```objc
1.  //
2.  //  AppDelegate.h
3.  //  Nib1
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application implemented with a nib, plus IBAction and IBOutlet.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @class ViewController;
15.
16. @interface AppDelegate : UIResponder <UIApplicationDelegate>
17.
18. @property (strong, nonatomic) ViewController *viewController;
19. @property (strong, nonatomic) UIWindow *window;
20.
21. @end
```

```objc
1.  //
2.  //  AppDelegate.m
3.  //  Nib1
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application implemented with a nib, plus IBAction and IBOutlet.
10. //

12. #import "AppDelegate.h"
13. #import "ViewController.h"

15. @implementation AppDelegate

17. @synthesize viewController = _viewController;
18. @synthesize window = _window;

20. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
21. {
22.     self.window = [[UIWindow alloc] initWithFrame:[[UIScreen mainScreen] bounds]];
23.     self.viewController = [[ViewController alloc] initWithNibName:@"ViewController" bundle:nil];
24.     self.window.rootViewController = self.viewController;
25.     [self.window makeKeyAndVisible];
26.     return YES;
27. }

29. @end
```

```
1.  //
2.  //  ViewController.h
3.  //  Nib1
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application implemented with a nib, plus IBAction and IBOutlet.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @interface ViewController : UIViewController
15.
16. @property (nonatomic, strong) IBOutlet UITextField *textField;
17.
18. - (IBAction)go:(id)sender;
19.
20. @end
```

```objc
1.   //
2.   //  ViewController.m
3.   //  Nib1
4.   //
5.   //  David J. Malan
6.   //  Harvard University
7.   //  malan@harvard.edu
8.   //
9.   //  Demonstrates a Single View Application implemented with a nib, plus IBAction and IBOutlet.
10.  //
11.
12.  #import "ViewController.h"
13.
14.  @implementation ViewController
15.
16.  @synthesize textField=_textField;
17.
18.  - (IBAction)go:(id)sender
19.  {
20.      // hide keyboard
21.      [self.textField resignFirstResponder];
22.
23.      // show alert
24.      NSString *s = [NSString stringWithFormat:@"Hello, %@", self.textField.text];
25.      UIAlertView *alert = [[UIAlertView alloc] initWithTitle:@"Hello"
26.                                                      message:s
27.                                                     delegate:nil
28.                                            cancelButtonTitle:@"Thanks!"
29.                                            otherButtonTitles:nil];
30.      [alert show];
31.  }
32.
33.  @end
```

```
1.  //
2.  //  AppDelegate.h
3.  //  Nib2
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application with a UIAlertViewDelegate.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @class ViewController;
15.
16. @interface AppDelegate : UIResponder <UIApplicationDelegate>
17.
18. @property (strong, nonatomic) ViewController *viewController;
19. @property (strong, nonatomic) UIWindow *window;
20.
21. @end
```

```objc
1.  //
2.  //  AppDelegate.m
3.  //  Nib2
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application with a UIAlertViewDelegate.
10. //
11.
12. #import "AppDelegate.h"
13. #import "ViewController.h"
14.
15. @implementation AppDelegate
16.
17. @synthesize viewController = _viewController;
18. @synthesize window = _window;
19.
20. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
21. {
22.     self.window = [[UIWindow alloc] initWithFrame:[[UIScreen mainScreen] bounds]];
23.     self.viewController = [[ViewController alloc] initWithNibName:@"ViewController" bundle:nil];
24.     self.window.rootViewController = self.viewController;
25.     [self.window makeKeyAndVisible];
26.     return YES;
27. }
28.
29. @end
```

```objc
1.  //
2.  //  ViewController.h
3.  //  Nib2
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application with a UIAlertViewDelegate.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @interface ViewController : UIViewController <UIAlertViewDelegate>
15.
16. @property (nonatomic, strong) IBOutlet UITextField *textField;
17.
18. - (IBAction)go:(id)sender;
19.
