```objc
 1. //
 2. //  HelloLabelAppDelegate.h
 3. //  HelloLabel
 4. //
 5. //  David J. Malan
 6. //  Harvard University
 7. //  dmalan@harvard.edu
 8. //
 9. //  Demonstrates a Window-based Application with a UILabel.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @interface HelloLabelAppDelegate : NSObject <UIApplicationDelegate> {
15. }
16.
17. @property (nonatomic, retain) IBOutlet UIWindow *window;
18.
19. @end
```

```objc
 1.  //
 2.  //  HelloLabelAppDelegate.m
 3.  //  HelloLabel
 4.  //
 5.  //  David J. Malan
 6.  //  Harvard University
 7.  //  dmalan@harvard.edu
 8.  //
 9.  //  Demonstrates a Window-based Application with a UILabel.
10.  //
11.
12.  #import "HelloLabelAppDelegate.h"
13.
14.  @implementation HelloLabelAppDelegate
15.
16.  @synthesize window=_window;
17.
18.  - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
19.  {
20.      [self.window makeKeyAndVisible];
21.      return YES;
22.  }
23.
24.  - (void)dealloc
25.  {
26.      [_window release];
27.      [super dealloc];
28.  }
29.
30.  @end
```

```objectivec
 1.   //
 2.   //  main.m
 3.   //  HelloLabel
 4.   //
 5.   //  David J. Malan
 6.   //  Harvard University
 7.   //  dmalan@harvard.edu
 8.   //
 9.   //  Demonstrates a Window-based Application with a UILabel.
10.   //
11.
12.   #import <UIKit/UIKit.h>
13.
14.   int main(int argc, char *argv[])
15.   {
16.       NSAutoreleasePool *pool = [[NSAutoreleasePool alloc] init];
17.       int retVal = UIApplicationMain(argc, argv, nil, nil);
18.       [pool release];
19.       return retVal;
20.   }
```

```objc
 1. //
 2. //  LeakyAppDelegate.h
 3. //  Leaky
 4. //
 5. //  David J. Malan
 6. //  Harvard University
 7. //  dmalan@harvard.edu
 8. //
 9. //  Demonstrates memory leak.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @class LeakyViewController;
15.
16. @interface LeakyAppDelegate : NSObject <UIApplicationDelegate> {
17. }
18.
19. @property (nonatomic, retain) IBOutlet LeakyViewController *viewController;
20. @property (nonatomic, retain) IBOutlet UIWindow *window;
21.
22. @end
```

```objc
1.  //
2.  //  LeakyAppDelegate.m
3.  //  Leaky
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates memory leak.
10. //
11.
12. #import "LeakyAppDelegate.h"
13. #import "LeakyViewController.h"
14.
15. @implementation LeakyAppDelegate
16.
17. @synthesize viewController=_viewController;
18. @synthesize window=_window;
19.
20. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
21. {
22.     self.window.rootViewController = self.viewController;
23.     [self.window makeKeyAndVisible];
24.     return YES;
25. }
26.
27. - (void)dealloc
28. {
29.     [_viewController release];
30.     [_window release];
31.     [super dealloc];
32. }
33.
34. @end
```

```objc
1.  //
2.  //  LeakyViewController.h
3.  //  Leaky
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates memory leak.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @interface LeakyViewController : UIViewController {
15. }
16.
17. - (IBAction)press:(id)sender;
18.
19. @end
```

```
1.   //
2.   //  LeakyViewController.m
3.   //  Leaky
4.   //
5.   //  David J. Malan
6.   //  Harvard University
7.   //  dmalan@harvard.edu
8.   //
9.   //  Demonstrates memory leak.
10.  //
11.
12.  #import "LeakyViewController.h"
13.
14.  @implementation LeakyViewController
15.
16.  - (IBAction)press:(id)sender
17.  {
18.      // log how many times button's been pressed
19.      static int n = 0;
20.      NSString *s = [[NSString alloc] initWithFormat:@"%d", n];
21.      NSLog(@"%@", s);
22.      n++;
23.  }
24.
