7) Memory Management

1) What is Reference Counting and how does it work?
   1) On which types is Reference Counting applied?
   2) When is an object retained and released?
2) Why are IBOutlets declared ‘weak’ by default when a connection between view controller and
   view is created via interface builder?
3) Explain the difference between weak and unowned properties and the implication on the type
   of the property declared as either weak or unowned.
4) Does the following code snippet contains a potential retain cycle? (Y/N)
   ```swift
   class car {
     var owner: CarDriver
   }
   
   class Person {
     let firstName, lastName: String
   }
   
   class CarDriver: Person {
     var car: Car?
   }
   ```

   1) If the code snippet contains a potential retain cycle, explain where the cycle could occur
      and how you would resolve the issue. If no retain cycle is present, explain why there is no
      retain cycle between the instances of the classes.
5) Does the following code snippet contains a potential retain cycle? (Y/N)
   ```swift
   class BooksViewController: UITableViewController {
     var books = [Book]()
     
     override func prepareForSegue(_ segue: UIStoryboardSegue, sender: AnyObject) {
       if segue.identifier == "AddBookSegue" {
         if let controller = segue.destinationViewController as? AddBookViewController {
           controller.delegate = { [weak self] (book) -> Void in
             if let b = book {
               self?.books.append(b)
             }
           }
         }
       }
     }
   }
   ```

   ```swift
   class AddBookViewController: UIViewController {
     var completionHandler: ( (book: Book?) -> Void )?
     
     @IBAction save(sender: AnyObject) {
       let book = Book(/** Initialized from Outlets */)
       completionHandler?(book)
     }
     
     @IBAction cancel(sender: AnyObject) {
       completionHandler?(nil)
     }
   }
   ```
1) If the code snippet contains a potential retain cycle, explain where the cycle could occur and how you would resolve the issue. If no retain cycle is present, explain why there is no retain cycle between the instances of the classes.

Aids

- In tasks 4 and 5 the respective code snippets might be incomplete in order to compile directly. However, all important information are given in order to give an answer.