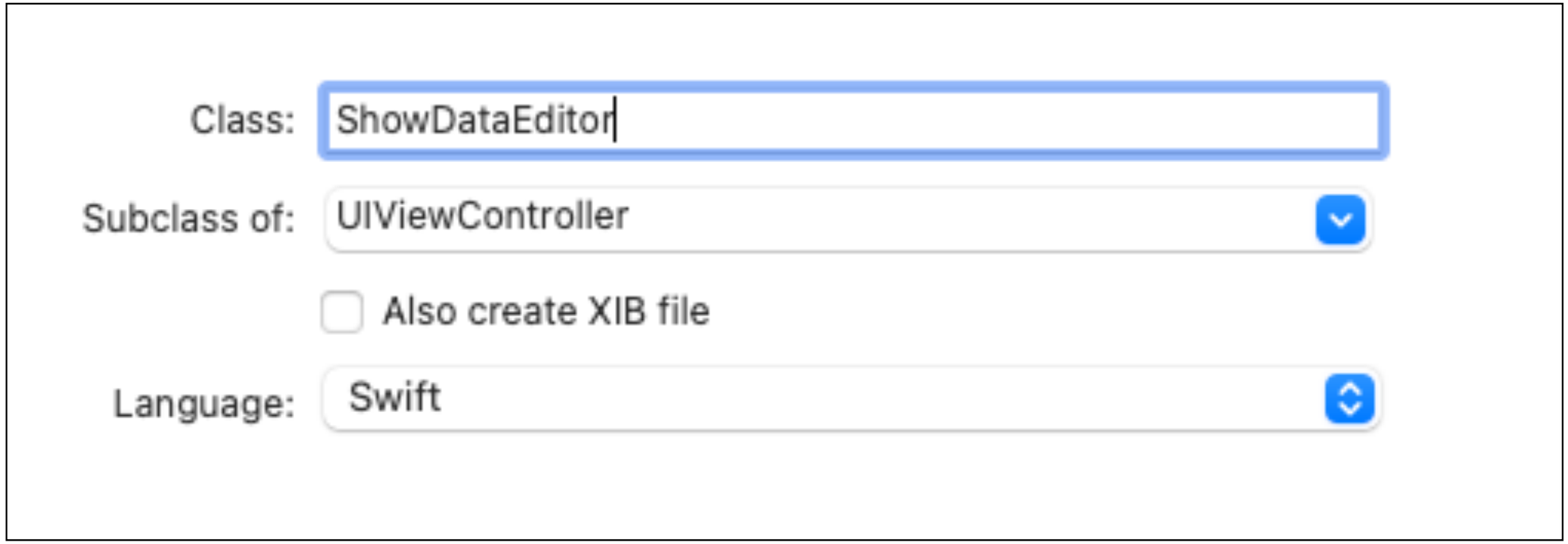
- Cmd N
- Cocoa Touch Class
- Class (Name): InputDataController
- SubClass: UIViewController



Anlegen ViewController.swift für den 2. ViewController

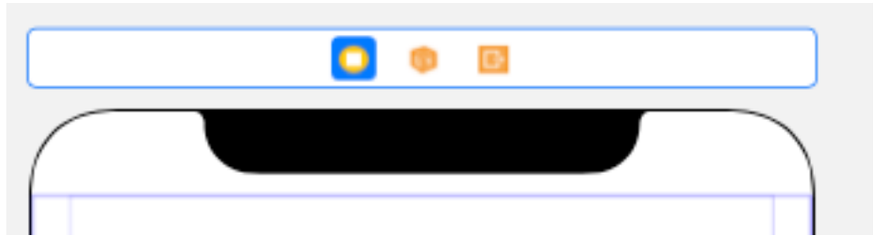
ViewController.swift für ShowDataEditor

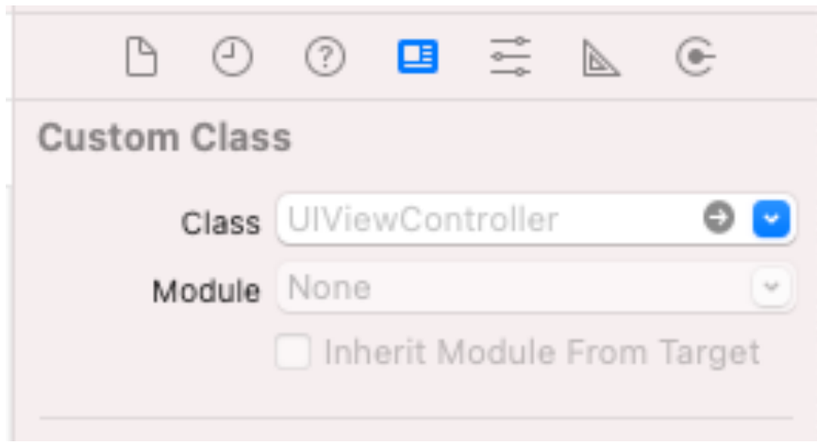
- Cmd N
- Cocoa Touch Class
- Class (Name): ShowDataEditor
- SubClass: UIViewController

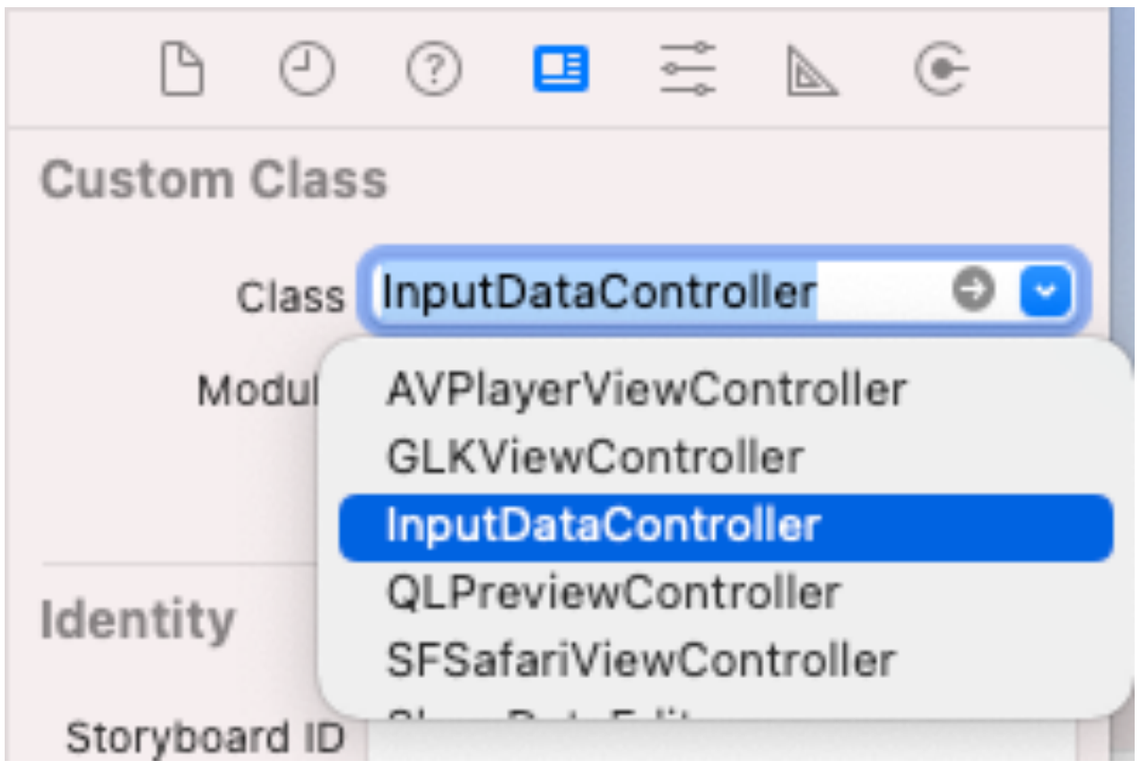


Zuweisen der swift-Datei zum 1. Controller

1. Anklicken des linken Punkt im 1. Controller
2. Anklicken des mittleren Schalters im rechten Property-Fenster
3. Suchen der Swift-Datei in der ComboBox Liste)

