

Introduction

The purpose of the research phase is to introduce the class to technologies that are used in development companies today. This year, Envoc will be sponsoring CMPS 383, and will be the client that you will be delivering your final product to. Their team consists of Brandon Cornett and Kyle Joiner. They can be reached at 383@envoc.com.

Each team will give a 10-15 minute presentation at the end of this phase on the topic they are assigned, sharing what they have learned with the class.

SQL Queries

You will be writing your queries against the Northwind database, hosted by Envoc. The database can be accessed using the “SQL Management Studio” program using the following host: “hammond.envoc.com,9079”

Learn, describe, and give examples of the following general statements:

- SELECT
- INSERT
- UPDATE
- DELETE

Learn, describe, and show examples of:

- A JOIN of two or more tables. Briefly describe the difference between an INNER and OUTER JOIN as well as LEFT and RIGHT JOIN
- The WHERE clause and it’s usage
- ORDER BY syntax and usage
- GROUP BY syntax, limitations, and how it can be used with AVG, MAX, and MIN
- How to use “BEGIN TRANSACTION” and describe transactional safety

Learn, describe, and show use cases + examples for:

- Stored Procedures (SPs)
- User defined functions (UDFs)
- Views

Describe briefly what sql deadlocks are and how to avoid them

- Hint: “WITH(NOLOCK)” is 99% of the time the wrong answer, why?

Git

Describe what git is, how it is used, and how it differs from SVN

Learn and describe the following:

- What is git? Give us a brief history on it.
- What are the differences between git and SVN?
- What is the purpose of the .gitignore file?
- Explain the following commands:
 - Commit
 - Push
 - Pull
 - Merge
 - Rebase
 - Fetch
- What is the stash, and how is it used?
- What GUI programs are available for Windows? Mac?
- What repository providers are available online?
- What are best practices for branching when developing several features at once?
- What is and how do you make a pull request?

Give an example of how to:

- Fork a public, open-source, project for your use
- Merge an update to that project into your fork
- Creating and merging a pull request into a repository

jQuery / Angular

It will be your goal to learn what jQuery is, how it is used, and why it is essential to web development. In addition, provide a quick overview of frameworks such as Angular.

Learn and describe the following:

- What is jQuery?
- What is its role in web development?
- What is the ready function used for?
- How are elements to be manipulated on the page selected? What selectors are available?
- Go over the different event, CSS manipulation, effect, etc. methods available?
- What alternatives are there?
- What is Angular?
- What other frameworks are there like Angular?

- Why would you use Angular?
- Show a basic example of Angular in action

ASP.NET MVC

Describe the theory behind MVC architecture as a whole.
Tell us what it is and why it's useful.

At minimum, describe and give examples of the following:

- Controllers
- Actions
- Views
- Models

Provide information / example of:

- How ASP.NET MVC lives on a `HttpApplication` lifecycle in ASP.NET
- How users can be authenticated in an ASP.NET MVC application – provide at least two types with examples

Razor Engine / HTML / JavaScript / CSS

- Explain what the Razor Engine is and how it is used in Microsoft's ASP.NET MVC
- Describe HTML and CSS, what they are, and how they work together.
- Give examples of the different types of CSS selectors.
- How are JavaScript and CSS files included in a project and applied when rendering a web page?

At minimum, give examples of the following:

- Layouts and how they are used (HINT: `_ViewStart.cshtml` usage)
- Partial views
- `ViewBag`
- "Model" vs "model"
- Strongly typed views vs dynamic views
- A custom `Html` helper method to insert an image
- Bundling javascript / css files using the `Microsoft.AspNet.Web.Optimization` (or `System.Web.Optimization`) framework

Entity Framework

- What database technologies does Entity framework support?
- Show the difference between Database First and Code First.
 - Show examples of both
- What are “Migrations” and how do you set these up in EF Code First?
 - Provide instructions and an example

REST APIs

- What is an API?
- What is REST?
- What different formats are generally used to transfer data?
- Why are APIs useful?
- Show working examples of APIs.

Visual Studio

Show a solution with multiple projects, and explain why it might be useful to use more than one project.

- Show how you would reference code from one project in another.
- What is the Nuget package manager, and why is it useful?
- Show examples of using Nuget packages in your projects.
- What is Nuget package restore, and why would you use it?

Field Research

1. I will provide you with informal system requirements.
2. You are to interview the group from Envoc and ask them informally about what you will need for the project requirements for the first phase and to produce a Feasibility study to show me how viable this project is.
3. Go to the following sites for loads of information:
<http://www.asp.net/default.aspx?tabindex=0&tabid=1>
<http://api.jquery.com/>
<http://msdn.microsoft.com/vcsharp/>
<http://git-scm.com/>
<http://www.asp.net/mvc/mvc4>
<http://www.microsoft.com/sql/default.mspix>
<https://www.dreamspark.com/default.aspx>
<http://www.w3schools.com/>

Note: Obviously there are more sources available online and otherwise. It is the team leader's responsibility at this phase to ensure that enough research is made presented.