Dependency Injection using Ninject in ASP.NET MVC

What is Dependency Injection?
In software engineering, dependency injection is a software design pattern that implements inversion of control for resolving dependencies. – Wikipedia. It makes software components are loosely coupled.

Advantages of Dependency Injection

- Flexibility to use alternative implementation of service.
- Configurable & easy to use
- Make system loosely couple
- Code becomes more reusable, testable, readable and manageable.
- Reduction of boilerplate code in the application objects

What is Ninject?

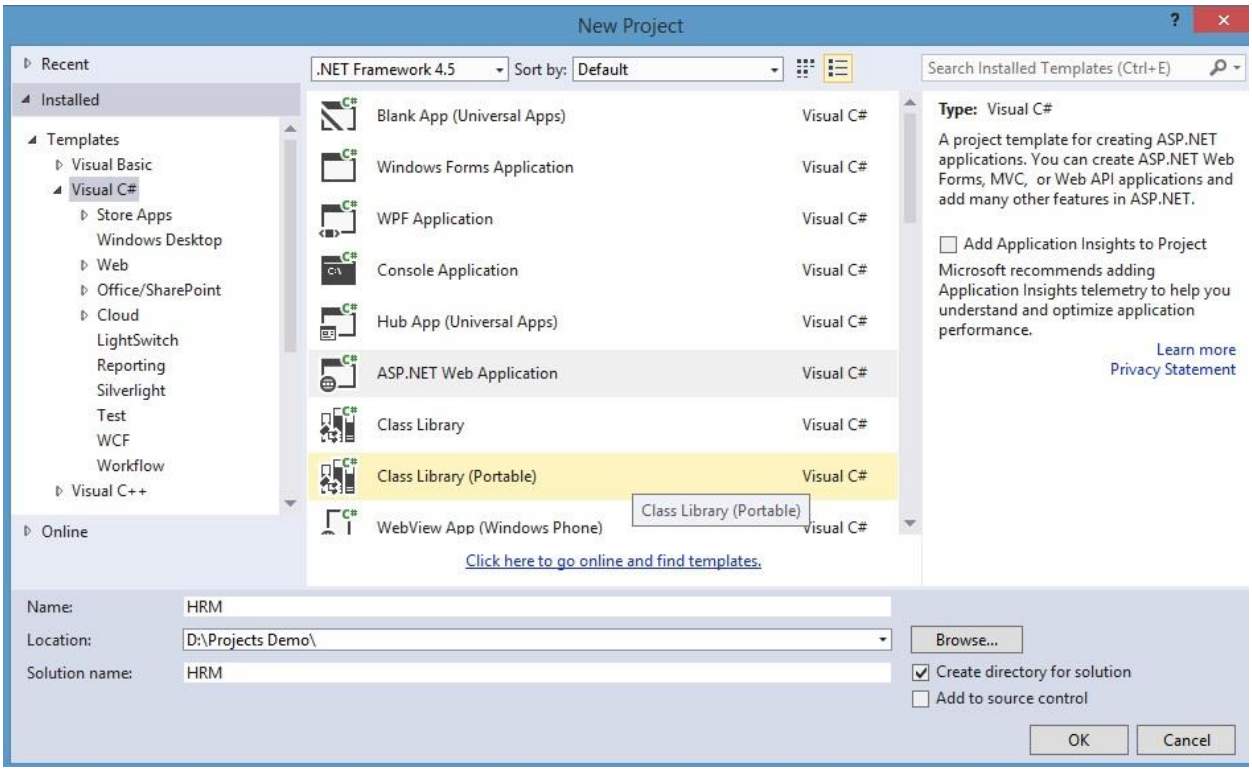
- Open Source Inversion of Control (IOC)
- It is a Dependency Injector for .NET created by Nate Kohari
- It's very easy to use.
- Easily add from nuget.
- For more information visit Ninject.org