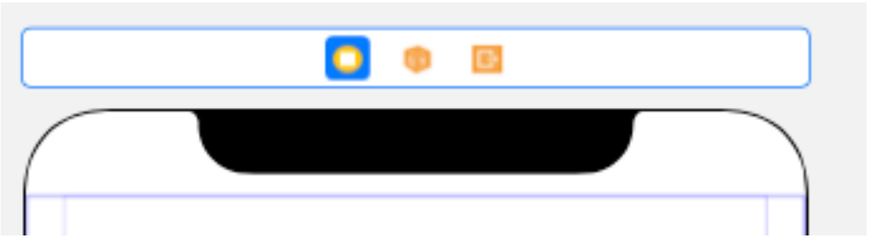


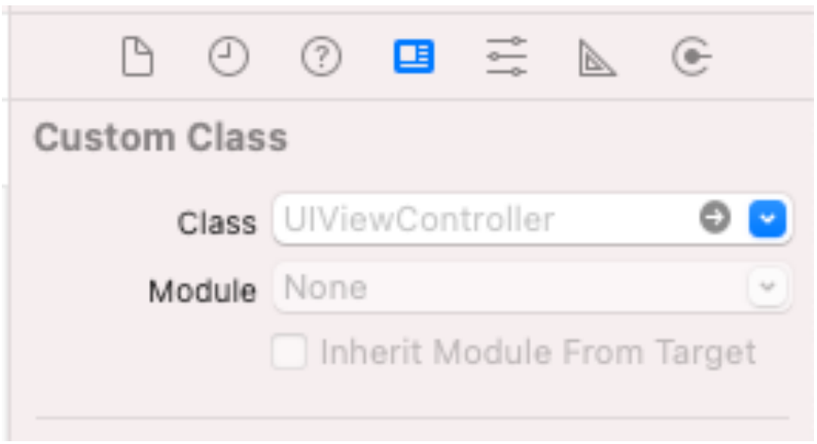


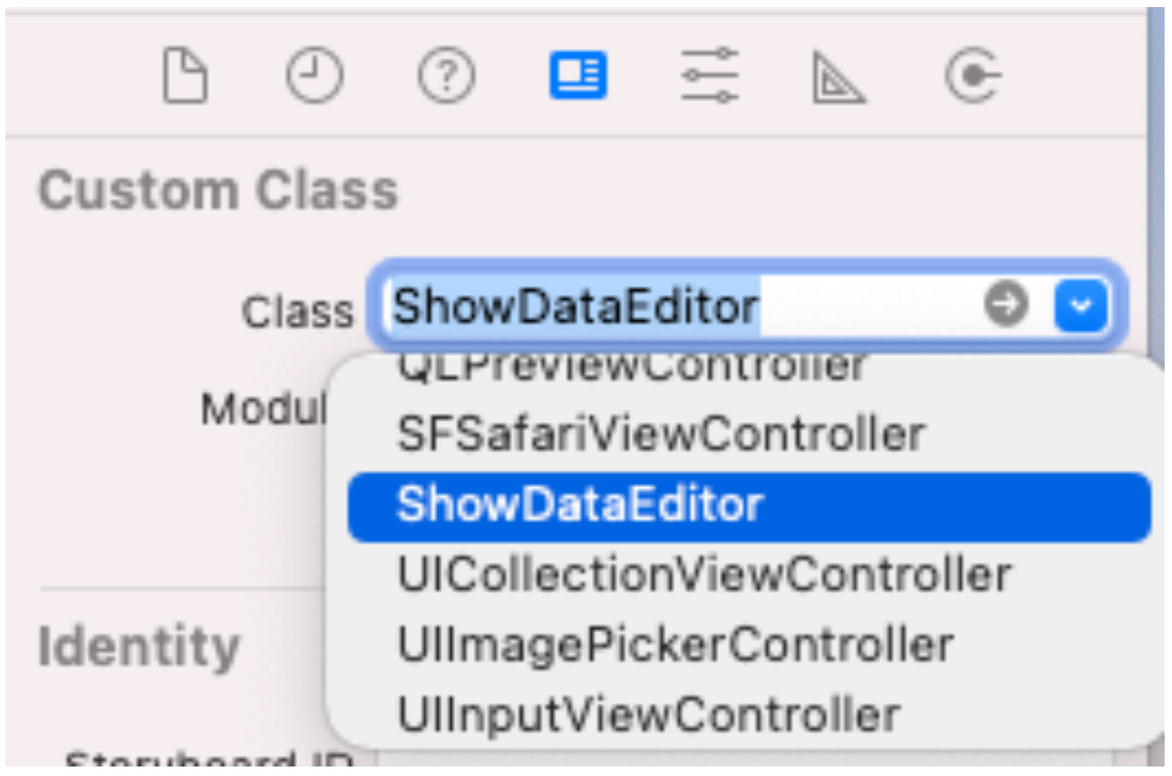


Zuweisen der swift-Datei zum 2. Controller

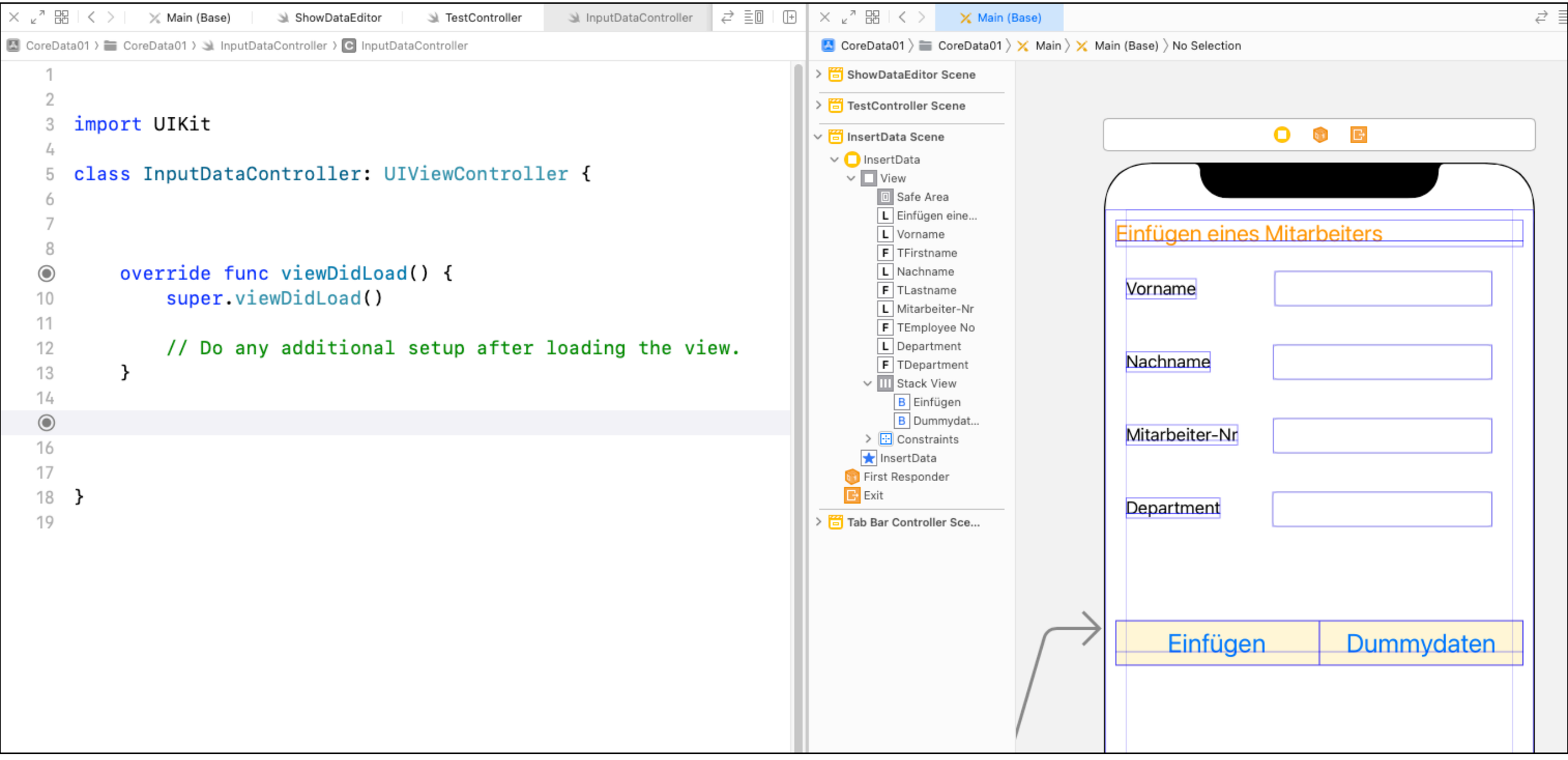
1. Anklicken des linken Punkt im 1. Controller
2. Anklicken des mittleren Schalters im rechten Property-Fenster
3. Suchen der Swift-Datei in der ComboBox Liste)







Referenzen und Events beim 1. Controller



Referenzen und Events

Main (Base) | ShowDataEditor | TestController | InputDataController | Main (Bas

CoreData01 〉 CoreData01 〉 InputDataController 〉 InputDataController

```
1
2
3   import UIKit
4
5   class InputDataController: UIViewController {
6
7       @IBOutlet var tFirstname: UITextField!
8       @IBOutlet var tLastname: UITextField!
9       @IBOutlet var tEmployeeNo: UITextField!
10      @IBOutlet var tDepartment: UITextField!
11
12
13      override func viewDidLoad() {
14          super.viewDidLoad()
15
16          // Do any additional setup after loading the view.
17      }
18
19      @IBAction func bnInsertDummyDataClick(_ sender: Any) {
20      }
21
22      @IBAction func bnInsertDataClick(_ sender: UIButton) {
23
24
25      }  // bnInsertDataClick
26
27
```

CoreData

1. Erstellen der Datenbank
    - Tabelle „Employee“
    - Tabelle „DBVersion“
2. Erstellen der Wrapperklassen
3. Datei DBQueries
    - Implementieren der DB-Methoden
        A. Insert-, Delete-, getEmployee
        B. getDBVersion
4. .

