Mobile Application Programming
Memory
Object Graphs

- Window
- View Controller
  - Root View
    - Header View
    - Collection View
    - Footer View
  - Add Button
  - Title
  - Item
  - Item
  - Item
  - Title
  - Refresh
  - Icon
  - Content Label
  - Detail Label
    - Image
    - Text
    - Text
Automatic Reference Counting (ARC)

- Swift uses ARC to determine object liveness
- The number of other objects that have obtained a reference to an object is called its reference count
- When an object is created it is referenced by the local variable it is assigned to (or property if that is the case)
- As other objects obtain references the count increases
- Objects can remove references as well, reducing the count
  - Setting a property to nil or another object
  - A local variable going out of scope
- When an object has no more references, it is deleted
Strong and Weak

- Reference relationships can have the modifiers **strong** and **weak**
  - **strong** and **weak** properties (weak var someProperty: Double?)
  - **strong** and **weak** local variables (weak var localVar: Double?)
- Strong references (default) **increase an object’s reference count**
- Weak references **do not increase an object’s reference count**
- When the last strong reference to an object is removed, the object is **immediately deleted**, **deinit called**, and the **memory is reclaimed**
- Any weak references to the object that remain are **set to nil**
- Because of this, weak properties and variables **must be optional**
Item Removed
Item Removed
Item Removed
Item Removed
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Legend:
- View Controller
- Container View
- Content View
- View Property
- Reference
View Controller Change

Legend
- View Controller
- Container View
- Content View
- View Property
- Reference

Window

View Controller

Root View

Header View
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Collection View
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- Text

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Refresh
View Controller Change

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Huge Memory Leak!!!
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  - Weak Delegate
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View Controller Change

Legend
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- Container View
- Content View
- View Property
  - Reference
  - Delegate

Diagram:
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        - Title
        - Refresh
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          - Content Label
          - Detail Label
            - Image
            - Text
            - Text
View Controller Change

Legend
- View Controller
- Container View
- Content View
- View Property
- Reference
- Delegate

Window

View Controller

Root View

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Refresh