Let's come to the implementation of DI using Ninject in ASP.NET MVC

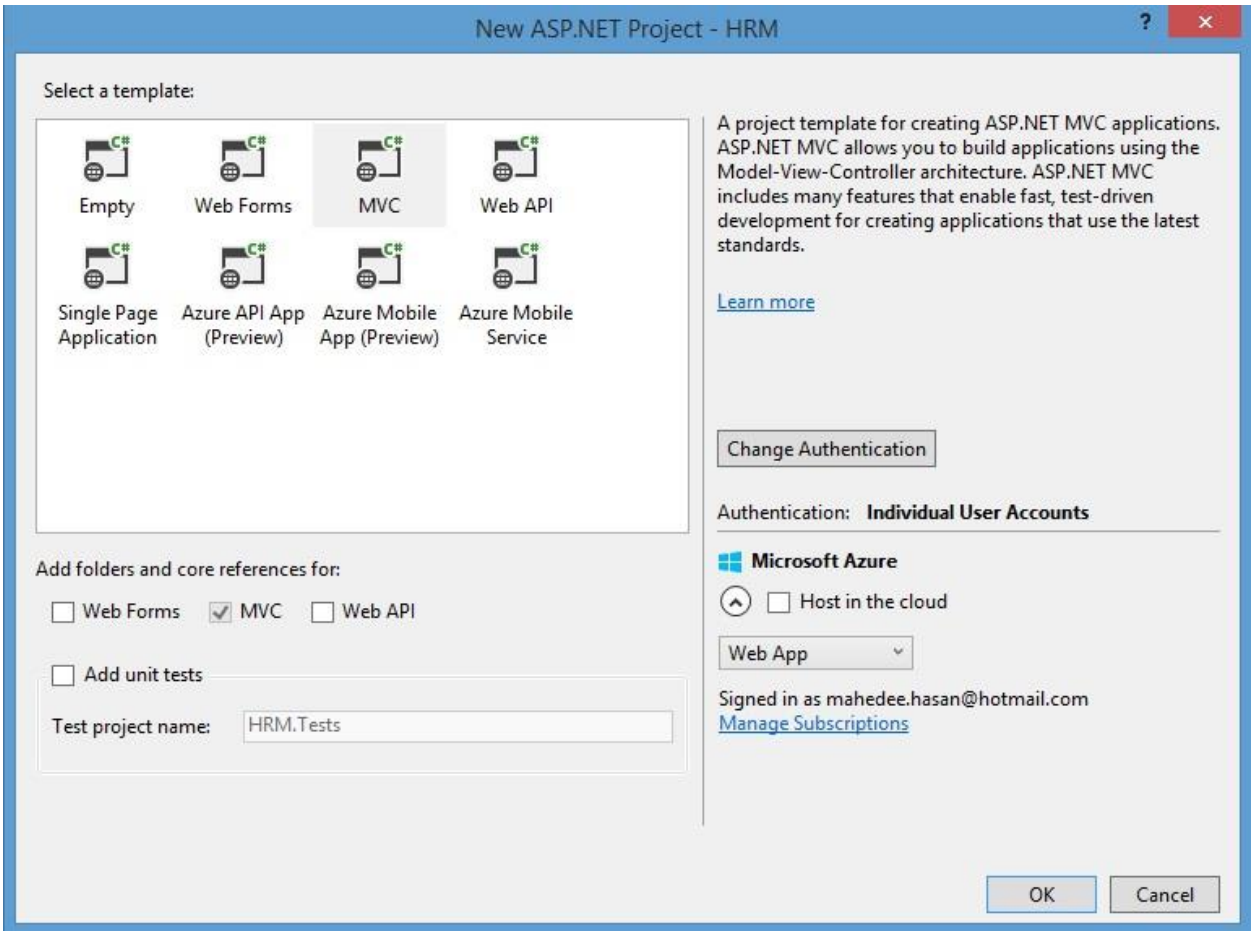
Tools and Technology used
I used following tools and technology to develop the project –

1. Visual Studio 2013
2. Visual C#
3. ASP.NET MVC 5
4. Entity Framework 6
5. Razor view engine
6. Ninject for MVC5

Step 1: Create a ASP.net MVC Project
From Visual studio 2013, choose File->Project as below