App

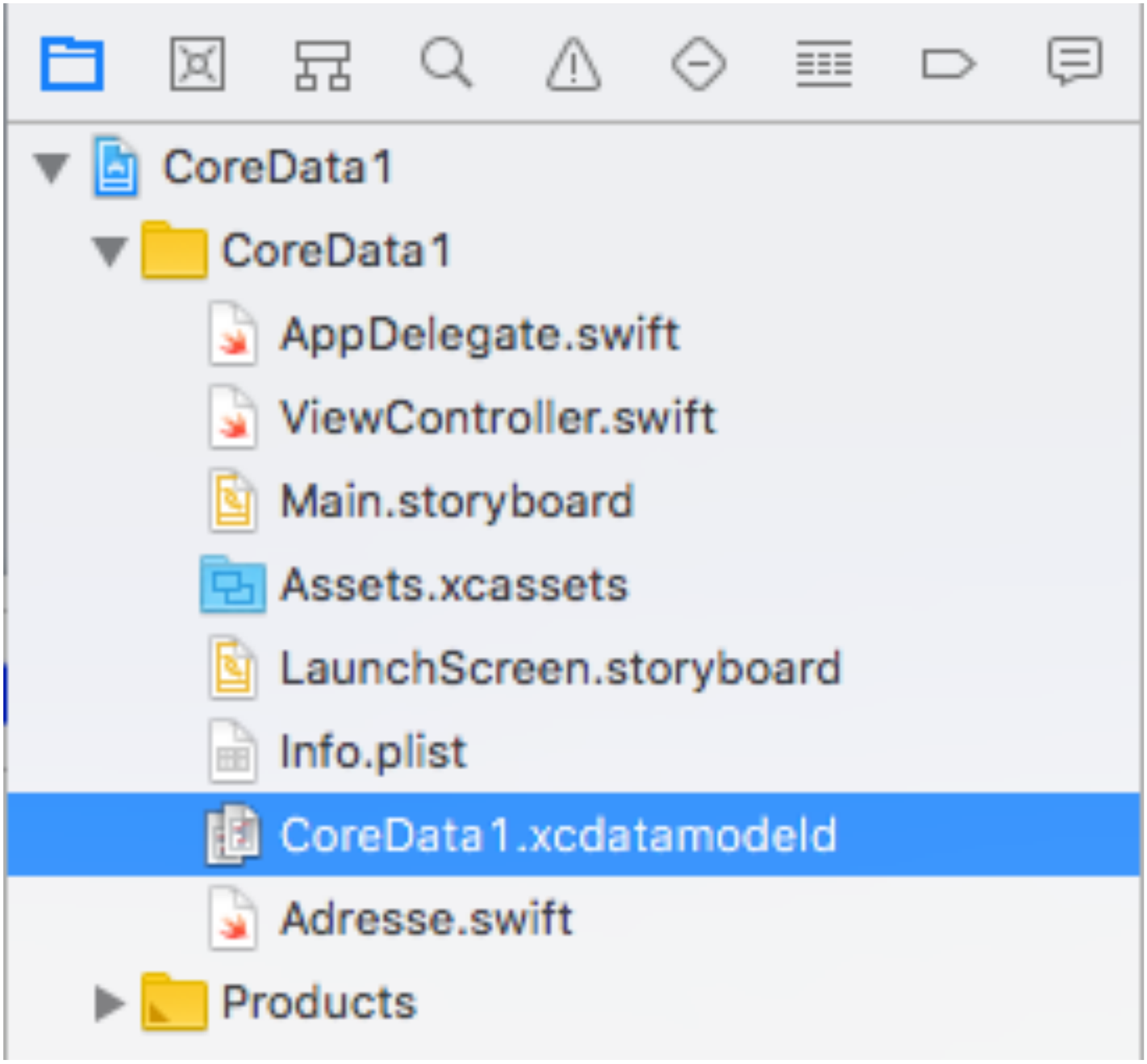
Objekte

Managed Object Context

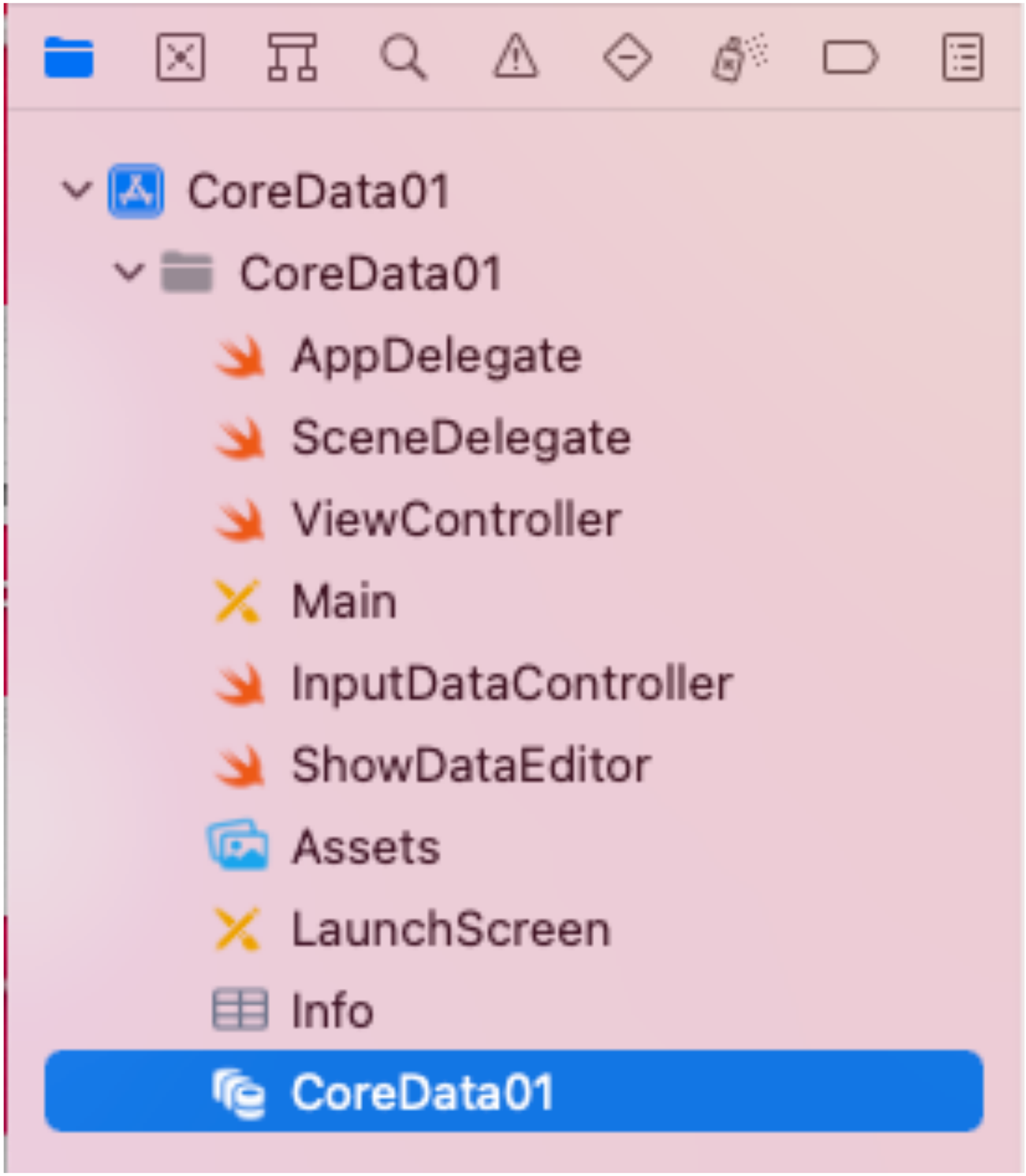
Binärdaten

Core Data Persistent Container

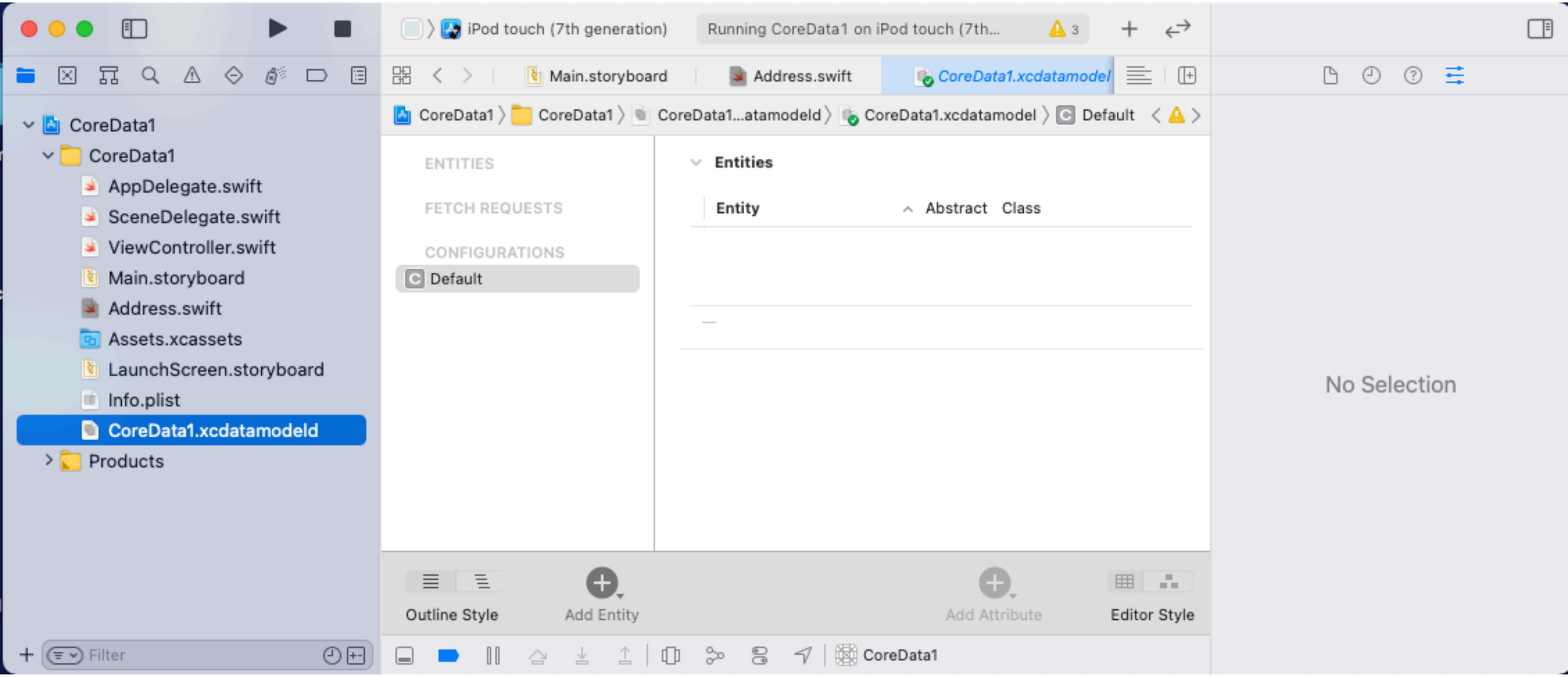
CoreData1:Datenbankmodell



CoreData1:Datenbankmodell



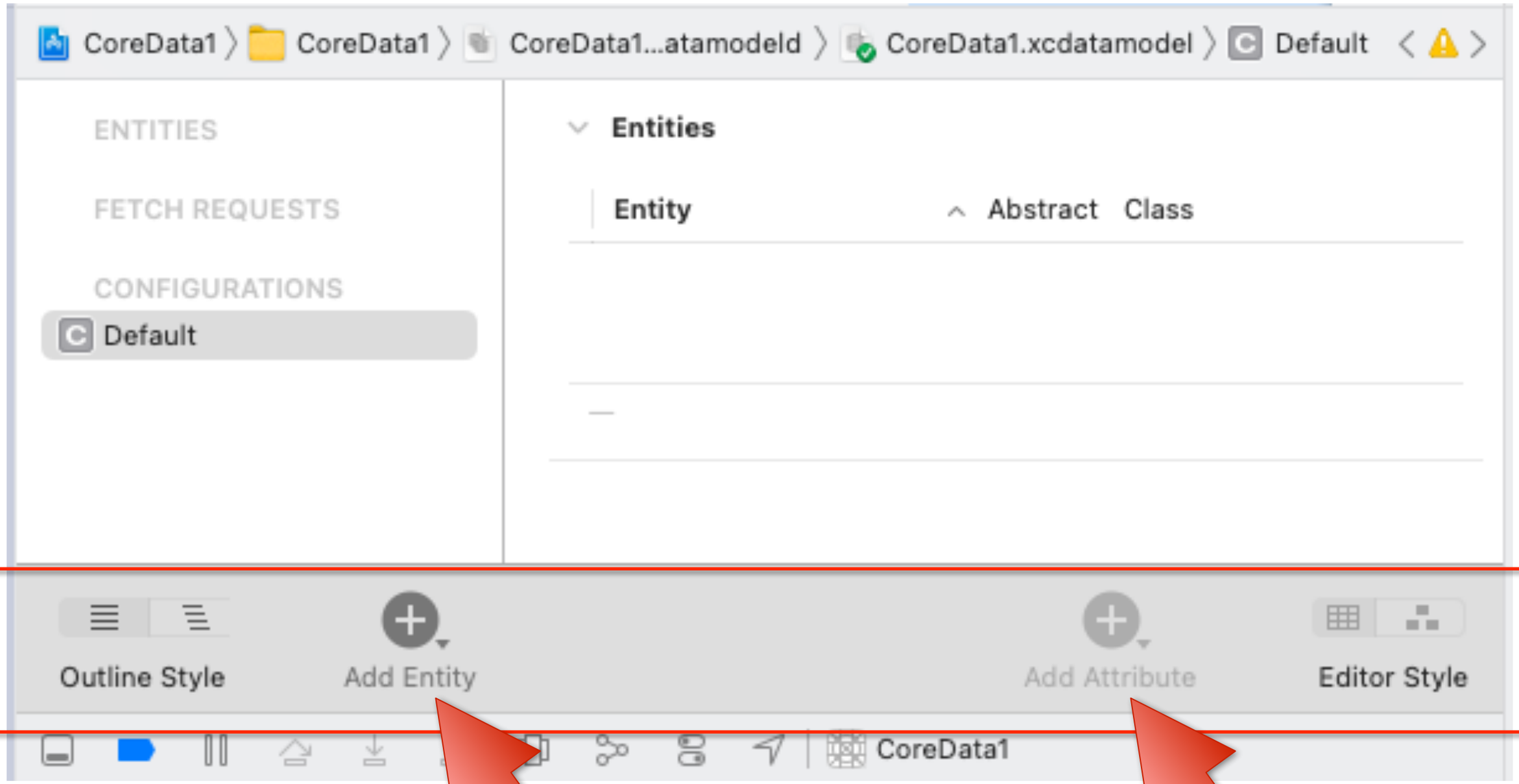