25.  @end
```

```objc
1.  //
2.  //  main.m
3.  //  Leaky
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates memory leak.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. int main(int argc, char *argv[])
15. {
16.     NSAutoreleasePool *pool = [[NSAutoreleasePool alloc] init];
17.     int retVal = UIApplicationMain(argc, argv, nil, nil);
18.     [pool release];
19.     return retVal;
20. }
```

```objc
1.  //
2.  //  Controller.h
3.  //  Nib1
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus IBAction and IBOutlet.
10. //
11.
12. #import <Foundation/Foundation.h>
13.
14. @interface Controller : NSObject {
15. }
16.
17. @property (nonatomic, retain) IBOutlet UITextField *textField;
18.
19. - (IBAction)done:(id)sender;
20. - (IBAction)go:(id)sender;
21.
22. @end
```

```
1.  //
2.  //  Controller.m
3.  //  Nib1
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus IBAction and IBOutlet.
10. //
11.
12. #import "Controller.h"
13.
14. @implementation Controller
15.
16. @synthesize textField=_textField;
17.
18. - (IBAction)done:(id)sender
19. {
20.     // hide keyboard
21.     [sender resignFirstResponder];
22. }
23.
24. - (IBAction)go:(id)sender
25. {
26.     // hide keyboard
27.     [self.textField resignFirstResponder];
28.
29.     // show alert
30.     NSString *s = [NSString stringWithFormat:@"Hello, %@", self.textField.text];
31.     UIAlertView *alert = [[UIAlertView alloc] initWithTitle:@"Hello"
32.                                                     message:s
33.                                                    delegate:nil
34.                                           cancelButtonTitle:@"Thanks!"
35.                                           otherButtonTitles:nil];
36.     [alert show];
37.     [alert release];
38. }
39.
40. - (void)dealloc
41. {
42.     [_textField release];
43.     [super dealloc];
44. }
45.
46. @end
```

```
1.  //
2.  //  Nib1AppDelegate.h
3.  //  Nib1
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus IBAction and IBOutlet.
10. //
11.
12. #import <UIKit/UIKit.h>
13. #import "Controller.h"
14.
15. @interface Nib1AppDelegate : NSObject <UIApplicationDelegate> {
16. }
17.
18. @property (nonatomic, retain) IBOutlet Controller *controller;
19. @property (nonatomic, retain) IBOutlet UIWindow *window;
20.
21. @end
```

```objc
1.  //
2.  //  Nib1AppDelegate.m
3.  //  Nib1
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus IBAction and IBOutlet.
10. //
11.
12. #import "Nib1AppDelegate.h"
13.
14. @implementation Nib1AppDelegate
15.
16. @synthesize controller=_controller;
17. @synthesize window=_window;
18.
19. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
20. {
21.     [self.window makeKeyAndVisible];
22.     return YES;
23. }
24.
25. - (void)dealloc
26. {
27.     [_controller release];
28.     [_window release];
29.     [super dealloc];
30. }
31.
32. @end
```

```objc
1.  //
2.  //  Nib1AppDelegate.m
3.  //  Nib1
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus IBAction and IBOutlet.
10. //

11.

12. #import <UIKit/UIKit.h>

13.

14. int main(int argc, char *argv[])
15. {
16.     NSAutoreleasePool *pool = [[NSAutoreleasePool alloc] init];
17.     int retVal = UIApplicationMain(argc, argv, nil, nil);
18.     [pool release];
19.     return retVal;
20. }
```

```objc
1.  //
2.  //  Controller.h
3.  //  Nib2
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //
12.
13. #import <Foundation/Foundation.h>
14.
15. @interface Controller : NSObject <UIAlertViewDelegate> {
16. }
17.
18. @property (nonatomic, retain) IBOutlet UITextField *textField;
19.
20. - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex;
21. - (IBAction)go:(id)sender;
22.
