IOS - AUTO LAYOUTS

Auto-layouts were introduced in **iOS 6.0.** When we use auto-layouts, our deployment target should be 6.0 and higher. Auto-layouts help us create interfaces that can be used for multiple orientations and multiple devices.

Goal of Our Example

We will add two buttons that will be placed in a certain distance from the center of the screen. We will also try to add a resizable text field that will be placed from a certain distance from above the buttons.

Our Approach

We will add a text field and two buttons in the code along with their constraints. The constraints of each UI Elements will be created and added to the super view. We will have to disable auto-resizing for each of the UI elements we add in order to get the desired result.

Steps Involved

Step 1. Create a simple view-based application.

Step 2. We will edit only ViewController.m and it is as follows −

```
#import "ViewController.h"
@interface ViewController ()
@property (nonatomic, strong) UIButton *leftButton;
@property (nonatomic, strong) UIButton *rightButton;
@property (nonatomic, strong) UITextField *textfield;

@end
@implementation ViewController

- (void)viewDidLoad{
    [super viewDidLoad];
    UIView *superview = self.view;
    /*1. Create leftButton and add to our view*/
    self.leftButton = [UIButton buttonWithType:UIButtonTypeRoundedRect];
    self.leftButton.translatesAutoresizingMaskIntoConstraints = NO;
    [self.leftButton setTitle:@"LeftButton" forState:UIControlStateNormal];
    [self.view addSubview:self.leftButton];
    /* 2. Constraint to position LeftButton's X*/
    NSLayoutConstraint *leftButtonXConstraint = [NSLayoutConstraint
    constraintWithItem:self.leftButton attribute:NSLayoutAttributeCenterX
    relatedBy:NSLayoutRelationGreaterThanOrEqual toItem:superview attribute:
    NSLayoutAttributeCenterX multiplier:1.0 constant:-60.0f];
    /* 3. Constraint to position LeftButton's Y*/
    NSLayoutConstraint *leftButtonYConstraint = [NSLayoutConstraint
    constraintWithItem:self.leftButton attribute:NSLayoutAttributeCenterY
    relatedBy:NSLayoutRelationEqual toItem:superview attribute:
    NSLayoutAttributeCenterY multiplier:1.0f constant:0.0f];
    /* 4. Add the constraints to button's superview*/
    [superview addConstraints:@[ leftButtonXConstraint,
    leftButtonYConstraint]];
    /*5. Create rightButton and add to our view*/
    self.rightButton = [UIButton buttonWithType:UIButtonTypeRoundedRect];
    self.rightButton.translatesAutoresizingMaskIntoConstraints = NO;
    [self.rightButton setTitle:@"RightButton" forState:UIControlStateNormal];
    [self.view addSubview:self.rightButton];
    /*6. Constraint to position RightButton's X*/
    NSLayoutConstraint *rightButtonXConstraint = [NSLayoutConstraint
    constraintWithItem:self.rightButton attribute:NSLayoutAttributeCenterX
    relatedBy:NSLayoutRelationGreaterThanOrEqual toItem:superview attribute:
    NSLayoutAttributeCenterX multiplier:1.0 constant:60.0f];
```

```
    /*7. Constraint to position RightButton's Y*/
    rightButtonXConstraint.priority = UILayoutPriorityDefaultHigh;
    NSLayoutConstraint *centerYMyConstraint = [NSLayoutConstraint
    constraintWithItem:self.rightButton attribute:NSLayoutAttributeCenterY
    relatedBy:NSLayoutRelationGreaterThanOrEqual toItem:superview attribute:
    NSLayoutAttributeCenterY multiplier:1.0f constant:0.0f];
    [superview addConstraints:@[centerYMyConstraint,
    rightButtonXConstraint]];
   //8. Add Text field
    self.textfield = [[UITextField alloc]initWithFrame:
    CGRectMake(0, 100, 100, 30)];
    self.textfield.borderStyle = UITextBorderStyleRoundedRect;
    self.textfield.translatesAutoresizingMaskIntoConstraints = NO;
    [self.view addSubview:self.textfield];
    //9. Text field Constraints
    NSLayoutConstraint *textFieldTopConstraint = [NSLayoutConstraint
    constraintWithItem:self.textfield attribute:NSLayoutAttributeTop
    relatedBy:NSLayoutRelationGreaterThanOrEqual toItem:superview
    attribute:NSLayoutAttributeTop multiplier:1.0 constant:60.0f];
    NSLayoutConstraint *textFieldBottomConstraint = [NSLayoutConstraint
    constraintWithItem:self.textfield attribute:NSLayoutAttributeTop
    relatedBy:NSLayoutRelationGreaterThanOrEqual toItem:self.rightButton
    attribute:NSLayoutAttributeTop multiplier:0.8 constant:-60.0f];
    NSLayoutConstraint *textFieldLeftConstraint = [NSLayoutConstraint
    constraintWithItem:self.textfield attribute:NSLayoutAttributeLeft
    relatedBy:NSLayoutRelationEqual toItem:superview attribute:
    NSLayoutAttributeLeft multiplier:1.0 constant:30.0f];
    NSLayoutConstraint *textFieldRightConstraint = [NSLayoutConstraint
    constraintWithItem:self.textfield attribute:NSLayoutAttributeRight
    relatedBy:NSLayoutRelationEqual toItem:superview attribute:
    NSLayoutAttributeRight multiplier:1.0 constant:-30.0f];
    [superview addConstraints:@[textFieldBottomConstraint ,
    textFieldLeftConstraint, textFieldRightConstraint,
    textFieldTopConstraint]];
}
- (void)didReceiveMemoryWarning
{
    [super didReceiveMemoryWarning];
    // Dispose of any resources that can be recreated.
}
@end
```