CoreData1 :Datenbankmodell



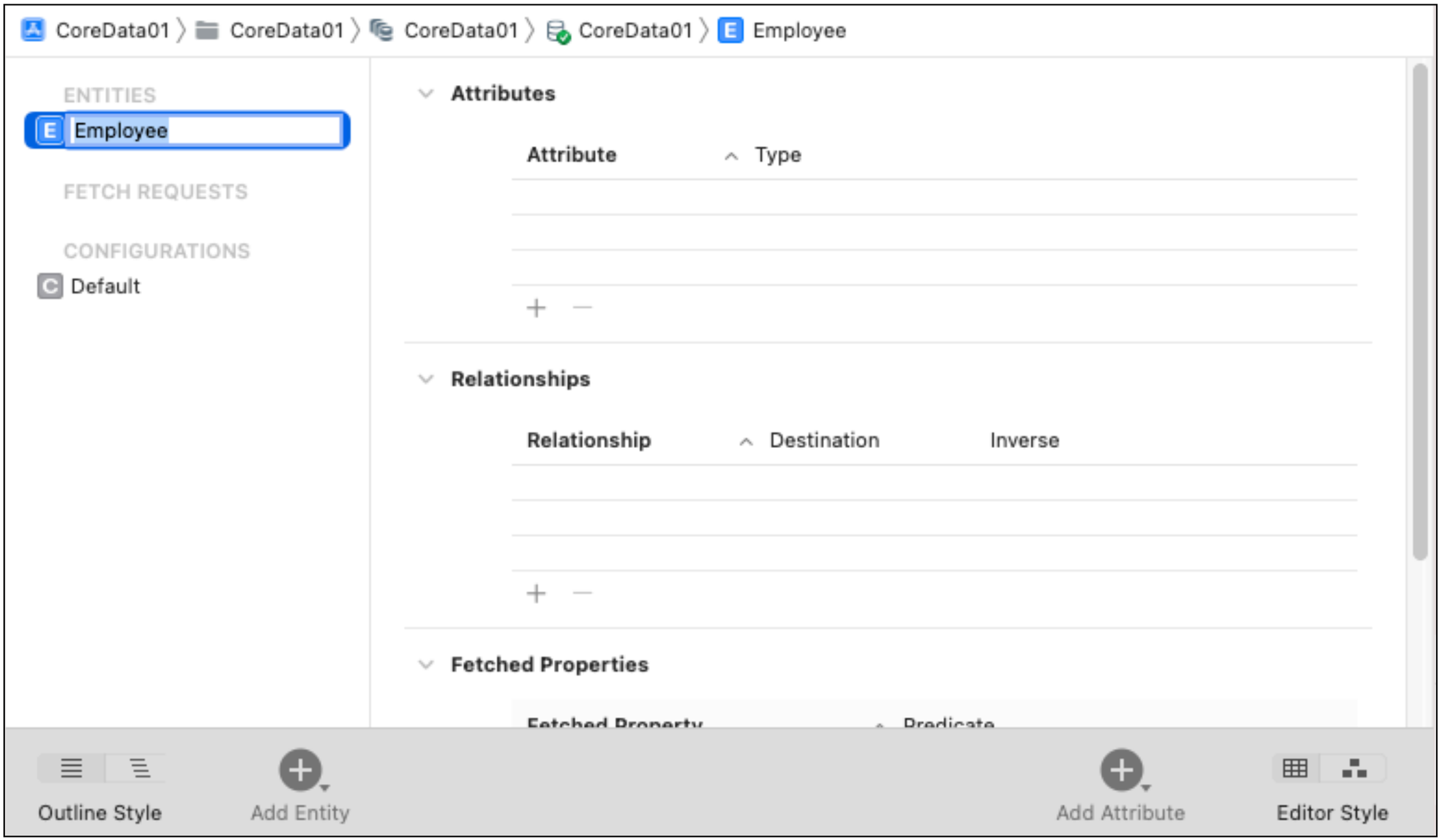
Untere Leiste:

- Add Entity
- Add Attribute

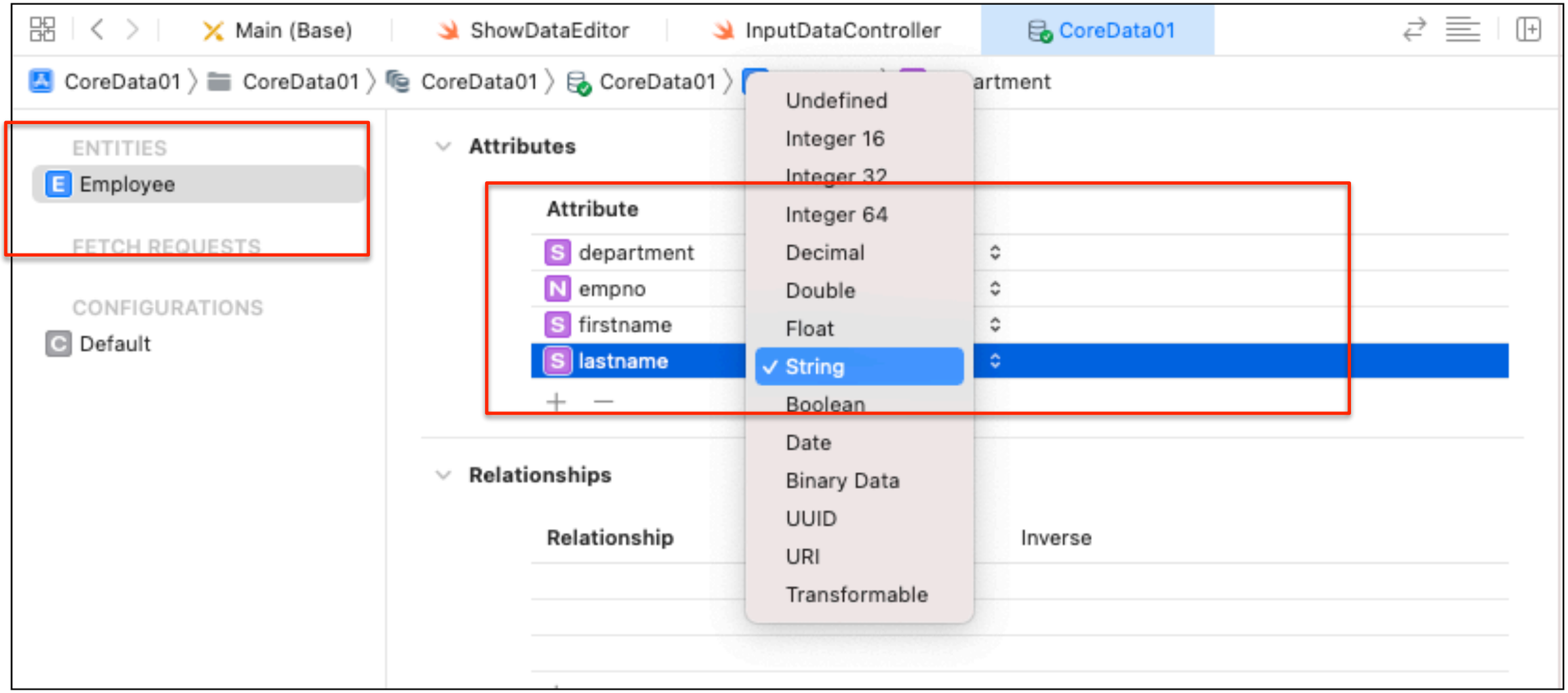
CoreData1:Datenbankmodell



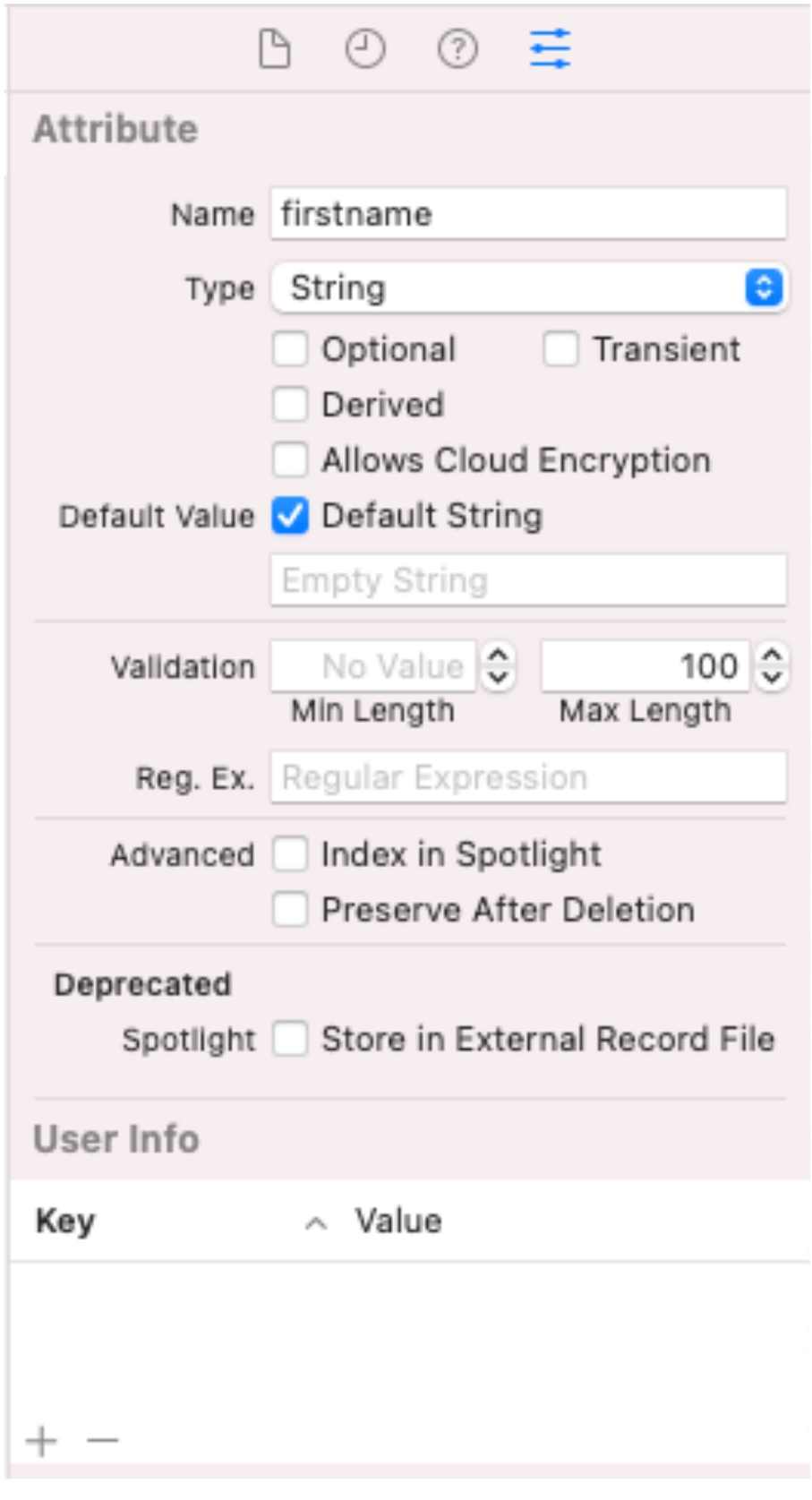
CoreData1:Datenbankmodell: Table „Employee“