Select MVC Template and click OK



Step 2: Create a model name Employee

Create a Model name Employee in model folder

```
    public class Employee
    {
        public int Id { get; set; }
        public string Name { get; set; }
        public string Designation { get; set; }
        public string Dept { get; set; }
        public string BloodGroup { get; set; }
    }
```

Step 3: Change or Add Connection String

Change or Add connection string in Web.config

```
    <add name="DefaultConnection" connectionString="Data
Source=(LocalDb)\v11.0;AttachDbFilename=|DataDirectory|\HRMDB.mdf;Initial
Catalog=HRMDB;Integrated Security=True"
      providerName="System.Data.SqlClient" />
```

Step 4: Create a Context class

Create HRMContext Class in Repository folder.

```
public class HRMContext : DbContext
{
    public HRMContext()
        : base("DefaultConnection")
    {
    }
    public DbSet<Employee> Employees { get; set; }
}
```

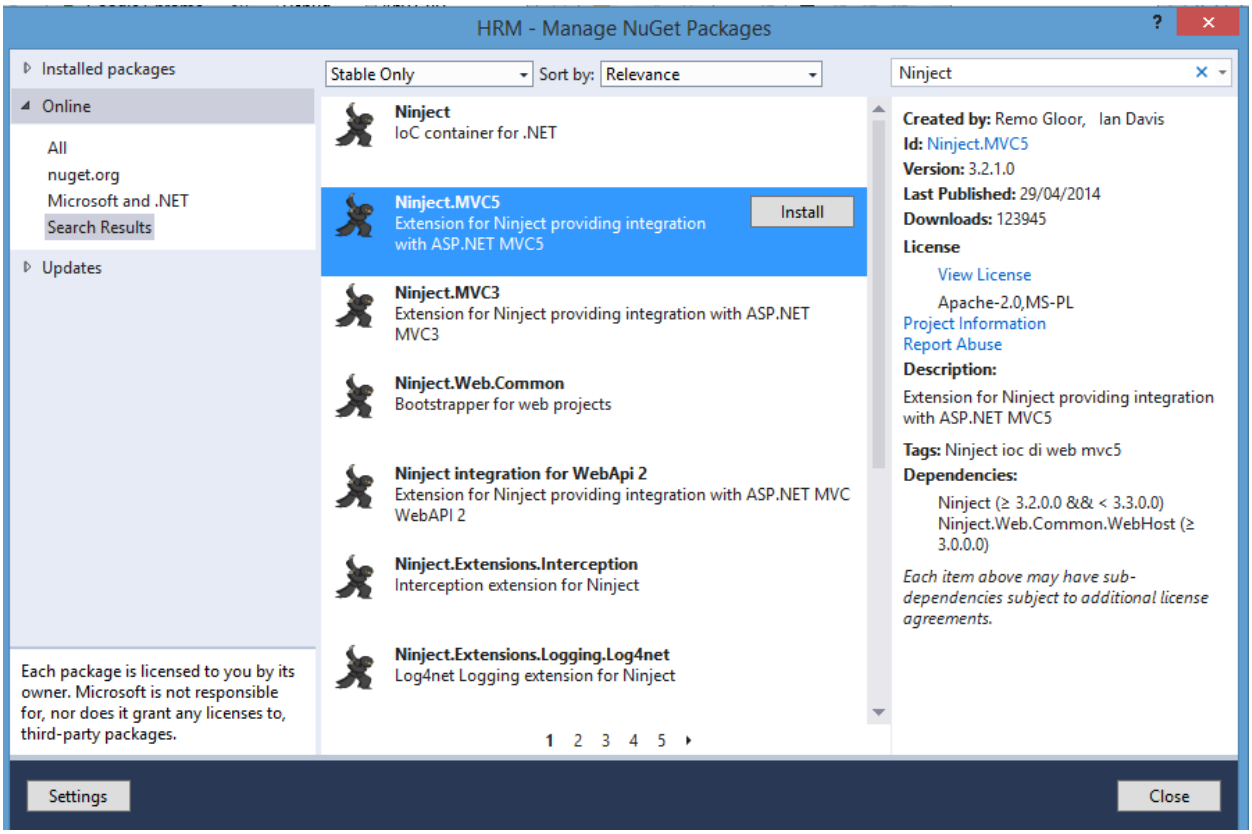
Step 5: Create Repository Interface and Concrete Class