23. @end
```

```objectivec
1.  //
2.  //  Controller.m
3.  //  Nib2
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //
12.
13. #import "Controller.h"
14.
15. @implementation Controller
16.
17. @synthesize textField=_textField;
18.
19. - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex
20. {
21.     // clear text field
22.     self.textField.text = nil;
23. }
24.
25. - (IBAction)go:(id)sender
26. {
27.     // hide keyboard
28.     [self.textField resignFirstResponder];
29.
30.     // show alert
31.     NSString *s = [NSString stringWithFormat:@"Hello, %@", self.textField.text];
32.     UIAlertView *alert = [[UIAlertView alloc] initWithTitle:@"Hello"
33.                                                     message:s
34.                                                    delegate:self
35.                                           cancelButtonTitle:@"Thanks!"
36.                                           otherButtonTitles:nil];
37.     [alert show];
38.     [alert release];
39. }
40.
41. - (void)dealloc
42. {
43.     [_textField release];
44.     [super dealloc];
45. }
46.
47. @end
```

```
1.  //
2.  //  Nib2AppDelegate.h
3.  //  Nib2
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //
12.
13. #import <UIKit/UIKit.h>
14. #import "Controller.h"
15.
16. @interface Nib2AppDelegate : NSObject <UIApplicationDelegate> {
17. }
18.
19. @property (nonatomic, retain) IBOutlet Controller *controller;
20. @property (nonatomic, retain) IBOutlet UIWindow *window;
21.
22. @end
```

```objc
1.  //
2.  //  Nib2AppDelegate.m
3.  //  Nib2
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented with a nib, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //

13. #import "Nib2AppDelegate.h"

15. @implementation Nib2AppDelegate

17. @synthesize controller=_controller;
18. @synthesize window=_window;

20. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
21. {
22.     [self.window makeKeyAndVisible];
23.     return YES;
24. }

26. - (void)dealloc
27. {
28.     [_controller release];
29.     [_window release];
30.     [super dealloc];
31. }

33. @end
```

```objectivec
 1.  //
 2.  //  Controller.m
 3.  //  Nib2
 4.  //
 5.  //  David J. Malan
 6.  //  Harvard University
 7.  //  dmalan@harvard.edu
 8.  //
 9.  //  Demonstrates a Window-based Application implemented with a nib, plus
10.  //  UIAlertViewDelegate and reuse of IBAction.
11.  //
12.
13.  #import <UIKit/UIKit.h>
14.
15.  int main(int argc, char *argv[])
16.  {
17.      NSAutoreleasePool *pool = [[NSAutoreleasePool alloc] init];
18.      int retVal = UIApplicationMain(argc, argv, nil, nil);
19.      [pool release];
20.      return retVal;
21.  }
```

```objc
 1. //
 2. //  Controller.h
 3. //  NoNib
 4. //
 5. //  David J. Malan
 6. //  Harvard University
 7. //  dmalan@harvard.edu
 8. //
 9. //  Demonstrates a Window-based Application implemented programmatically.
10. //
11.
12. #import <Foundation/Foundation.h>
13.
14. @interface Controller : NSObject <UIAlertViewDelegate> {
15. }
16.
17. @property (nonatomic, retain) UITextField *textField;
18. @property (nonatomic, retain) UIView *view;
19.
20. - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex;
21. - (void)go:(id)sender;
22.
23. @end
```

```objc
1.  //
2.  //  Controller.m
3.  //  NoNib
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented programmatically.