CoreData1:Datenbankmodell



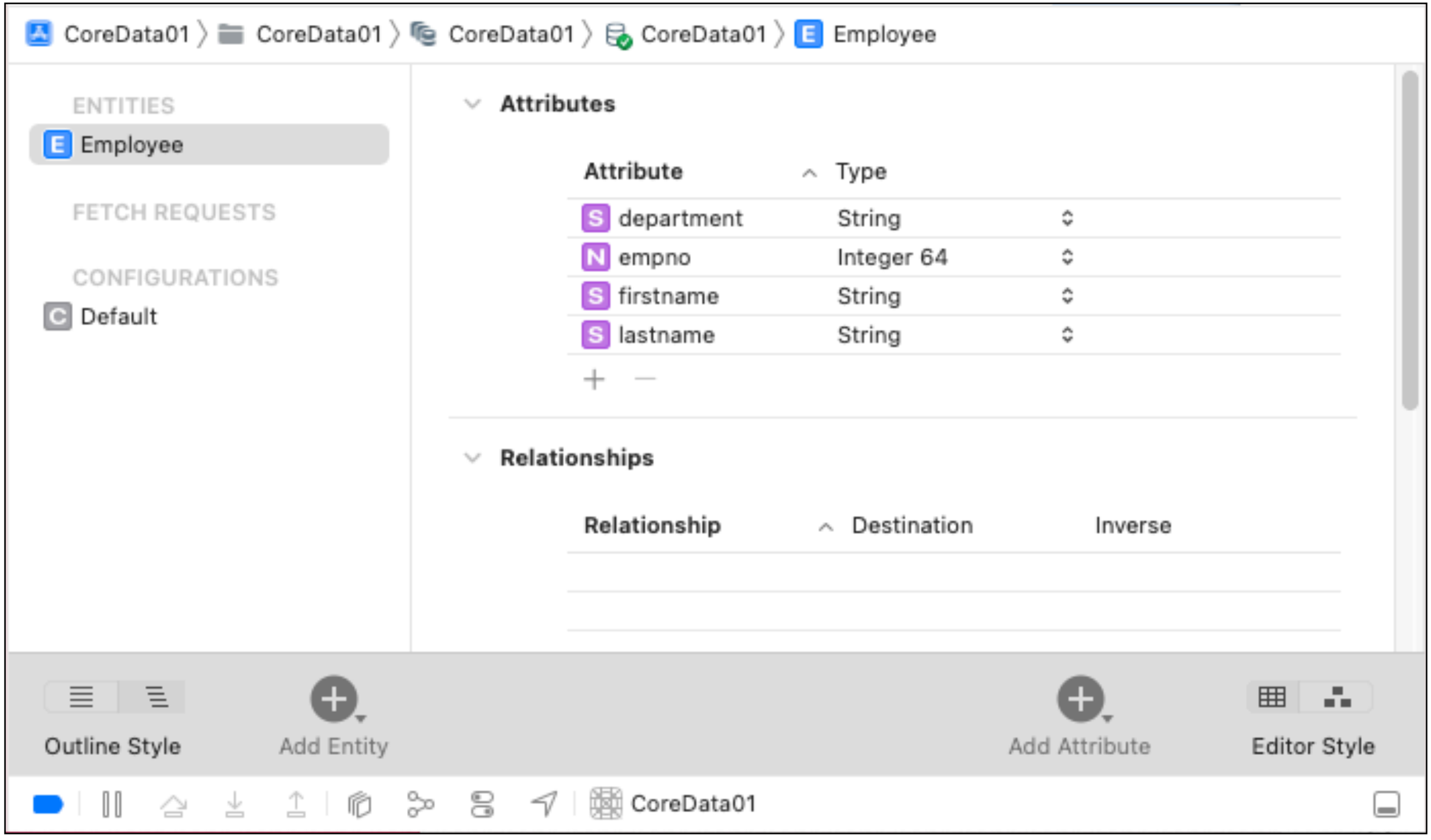
CoreData1:Datenbankmodell



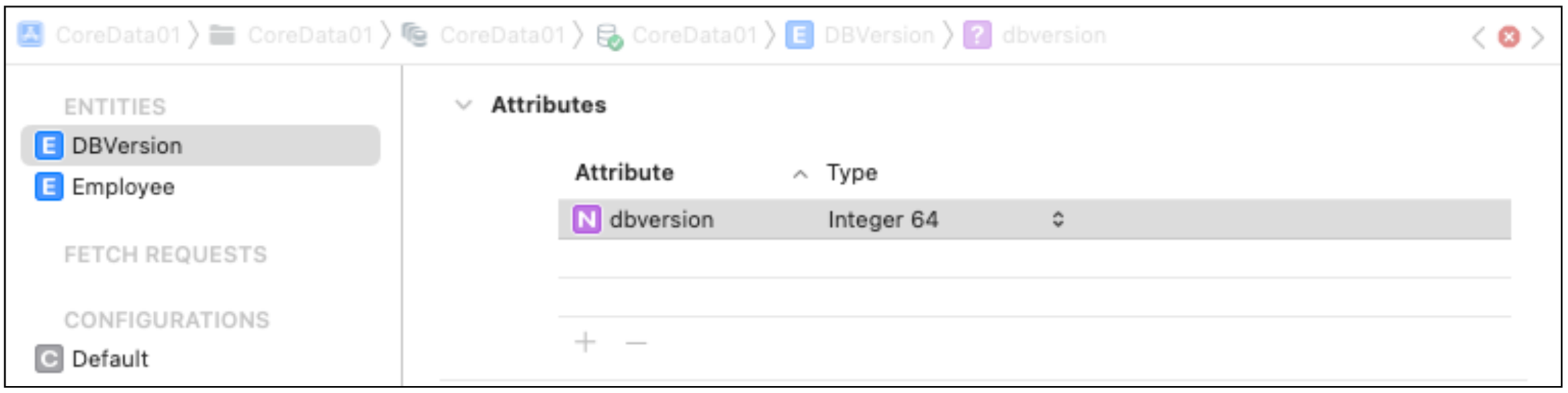
Wichtig

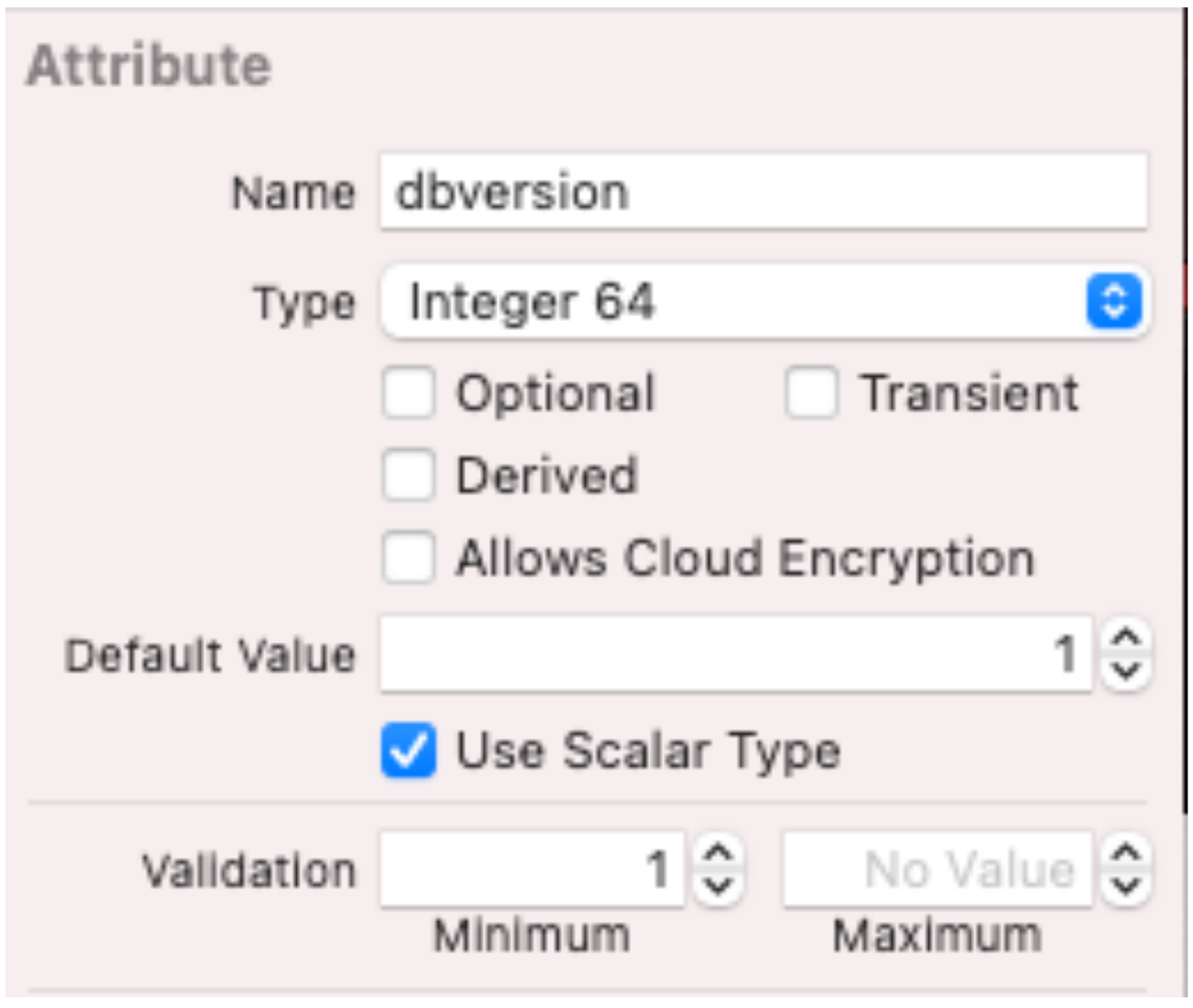
- Optional
- Default Value
- Min Length
- Max Length