20. @end
```

```objc
1.  //
2.  //  ViewController.m
3.  //  Nib2
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application with a UIAlertViewDelegate.
10. //
11.
12. #import "ViewController.h"
13.
14. @implementation ViewController
15.
16. @synthesize textField=_textField;
17.
18. - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex
19. {
20.     // clear text field
21.     self.textField.text = nil;
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:self
34.                                           cancelButtonTitle:@"Thanks!"
35.                                           otherButtonTitles:nil];
36.     [alert show];
37. }
38.
39. @end
```

```objc
 1. //
 2. //  AppDelegate.h
 3. //  NoNib
 4. //
 5. //  David J. Malan
 6. //  Harvard University
 7. //  malan@harvard.edu
 8. //
 9. //  Demonstrates a Single View Application with a view implemented without a nib (or storyboard).
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @class ViewController;
15.
16. @interface AppDelegate : UIResponder <UIApplicationDelegate>
17.
18. @property (strong, nonatomic) ViewController *viewController;
19. @property (strong, nonatomic) UIWindow *window;
20.
21. @end
```

```objc
1.  //
2.  //  AppDelegate.m
3.  //  NoNib
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application with a view implemented without a nib (or storyboard).
10. //
11.
12. #import "AppDelegate.h"
13. #import "ViewController.h"
14.
15. @implementation AppDelegate
16.
17. @synthesize viewController = _viewController;
18. @synthesize window = _window;
19.
20. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
21. {
22.     self.window = [[UIWindow alloc] initWithFrame:[[UIScreen mainScreen] bounds]];
23.     self.viewController = [[ViewController alloc] init];
24.     self.window.rootViewController = self.viewController;
25.     [self.window makeKeyAndVisible];
26.     return YES;
27. }
28.
29. @end
```

```objc
1.  //
2.  //  ViewController.h
3.  //  NoNib
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application with a view implemented without a nib (or storyboard).
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @interface ViewController : UIViewController
15.
16. @property (nonatomic, readwrite, strong) UITextField *textField;
17.
18. - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex;
19. - (void)go:(id)sender;
20.
21. @end
```

```objc
1.  //
2.  //  ViewController.m
3.  //  NoNib
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application with a view implemented without a nib (or storyboard).
10. //
11.
12. #import "ViewController.h"
13.
14.
15. @implementation ViewController
16.
17. @synthesize textField=_textField;
18.
19.
20. #pragma mark - UIViewController
21.
22. - (void)loadView
23. {
24.     // create view
25.     self.view = [[UIView alloc] initWithFrame:[UIScreen mainScreen].applicationFrame];
26.
27.     // create text field
28.     CGRect frame = CGRectMake(20, 20, 280, 31);
29.     self.textField = [[UITextField alloc] initWithFrame:frame];
30.     self.textField.autocapitalizationType = UITextAutocapitalizationTypeWords;
31.     self.textField.autocorrectionType = UITextAutocorrectionTypeNo;
32.     self.textField.borderStyle = UITextBorderStyleRoundedRect;
33.     self.textField.contentVerticalAlignment = UIControlContentVerticalAlignmentCenter;
34.     self.textField.font = [UIFont systemFontOfSize:[UIFont systemFontSize]];
35.     self.textField.placeholder = @"Name";
36.     self.textField.returnKeyType = UIReturnKeyGo;
37.
38.     // listen for Did End on Exit
39.     [self.textField addTarget:self action:@selector(go:) forControlEvents:UIControlEventEditingDidEndOnExit];
40.
41.     // add text field to view
42.     [self.view addSubview:self.textField];
43.
44.     // create button
45.     frame = CGRectMake(124, 59, 72, 37);
46.     UIButton *button = [UIButton buttonWithType:UIButtonTypeRoundedRect];
47.     button.frame = frame;
48.     [button setTitle:@"Go" forState:UIControlStateNormal];
```

```objc
49.