10. //

12. #import "Controller.h"

14. @implementation Controller

16. @synthesize textField=_textField;
17. @synthesize view=_view;

19. - (id)init
20. {
21.     // create view
22.     self.view = [[UIView alloc] initWithFrame:[UIScreen mainScreen].applicationFrame];

24.     // create text field
25.     CGRect frame = CGRectMake(20, 20, 280, 31);
26.     self.textField = [[UITextField alloc] initWithFrame:frame];
27.     self.textField.autocapitalizationType = UITextAutocapitalizationTypeWords;
28.     self.textField.autocorrectionType = UITextAutocorrectionTypeNo;
29.     self.textField.borderStyle = UITextBorderStyleRoundedRect;
30.     self.textField.contentVerticalAlignment = UIControlContentVerticalAlignmentCenter;
31.     self.textField.font = [UIFont systemFontOfSize:[UIFont systemFontSize]];
32.     self.textField.placeholder = @"Name";
33.     self.textField.returnKeyType = UIReturnKeyGo;

35.     // listen for Did End on Exit
36.     [self.textField addTarget:self action:@selector(go:) forControlEvents:UIControlEventEditingDidEndOnExit];

38.     // add text field to view
39.     [self.view addSubview:self.textField];

41.     // create button
42.     frame = CGRectMake(124, 59, 72, 37);
43.     UIButton *button = [UIButton buttonWithType:UIButtonTypeRoundedRect];
44.     button.frame = frame;
45.     [button setTitle:@"Go" forState:UIControlStateNormal];

47.     // listen for Touch Up Inside
48.     [button addTarget:self action:@selector(go:) forControlEvents:UIControlEventTouchUpInside];
```

```objc
49.
50.        // add button to view
51.        [self.view addSubview:button];
52.
53.        return self;
54.   }
55.
56.   - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex
57.   {
58.        // clear text field
59.        self.textField.text = nil;
60.   }
61.
62.   - (void)go:(id)sender
63.   {
64.        // hide keyboard
65.        [self.textField resignFirstResponder];
66.
67.        // show alert
68.        NSString *s = [NSString stringWithFormat:@"Hello, %@", self.textField.text];
69.        UIAlertView *alert = [[UIAlertView alloc] initWithTitle:@"Hello"
70.                                                        message:s
71.                                                       delegate:self
72.                                              cancelButtonTitle:@"Thanks!"
73.                                              otherButtonTitles:nil];
74.        [alert show];
75.        [alert release];
76.   }
77.
78.   - (void)dealloc
79.   {
80.        [_textField release];
81.        [_view release];
82.        [super dealloc];
83.   }
84.
85.   @end
```

```objc
 1.  //
 2.  //  NoNibAppDelegate.h
 3.  //  NoNib
 4.  //
 5.  //  David J. Malan
 6.  //  Harvard University
 7.  //  dmalan@harvard.edu
 8.  //
 9.  //  Demonstrates a Window-based Application implemented programmatically.
10.  //
11.
12.  #import <UIKit/UIKit.h>
13.  #import "Controller.h"
14.
15.  @interface NoNibAppDelegate : NSObject <UIApplicationDelegate> {
16.  }
17.
18.  @property (nonatomic, retain) Controller *controller;
19.  @property (nonatomic, retain) IBOutlet UIWindow *window;
20.
21.  @end
```

```
1.  //
2.  //  NoNibAppDelegate.m
3.  //  NoNib
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented programmatically.
10. //
11.
12. #import "Controller.h"
13. #import "NoNibAppDelegate.h"
14.
15. @implementation NoNibAppDelegate
16.
17. @synthesize controller=_controller;
18. @synthesize window=_window;
19.
20. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
21. {
22.     self.controller = [[Controller alloc] init];
23.     [self.window addSubview:self.controller.view];
24.     [self.window makeKeyAndVisible];
25.     return YES;
26. }
27.
28. - (void)dealloc
29. {
30.     [_controller release];
31.     [_window release];
32.     [super dealloc];
33. }
34.
35. @end
```

```objc
1.  //
2.  //  main.m
3.  //  NoNib
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a Window-based Application implemented programmatically.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. int main(int argc, char *argv[])
15. {
16.     NSAutoreleasePool *pool = [[NSAutoreleasePool alloc] init];
17.     int retVal = UIApplicationMain(argc, argv, nil, nil);
18.     [pool release];
19.     return retVal;
20. }
```

```objc
1.  //
2.  //  ViewControllerAppDelegate.h
3.  //  ViewController
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a View-based Application implemented with two nibs, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //
12.