CoreData1: Datenbankmodell Employee

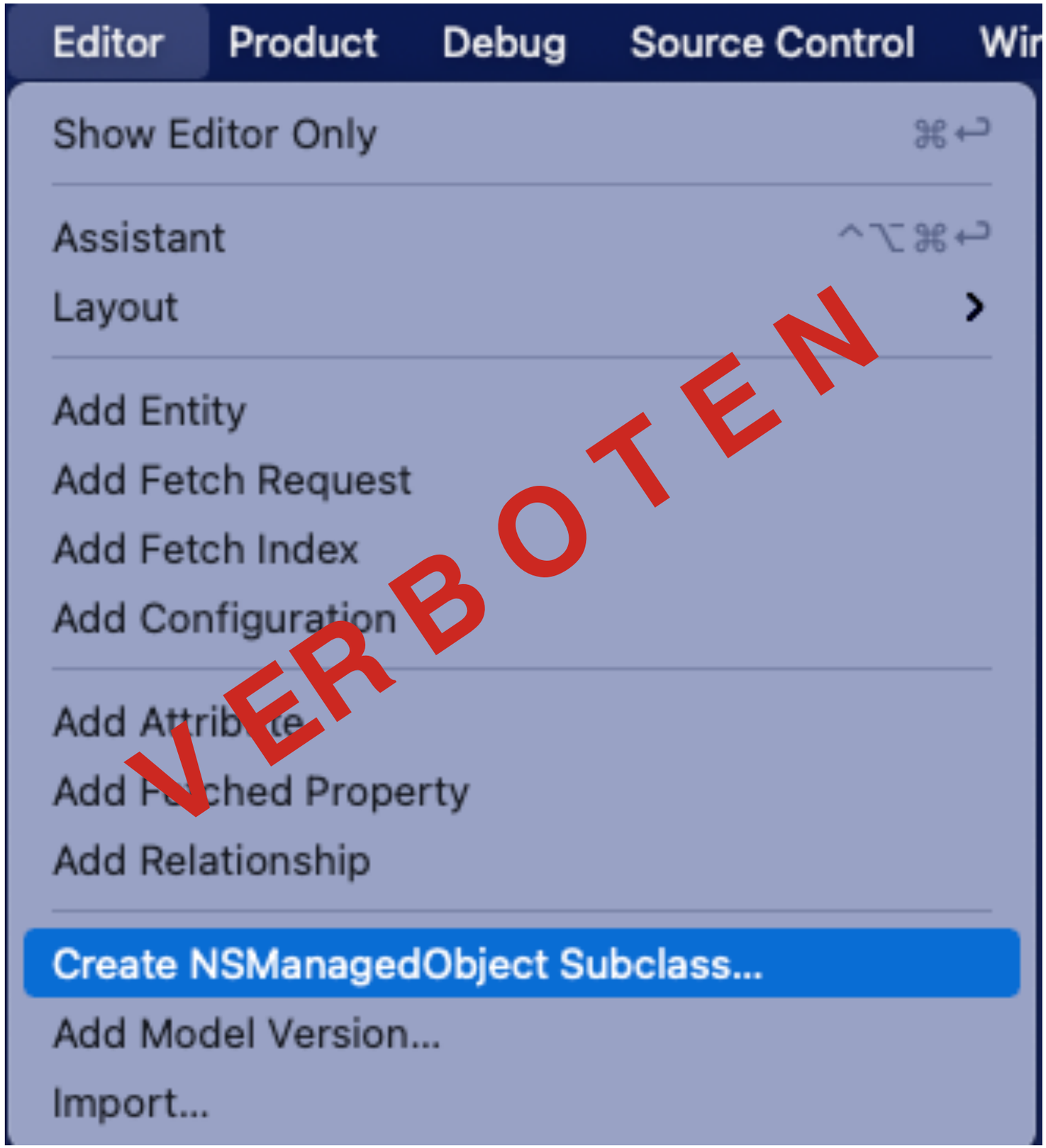


CoreData1: Datenbankmodell DBVersion

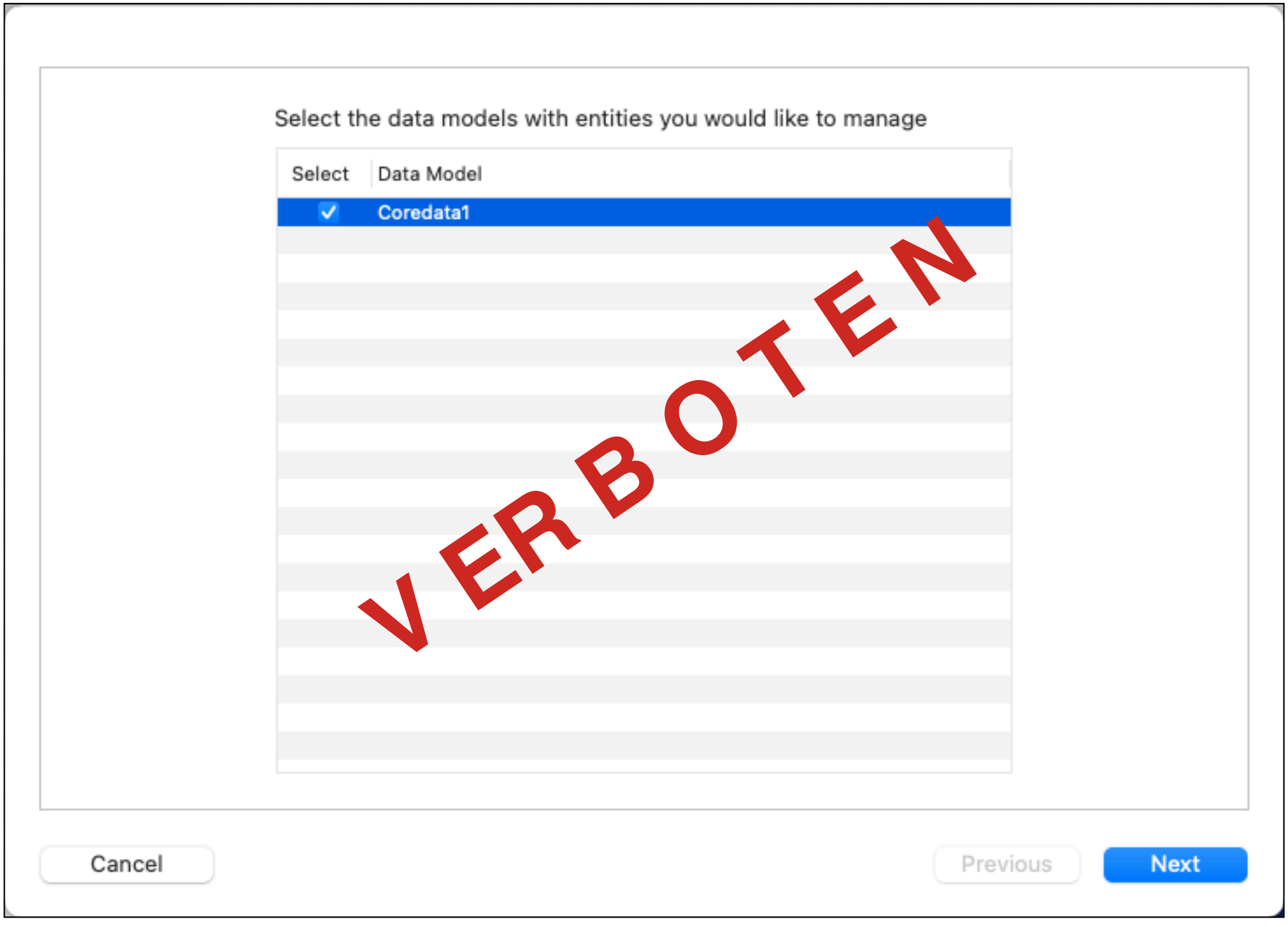




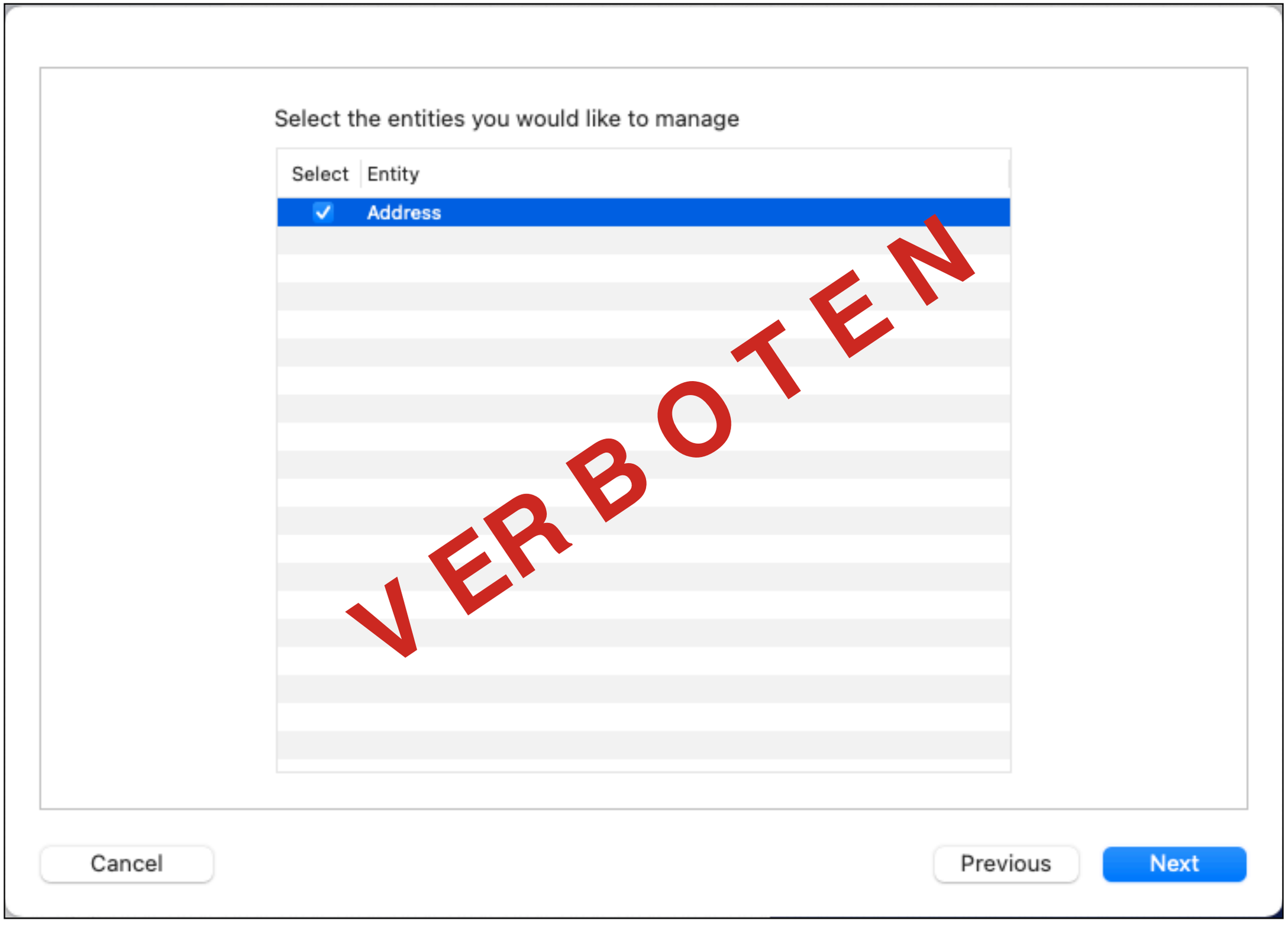
Erzeugen der Swift-Klassen aus dem Datenbankmodell