Points to Note

In steps marked 1, 5, and 8, we just programmatically added two buttons and a text field respectively.

In the rest of the steps, we created constraints and added those constraints to the respective super views, which are actually self-views. The constraints of one of the left buttons is as shown below −

```
NSLayoutConstraint *leftButtonXConstraint = [NSLayoutConstraint
constraintWithItem:self.leftButton attribute:NSLayoutAttributeCenterX
relatedBy:NSLayoutRelationGreaterThanOrEqual toItem:superview attribute:
NSLayoutAttributeCenterX multiplier:1.0 constant:-60.0f];
```

We have constraintWithItem and toItem which decide between which UI elements we are creating the constraint. The attribute decides on what basis the two elements are linked together. "relatedBy" decides how much effect the attributes have between the elements. Multiplier is the multiplication factor and constant will be added to the multipler.

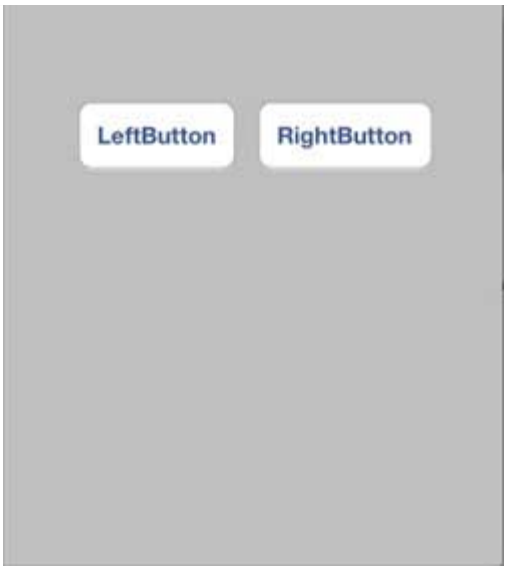
In the above example, the X of leftButton is always greater than or equal to -60 pixels with respect to the center of the super view. Similarly, other constraints are defined.

Output

When we run the application, we'll get the following output on the iPhone simulator −

When we change the orientation of the simulator to landscape, we will get the following output −

When we run the same application on iPhone 5 simulator, we will get the following output −



When we change the orientation of the simulator to landscape, we will get the following output −