Create IEmployeeRepository Interface and EmployeeRepository class in Repository folder

```
public interface IEmployeeRepository : IDisposable
{
    IQueryable<Employee> All { get; }
    Employee Find(int? id);
    void InsertOrUpdate(Employee employee);
    void Delete(int id);
    void Save();
}


public class EmployeeRepository : IEmployeeRepository
{

    HRMContext context;
    public EmployeeRepository(HRMContext context)
    {
        this.context = context;
    }

    public IQueryable<Employee> All
    {
        get { return context.Employees; }
    }

    public Employee Find(int? id)
    {
        Employee objEmployee = new Employee();
        objEmployee = context.Employees.Where(p => p.Id == id).FirstOrDefault();
        return objEmployee;
    }

    public void InsertOrUpdate(Employee employee)
    {
        if (employee.Id == default(int))
        {
            // New entity
            context.Employees.Add(employee);
        }
        else
        {
            // Existing entity
```

```
                context.Entry(employee).State = System.Data.Entity.EntityState.Modified;
            }
        }

        public void Delete(int id)
        {
            var employee = context.Employees.Find(id);
            context.Employees.Remove(employee);
        }

        public void Save()
        {
            context.SaveChanges();
        }

        public void Dispose()
        {
            context.Dispose();
        }
    }
```

Step 6: Install Ninject from nuget



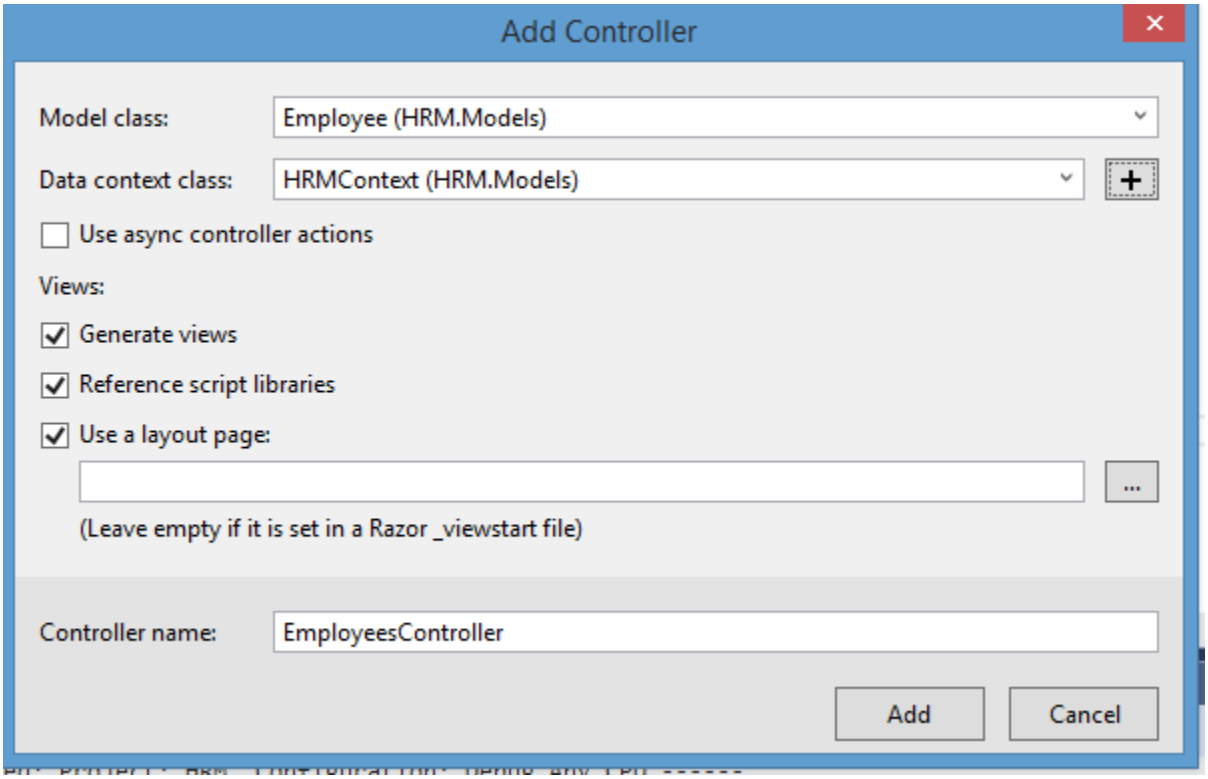
Step 7: Map Interface and Concrete class in Ninject