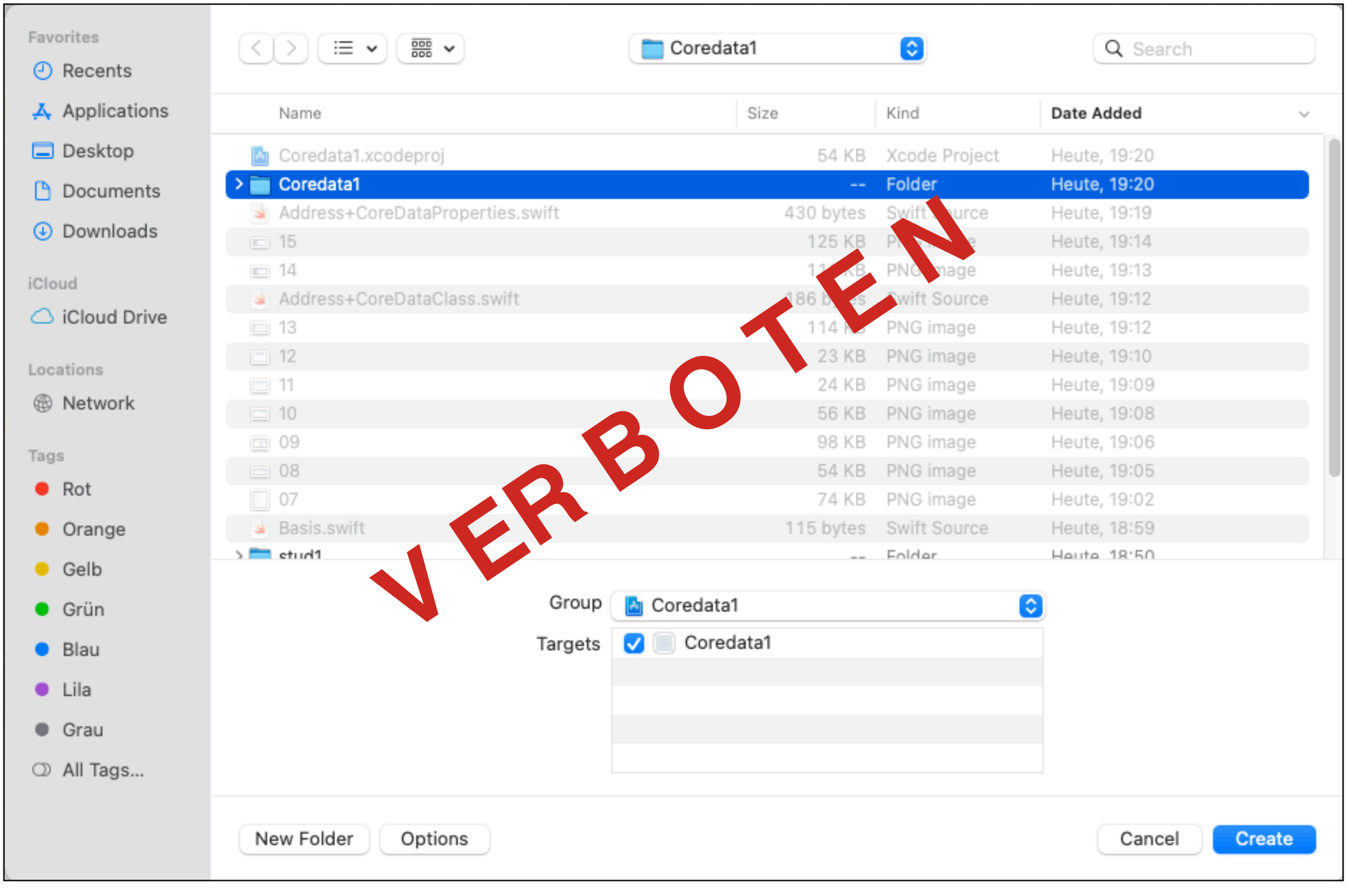
Alle gewünschten Tabellen anklicken

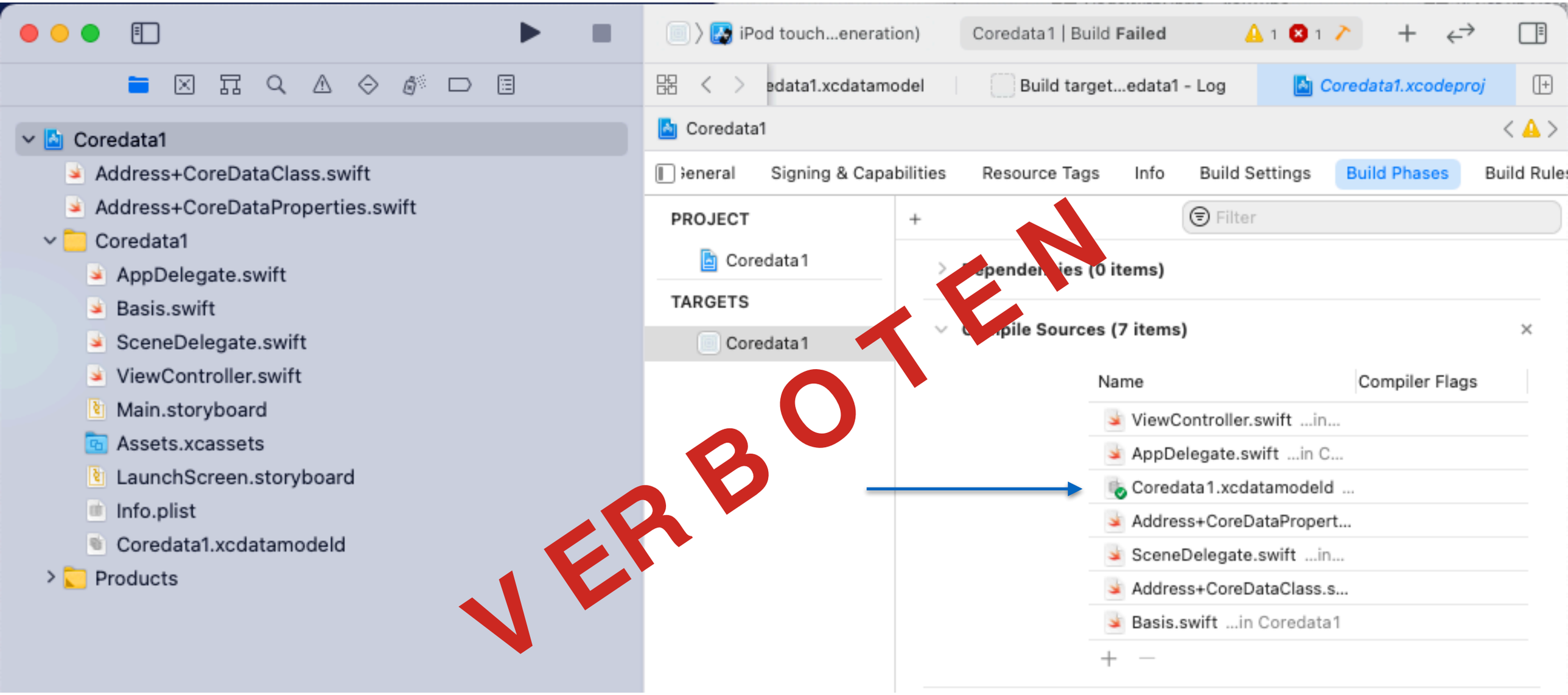


Alle gewünschten Tabellen anklicken



Speichern der neuen Dateien für die SQL-Tabelle





Nun den Eintrag „Coredata1“ löschen

https://stackoverflow.com/questions/50718018/xcode-10-error-multiple-commands-produce

Erstellen der Wrapper-Klassen (manuell)

Datei/Klasse: Employee

- Cmd N
- Cocoa Touch Class
- Class (Name): TBL_Employee (Employee ist schon vorhanden)
- SubClass: NSObject

Datei/Klasse: DBVersion

- Cmd N
- Cocoa Touch Class
- Class (Name): TBL_DBVersion
- SubClass: NSObject

Speichern der neuen Dateien für die SQL-Tabellen

```
import UIKit

class TBL_Employee: NSObject {
    public var firstname: String = ""
    public var lastname: String = ""
    public var empno: Int64 = -1;
    public var department: String = ""
}

class TBL_BVersion: NSObject {
    public var version: Int64 = -1;
}
```

Speichern der neuen Dateien für die SQL-Tabellen

```
import UIKit

class TBL_Employee: NSObject {
     public var database:NSManagedObject?
     public var firstname: String = ""
     public var lastname: String = ""
     public var empno: Int64 = -1;
     public var department: String = ""
}

    init(firstname:String, lastname:String,
          empno:Int64 ,department:String) {
          self.firstname = firstname
          self.lastname = lastname
          self.empno = empno
          self.department = department
     }
```

Speichern der neuen Dateien für die SQL-Tabellen

```
// toString
    override var description :String {
        return "Name: \(lastname),\(firstname)
                Number: \(empno)  Dept: \(department)"
    }
```

Speichern der neuen Dateien für die SQL-Tabellen

```
import UIKit

class TBL_DBVersion: NSObject {

    public var database:NSManagedObject?

    public var version: Int64 = -1;

}
```

Erstellen der DBQueries-Klasse

Datei/Klasse: DBSQueries

- Cmd N
- Cocoa Touch Class
- Class (Name): DBSQueries
- SubClass: NSObject

Klasse DBSQueries

```
import UIKit

import CoreData

class DBSQueries: NSObject {

    private static let instance = DBSQueries();

    private  override init() {
    }

    public static func getInstance ()->DBSQueries {
        return instance;
    }

    let TABLE_EMPLOYEE = "Employee"
    let TABLE_DBVERSION = "DBVersion"

    let FIRSTNAME = "firstname"
    let LASTNAME = "lastname"
    let EMPNO = "empno"
    let DEPARTMENT = "department"
```

Klasse DBSQueries

```
// NSManagedObjectContext
 func getConnection()->NSManagedObjectContext?{
   guard let appDelegate = UIApplication.shared.delegate as? AppDelegate
   else {
       print("error")
       return nil
   }

   let context = appDelegate.persistentContainer.viewContext
   return context
}
```

Klasse DBSQueries

```
func insertEmployee(_ emp:TBL_Employee )->Bool {
        if let context = getConnection() {
            guard let tableEmployee = NSEntityDescription.entity(forEntityName:
TABLE_EMPLOYEE, in: context)
            else {
                return false
            }
            let newEmployee = NSManagedObject(entity: tableEmployee,
             insertInto: context)

            newEmployee.setValue(emp.firstname, forKey: FIRSTNAME)
            newEmployee.setValue(emp.lastname, forKey: LASTNAME)
            newEmployee.setValue(emp.empno, forKey: EMPNO)
            newEmployee.setValue(emp.department, forKey: DEPARTMENT)

            // save Dataset
            do {
                try context.save()
                print("One employee are saved")
                return true
            } catch {
                print("save by error")
                print(error)
                return false
            }
        }
        else {
            return false
        }
    }  // insertEmployee
}
```

```
public func loadEmployees()  -> Array<TBL_Employee> {
    var employees = [TBL_Employee]()
    if let context = getConnection() {
        let request = NSFetchRequest<NSFetchRequestResult>(entityName: TABLE_EMPLOYEE)

        do {
            let results = try  context.fetch(request)
            for res in results {
                if let dbsEmployee = res as? NSManagedObject {
                    guard let firstname = dbsEmployee.value(forKey: FIRSTNAME) as? String else {
                          return employees
                    }
                    guard let lastname = dbsEmployee.value(forKey: LASTNAME) as? String else {
                            return employees
                    }
                    guard let empno = dbsEmployee.value(forKey: EMPNO) as? Int64 else {
                          return employees
                    }
                    guard let department = dbsEmployee.value(forKey: DEPARTMENT) as? String else {
                          return employees
                    }

                    let emp = TBL_Employee(firstname: firstname, lastname: lastname,
                                           empno: empno, department: department)
                    emp.database = dbsEmployee
                    employees.append(emp)
                }
            }
        }catch {
            print("load by error")
            print(error)
        }
    }
    else {
        //return employees
    }
    return employees
}
```

Klasse DBSQueries

```
public func deleteEmployee(emp:NSManagedObject)  -> Bool {

        if let context = getConnection() {
            context.delete(emp)
            do {
                try context.save()
                return true
            }
            catch {
                return false
            }
        }
        else {
            return false
        }

}
```