50.     // listen for Touch Up Inside
51.     [button addTarget:self action:@selector(go:) forControlEvents:UIControlEventTouchUpInside];
52.
53.     // add button to view
54.     [self.view addSubview:button];
55. }
56.
57. - (BOOL)shouldAutorotateToInterfaceOrientation:(UIInterfaceOrientation)interfaceOrientation
58. {
59.     return (interfaceOrientation == UIInterfaceOrientationPortrait);
60. }
61.
62.
63. #pragma mark - UIAlertViewDelegate
64.
65. - (void)alertView:(UIAlertView *)alertView didDismissWithButtonIndex:(NSInteger)buttonIndex
66. {
67.     // clear text field
68.     self.textField.text = nil;
69. }
70.
71.
72. #pragma mark - Actions
73.
74. - (void)go:(id)sender
75. {
76.     // hide keyboard
77.     [self.textField resignFirstResponder];
78.
79.     // show alert
80.     NSString *s = [NSString stringWithFormat:@"Hello, %@", self.textField.text];
81.     UIAlertView *alert = [[UIAlertView alloc] initWithTitle:@"Hello"
82.                                                     message:s
83.                                                    delegate:self
84.                                           cancelButtonTitle:@"Thanks!"
85.                                           otherButtonTitles:nil];
86.     [alert show];
87. }
88.
89.
90. @end
```

```objc
1.  //
2.  //  AppDelegate.h
3.  //  SingleView
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @class ViewController;
15.
16. @interface AppDelegate : UIResponder <UIApplicationDelegate>
17.
18. @property (strong, nonatomic) ViewController *viewController;
19. @property (strong, nonatomic) UIWindow *window;
20.
21. @end
```

```objc
1.  //
2.  //  AppDelegate.m
3.  //  SingleView
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application.
10. //
11.
12. #import "AppDelegate.h"
13. #import "ViewController.h"
14.
15. @implementation AppDelegate
16.
17. @synthesize viewController = _viewController;
18. @synthesize window = _window;
19.
20. - (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
21. {
22.     self.window = [[UIWindow alloc] initWithFrame:[[UIScreen mainScreen] bounds]];
23.     self.viewController = [[ViewController alloc] initWithNibName:@"ViewController" bundle:nil];
24.     self.window.rootViewController = self.viewController;
25.     [self.window makeKeyAndVisible];
26.     return YES;
27. }
28.
29. @end
```

```
1.  //
2.  //  ViewController.h
3.  //  SingleView
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application.
10. //
11.
12. #import <UIKit/UIKit.h>
13.
14. @interface ViewController : UIViewController
15. @end
```

```
1.  //
2.  //  ViewController.m
3.  //  SingleView
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Demonstrates a Single View Application.
10. //
11.
12. #import "ViewController.h"
13.
14. @implementation ViewController
15.
16. - (BOOL)shouldAutorotateToInterfaceOrientation:(UIInterfaceOrientation)interfaceOrientation
17. {
18.     return (interfaceOrientation != UIInterfaceOrientationPortraitUpsideDown);
19. }
20.
21. @end
```

```objc
1.  //
2.  //  Student.h
3.  //  Students9
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Declares a student with convenience method.
10. //
11.
12. #import <Foundation/Foundation.h>
13.
14. @interface Student : NSObject {
15. }
16.
17. @property (assign, nonatomic, readwrite) int age;
18. @property (copy, nonatomic, readwrite) NSString *name;
19.
20. + (id)studentWithName:(NSString *)name andAge:(int)age;
21. - (id)initWithName:(NSString *)name andAge:(int)age;
22.
23. @end
```

```objc
1.  //
2.  //  Student.m
3.  //  Students9
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Defines a student with convenience method.
10. //
11.
12. #import "Student.h"
13.
14. @implementation Student
15.
16. @synthesize age=_age;
17. @synthesize name=_name;
18.