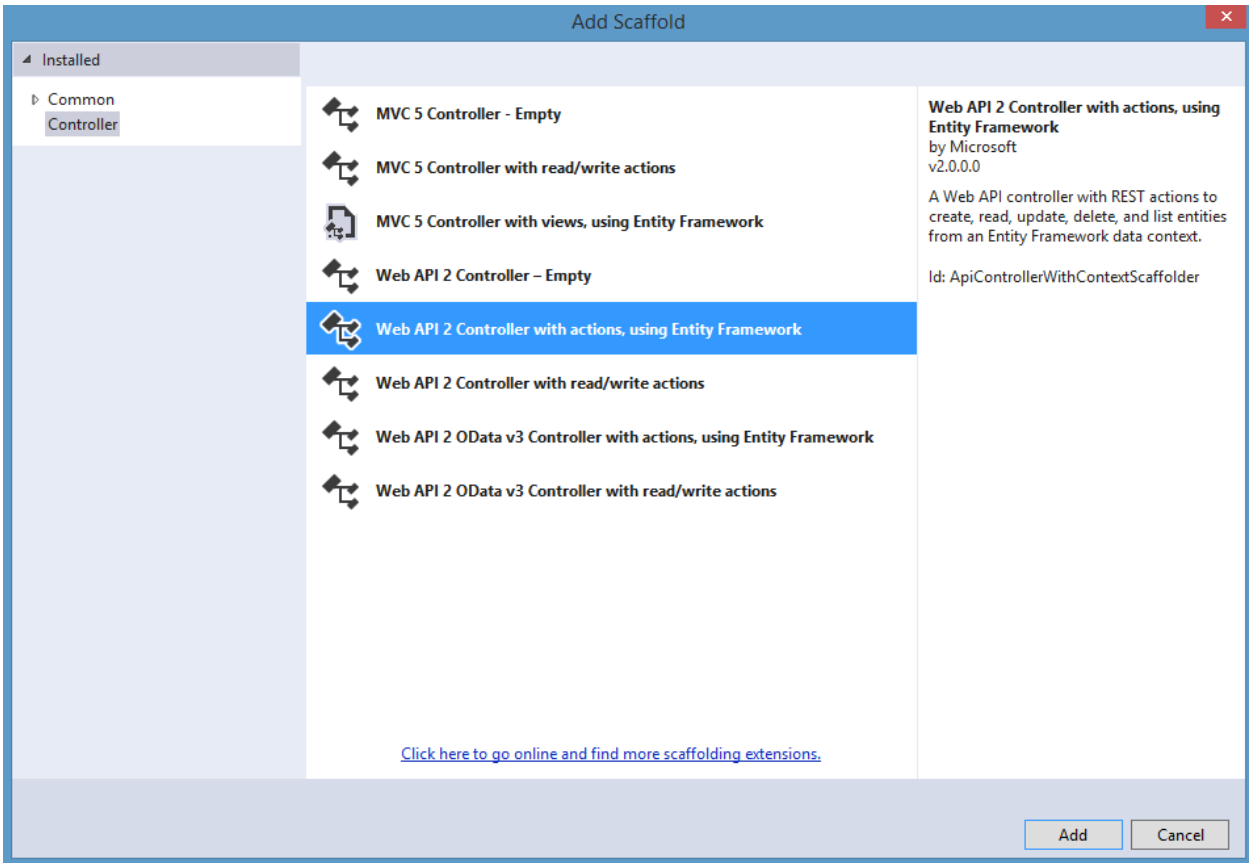
Go to NinjectWebCommon file in App_Start folder. Add the following line for IEmployee Interface and Employee concrete class.

```
public static class NinjectWebCommon
    {
        private static readonly Bootstrapper bootstrapper = new Bootstrapper();

        /// <summary>
        /// Starts the application
        /// </summary>
        public static void Start()
        {
            DynamicModuleUtility.RegisterModule(typeof(OnePerRequestHttpModule));
            DynamicModuleUtility.RegisterModule(typeof(NinjectHttpModule));
            bootstrapper.Initialize(CreateKernel);
        }

        /// <summary>
        /// Stops the application.
        /// </summary>
        public static void Stop()
        {
            bootstrapper.ShutDown();
        }

        /// <summary>
        /// Creates the kernel that will manage your application.
        /// </summary>
        /// <returns>The created kernel.</returns>
        private static IKernel CreateKernel()
        {
            var kernel = new StandardKernel();
            try
            {
                kernel.Bind<Func<IKernel>>().ToMethod(ctx => () => new
Bootstrapper().Kernel);
                kernel.Bind<IHttpModule>().To<HttpApplicationInitializationHttpModule>();

                kernel.Bind<IEmployeeRepository>().To<EmployeeRepository>();

                RegisterServices(kernel);
                return kernel;
            }
            catch
            {
                kernel.Dispose();
                throw;
            }
        }

        /// <summary>
        /// Load your modules or register your services here!
        /// </summary>
        /// <param name="kernel">The kernel.</param>
        private static void RegisterServices(IKernel kernel)
        {
        }
    }
```