Klasse DBSQueries

```
public func updateEmployee(emp: NSManagedObject)->Bool {
      if let context = getConnection() {
            do {
                try context.save()
                return true
            }
            catch {
                return false
            }
      }
      else {
            return false
      }
}
```

CoreData1: InputDataController

Referenzen

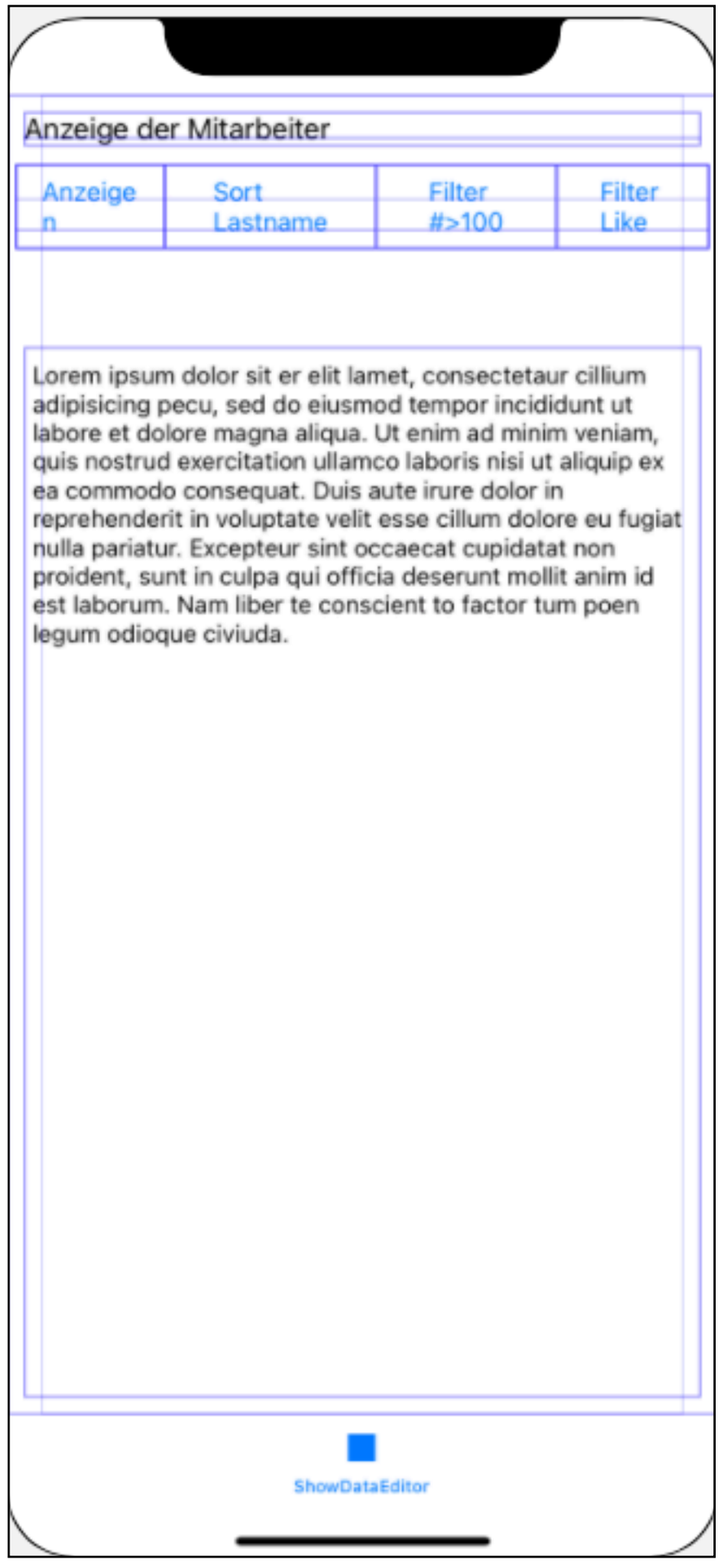
```
@IBOutlet var tFirstname: UITextField!

@IBOutlet var tLastname: UITextField!

@IBOutlet var tEmployeeNo: UITextField!

@IBOutlet var tDepartment: UITextField!
```

CoreData1: InputDataController

```
@IBAction func bnInsertDataClick(_ sender: UIButton) {
        let firstname = tFirstname.text?.trimmingCharacters(
                        in: .whitespacesAndNewlines)
        let lastname = tLastname.text?.trimmingCharacters(
                        in: .whitespacesAndNewlines)
        let department = tDepartment.text?.trimmingCharacters(
                        in: .whitespacesAndNewlines)
        let dummy = tEmployeeNo.text?.trimmingCharacters(
                        in: .whitespacesAndNewlines)

        let empno = Int64(dummy!)
        if (empno==nil) {
            print("Fehlerhafte Employee Number")
            return
        }

        var emp = TBL_Employee(firstname: firstname!, lastname: lastname!,
                  empno: empno!, department: department!)

        let dbsInstance = DBSQueries.getInstance()

        if !dbsInstance.insertEmployee(emp) {
            Basis.showOKDialog(parent: self, _title: "Fehler",
            _message: "Der Mitarbeiter konnte nicht eingefügt werden")
        }

    }  // bnInsertDataClick
```

ShowDataEditor Controller

- Label caption (T10, L10,R10)
- Hori-Stack (T10, L 5, R 5)
    A. Fill Equally (Proportionally)
    B. Button Anzeigen Fontsize: 15
    C. Button Sort nach lastname
    D. Filter Nmber>100
    E. Filter Firstname like
- TextView:
    F. tEditor (T10,L10,R10, B10)



ShowDataEditor Controller: Referenzen / Event

Main (Base) | ShowDataEditor | TestController | InputDataController | TBL_Employee | TBL_BVersion

CoreData01 〉 CoreData01 〉 ShowDataEditor 〉 No Selection

```
1  import UIKit
2
3  class ShowDataEditor: UIViewController {
4      @IBOutlet var tEditor: UITextView!
5
6      override func viewDidLoad() {
7          super.viewDidLoad()
8
9          tEditor.text = "Bitte auf den Schalter klicken"
10     }
11
12
13     @IBAction func bnShowDatasClick(_ sender: UIButton) {
14
15     }
16     @IBAction func bnShowDataSortlastnameClick(_ sender: UIButton) {
17     }
18
19     @IBAction func bnShowEmnpnoGT100Click(_ sender: Any) {
20     }
21     @IBAction func bnShowFilterLikeFirstnameClick(_ sender: Any) {
22     }
23
24 }
25
```

ShowDataEditor Controller: Methoden

```
@IBAction func bnShowDatasClick(_ sender: UIButton) {
  let dbsInstance = DBSQueries.getInstance()
  let  liste:Array<TBL_Employee> =
          dbsInstance.loadEmployees(sortListe: [],predicateListe: [])
  var s=""
  for emp  in liste {
     s+=emp.description+"\n"
  }
  tEditor.text = s
}
```

ShowDataEditor Controller: Methoden

```
@IBAction func bnShowDataSortlastnameClick(_ sender: UIButton) {
    let dbsInstance = DBSQueries.getInstance()

    let sortbyLastname = NSSortDescriptor.init(key: "lastname",ascending: true)
    let sortbyFirstname = NSSortDescriptor.init(key: "firstname",ascending: true)

    let  liste:Array<TBL_Employee> = dbsInstance.loadEmployees(
        sortListe: [sortbyLastname,sortbyFirstname],predicateListe: [])

    var s=""
    for emp  in liste {
        s+=emp.description+"\n"
    }
    tEditor.text = s
}
```

ShowDataEditor Controller: Methoden

```
@IBAction func bnShowEmnpnoGT100Click(_ sender: Any) {
    let dbsInstance = DBSQueries.getInstance()
    let predicateEmpnoGT100 = NSPredicate(format:"empno>%@","100")

    let  liste:Array<TBL_Employee> = dbsInstance.loadEmployees(
      sortListe: [],predicateListe: [predicateEmpnoGT100])

     var s=""
     for emp  in liste {
          s+=emp.description+"\n"
      }
    tEditor.text = s
}
```

ShowDataEditor Controller: Methoden

Filter: firstname = ‚Anna‘

```
@IBAction func bnShowFilterLikeFirstnameClick(_ sender: Any) {
    let dbsInstance = DBSQueries.getInstance()
    let predicateLikeFirstname1 = NSPredicate(
            format:"firstname LIKE %@","Anna"))


    let  liste:Array<TBL_Employee> = dbsInstance.loadEmployees(
          sortListe: [],predicateListe: [predicateLikeFirstname1])

    var s=""
    for emp  in liste {
        s+=emp.description+"\n"
    }
    tEditor.text = s

}
```

ShowDataEditor Controller: Methoden

Filter: firstname contains 'Anna'

```
@IBAction func bnShowFilterLikeFirstnameClick(_ sender: Any) {
    let dbsInstance = DBSQueries.getInstance()

    let predicateLikeFirstname2 = NSPredicate(
         format:"firstname CONTAINS %@","Anna")

    let  liste:Array<TBL_Employee> = dbsInstance.loadEmployees(
         sortListe: [],predicateListe: [predicateLikeFirstname2])

    var s=""
    for emp  in liste {
        s+=emp.description+"\n"
    }
    tEditor.text = s

}
```

ShowDataEditor Controller: Methoden

Filter: firstname beginswith 'Anna'

```
@IBAction func bnShowFilterLikeFirstnameClick(_ sender: Any) {
    let dbsInstance = DBSQueries.getInstance()

    let predicateLikeFirstname3 = NSPredicate(
        format:"firstname BEGINSWITH %@","Anna")

    let  liste:Array<TBL_Employee> = dbsInstance.loadEmployees(
         sortListe: [],predicateListe: [predicateLikeFirstname3])

    var s=""
    for emp  in liste {
        s+=emp.description+"\n"
    }
    tEditor.text = s

}
```

ShowDataEditor Controller: Methoden

Filter: firstname =‚Anna'

```
@IBAction func bnShowFilterLikeFirstnameClick(_ sender: Any) {
    let dbsInstance = DBSQueries.getInstance()
    let predicateLikeFirstname1 = NSPredicate(
            format:"firstname LIKE %@","Anna"))


    let  liste:Array<TBL_Employee> = dbsInstance.loadEmployees(
          sortListe: [],predicateListe: [predicateLikeFirstname1])

    var s=""
    for emp  in liste {
        s+=emp.description+"\n"
    }
    tEditor.text = s

}
```

ShowDataEditor Controller: Methoden

Filter: firstname MATCHES '?nna*'

```
@IBAction func bnShowFilterLikeFirstnameClick(_ sender: Any) {
    let dbsInstance = DBSQueries.getInstance()

    let patternA="?nna*"
    let predicateLikeFirstname4a = NSPredicate(
       format:"firstname LIKE %@",patternA)

    let patternB="?nna*"
    let predicateLikeFirstname4c = NSPredicate(
        format:"firstname MATCHES %@",patternC)

    let  liste:Array<TBL_Employee> = dbsInstance.loadEmployees(
         sortListe: [],predicateListe: [predicateLikeFirstname1])

    var s=""
    for emp  in liste {
        s+=emp.description+"\n"
    }
    tEditor.text = s

}
```