19. + (id)studentWithName:(NSString *)name andAge:(int)age
20. {
21.     return [[Student alloc] initWithName:name andAge:age];
22. }
23.
24. - (id)init
25. {
26.     self = [self initWithName:@"John" andAge:403];
27.     return self;
28. }
29.
30. - (id)initWithName:(NSString *)name andAge:(int)age
31. {
32.     if (self = [super init])
33.     {
34.         self.age = age;
35.         self.name = name;
36.     }
37.     return self;
38. }
39.
40. @end
```

```objc
 1. //
 2. //  Student.h
 3. //  Students10
 4. //
 5. //  David J. Malan
 6. //  Harvard University
 7. //  malan@harvard.edu
 8. //
 9. //  Declares a student with (non-init) instance method.
10. //
11.
12. #import <Foundation/Foundation.h>
13.
14. @interface Student : NSObject {
15. }
16.
17. @property (assign, nonatomic, readwrite) int age;
18. @property (copy, nonatomic, readwrite) NSString *name;
19.
20. - (id)initWithName:(NSString *)name andAge:(int)age;
21. - (void)greet;
22.
23. @end
```

```objc
1.  //
2.  //  Student.m
3.  //  Students9
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Defines a student with (non-init) instance method.
10. //
11.
12. #import "Student.h"
13.
14. @implementation Student
15.
16. @synthesize age=_age;
17. @synthesize name=_name;
18.
19. - (id)init
20. {
21.     self = [self initWithName:@"John" andAge:403];
22.     return self;
23. }
24.
25. - (id)initWithName:(NSString *)name andAge:(int)age
26. {
27.     if ((self = [super init]))
28.     {
29.         self.age = age;
30.         self.name = name;
31.     }
32.     return self;
33. }
34.
35. - (void)greet
36. {
37.      NSLog(@"Hello, I am %@.  I am %d years old.\n", _name, _age);
38. }
39.
40. @end
```

```c
1.   //
2.   //  main.c
3.   //  SwapFailure
4.   //
5.   //  David J. Malan
6.   //  Harvard University
7.   //  malan@harvard.edu
8.   //
9.   //  Fails to swap two variables' values.
10.  //
11.
12.  #include <stdio.h>
13.
14.  // function prototype
15.  void swap(int a, int b);
16.
17.
18.  int main(int argc, const char * argv[])
19.  {
20.      int x = 0;
21.      int y = 1;
22.
23.      printf("x is %d\n", x);
24.      printf("y is %d\n", y);
25.      printf("Swapping x and y...\n");
26.      swap(x, y);
27.      printf("Failure!\n");
28.      printf("x is %d\n", x);
29.      printf("y is %d\n", y);
30.
31.      return 0;
32.  }
33.
34.
35.  //
36.  // Swaps arguments' values.
37.  //
38.
39.  void swap(int a, int b)
40.  {
41.      int tmp = a;
42.      a = b;
43.      b = tmp;
44.  }
```

```c
1.  //
2.  //  main.c
3.  //  SwapSuccess
4.  //
5.  //  David J. Malan
6.  //  Harvard University
7.  //  malan@harvard.edu
8.  //
9.  //  Swaps two variables' values.
10. //
11.
12. #include <stdio.h>
13.
14. // function prototype
15. void swap(int *a, int *b);
16.
17.
18. int main(int argc, const char * argv[])
19. {
20.     int x = 0;
21.     int y = 1;
22.
23.     printf("x is %d\n", x);
24.     printf("y is %d\n", y);
25.     printf("Swapping x and y...\n");
26.     swap(&x, &y);
27.     printf("Success!\n");
28.     printf("x is %d\n", x);
29.     printf("y is %d\n", y);
30.
31.     return 0;
32. }
33.
34.
35. //
36. // Swaps arguments' values.
37. //
38.
39. void swap(int *a, int *b)
40. {
41.     int tmp = *a;
42.     *a = *b;
43.     *b = tmp;
44. }
```