Step 8: Create Controller and Views

Click Right button on Controller Folder->Add Controller. Choose its name as EmployeeController. Now choose scaffolding template for the controller as follows.





After clicking Add button, Employee Controller and Corresponding actions and views will be created automatically.

Step 9: Modify the controller

Modify the controller - use repository instead of context directly.

```
public class EmployeesController : Controller
{
    private readonly IEmployeeRepository repository;

    public EmployeesController(IEmployeeRepository objIrepository)
    {
        repository = objIrepository;
    }

    // GET: Employees
    public ActionResult Index()
    {
        return View(repository.All.ToList());
    }

    // GET: Employees/Details/5
    public ActionResult Details(int? id)
    {
```

```
            if (id == null)
            {
                return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
            }
            Employee employee = repository.Find(id);
            if (employee == null)
            {
                return HttpNotFound();
            }
            return View(employee);
        }

        // GET: Employees/Create
        public ActionResult Create()
        {
            return View();
        }

        // POST: Employees/Create
        // To protect from overposting attacks, please enable the specific properties you
want to bind to, for
        // more details see http://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
        public ActionResult Create([Bind(Include =
"Id,Name,Designation,Dept,BloodGroup")] Employee employee)
        {
            if (ModelState.IsValid)
            {
                repository.InsertOrUpdate(employee);
                repository.Save();
                return RedirectToAction("Index");
            }

            return View(employee);
        }

        // GET: Employees/Edit/5
        public ActionResult Edit(int? id)
        {
            if (id == null)
            {
                return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
            }
            Employee employee = repository.Find(id);
            if (employee == null)
            {
                return HttpNotFound();
            }
            return View(employee);
        }

        // POST: Employees/Edit/5
        // To protect from overposting attacks, please enable the specific properties you
want to bind to, for
        // more details see http://go.microsoft.com/fwlink/?LinkId=317598.
        [HttpPost]
        [ValidateAntiForgeryToken]
```

```
        public ActionResult Edit([Bind(Include = "Id,Name,Designation,Dept,BloodGroup")]
Employee employee)
        {
            if (ModelState.IsValid)
            {
                repository.InsertOrUpdate(employee);
                repository.Save();
                return RedirectToAction("Index");
            }
            return View(employee);
        }

        // GET: Employees/Delete/5
        public ActionResult Delete(int? id)
        {
            if (id == null)
            {
                return new HttpStatusCodeResult(HttpStatusCode.BadRequest);
            }
            Employee employee = repository.Find(id);
            if (employee == null)
            {
                return HttpNotFound();
            }
            return View(employee);
        }

        // POST: Employees/Delete/5
        [HttpPost, ActionName("Delete")]
        [ValidateAntiForgeryToken]
        public ActionResult DeleteConfirmed(int id)
        {
            repository.Delete(id);
            repository.Save();
            return RedirectToAction("Index");
        }

        protected override void Dispose(bool disposing)
        {
            if (disposing)
            {
                repository.Dispose();
            }
            base.Dispose(disposing);
        }
    }
```

