**Challenge 1**

Base on the requirements, there are my solution to solve it.

1. **CRUD**

Create Asp.Net MVC Application support basic CRUD with Entity Framework. I also use Jquery and Ajax to create and append data.

1. **Validate long url**

It is easy to solve by using RegularExpressionAttribute. I wrote a custom attribute called DomainAttribute and get the regex pattern in web config so we can change it easier.

1. **Generate unique url**

The helper method to generate unique string is using RNGCryptoServiceProvider. I just follow this article <http://www.codeproject.com/Articles/14403/Generating-Unique-Keys-in-Net>. They said “They created 1,000,000 unique keys by using RNGCryptoServiceProvider and Character Masking and no duplicate keys”.