13. #import <UIKit/UIKit.h>
14.
15. @class ViewControllerViewController;
16.
17. @interface ViewControllerAppDelegate : NSObject <UIApplicationDelegate> {
18. }
19.
20. @property (nonatomic, retain) IBOutlet ViewControllerViewController *viewController;
21. @property (nonatomic, retain) IBOutlet UIWindow *window;
22.
23. @end
```

```objectivec
1.  //
2.  //  ViewControllerAppDelegate.m
3.  //  ViewController
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a View-based Application implemented with two nibs, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //
12.
13. #import "ViewControllerAppDelegate.h"
14. #import "ViewControllerViewController.h"
15.
16. @implementation ViewControllerAppDelegate
17.
18. @synthesize viewController=_viewController;
19. @synthesize window=_window;
20.
21. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
22. {
23.     self.window.rootViewController = self.viewController;
24.     [self.window makeKeyAndVisible];
25.     return YES;
26. }
27.
28. - (void)dealloc
29. {
30.     [_viewController release];
31.     [_window release];
32.     [super dealloc];
33. }
34.
35. @end
```

```objc
 1. //
 2. //  ViewControllerViewController.h
 3. //  ViewController
 4. //
 5. //  David J. Malan
 6. //  Harvard University
 7. //  dmalan@harvard.edu
 8. //
 9. //  Demonstrates a View-based Application implemented with two nibs, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //
12.
13. #import <UIKit/UIKit.h>
14.
15. @interface ViewControllerViewController : UIViewController <UIAlertViewDelegate> {
16. }
17.
18. @property (nonatomic, retain) IBOutlet UITextField *textField;
19.
20. - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex;
21. - (IBAction)go:(id)sender;
22.
23. @end
```

```objc
1.  //
2.  //  ViewControllerViewController.m
3.  //  ViewController
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  dmalan@harvard.edu
8.  //
9.  //  Demonstrates a View-based Application implemented with two nibs, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //
12.
13. #import "ViewControllerViewController.h"
14.
15. @implementation ViewControllerViewController
16.
17. @synthesize textField=_textField;
18.
19. - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex
20. {
21.     // clear text field
22.     self.textField.text = nil;
23. }
24.
25. - (IBAction)go:(id)sender
26. {
27.     // hide keyboard
28.     [self.textField resignFirstResponder];
29.
30.     // show alert
31.     NSString *s = [NSString stringWithFormat:@"Hello, %@", self.textField.text];
32.     UIAlertView *alert = [[UIAlertView alloc] initWithTitle:@"Hello"
33.                                                     message:s
34.                                                    delegate:self
35.                                           cancelButtonTitle:@"Thanks!"
36.                                           otherButtonTitles:nil];
37.     [alert show];
38.     [alert release];
39. }
40.
41. - (BOOL)shouldAutorotateToInterfaceOrientation:(UIInterfaceOrientation)interfaceOrientation
42. {
43.     // support all orientations
44.     return YES;
45. }
46.
47. - (void)dealloc
48. {
```

```
49.        [_textField release];
50.        [super dealloc];
51.    }
52.
53.    @end
```

```objc
1.  //
2.  //  main.m
3.  //  ViewController
4.  //
5.  //  David J. Malan
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8.  //
9.  //  Demonstrates a View-based Application implemented with two nibs, plus
10. //  UIAlertViewDelegate and reuse of IBAction.
11. //
12.
13. #import <UIKit/UIKit.h>
14.
15. int main(int argc, char *argv[])
16. {
17.     NSAutoreleasePool *pool = [[NSAutoreleasePool alloc] init];
18.     int retVal = UIApplicationMain(argc, argv, nil, nil);
19.     [pool release];
20.     return retVal;
21. }
```