Step 10: Run command in Package Manager Console

To find Package manager console go to

Tool->NuGet Package Manager -> Package Manager Console

Now, build the application and run the following command one by one in Package Manager Console.

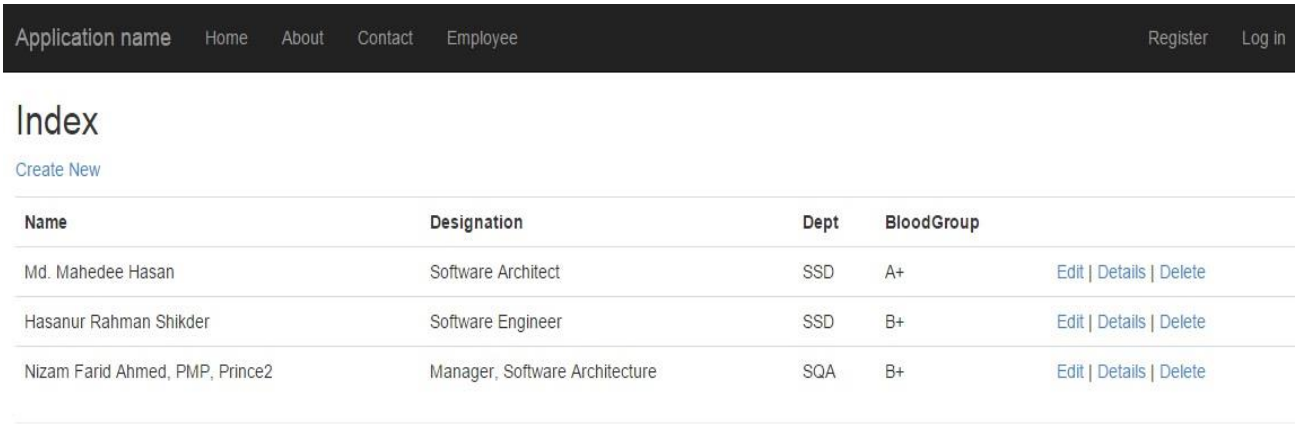
```
PM> Enable-Migrations -ContextTypeName HRMContext
PM> Add-Migration initialmigration
PM> Update-Database -Verbose
```

Step 10: Add a menu

Add a menu name employee in _Layout.cshtml page to create a menu.

```
<ul class="nav navbar-nav">
    <li>@Html.ActionLink("Home", "Index", "Home")</li>
    <li>@Html.ActionLink("About", "About", "Home")</li>
    <li>@Html.ActionLink("Contact", "Contact", "Home")</li>
    <li>@Html.ActionLink("Employee", "Index", "Employees")</li>
</ul>
```

Run the application and click "Employee" menu. Now you can create, delete, read update employee information.



References:

- http://www.codeproject.com/Articles/412383/Dependency-Injection-in-asp-net-mvc-and-webapi-us
- https://en.wikipedia.org/wiki/Dependency_injection