INF 354 - Semester Test

- **Multiple Choice**
  - True / False
- **No need to write a program from scratch**
  - Theory Questions (20 to 30 %)
  - Web stuff (PHP / HTML)
  - JSON vs XML - **23**
- **Coding questions**
    - Pseudo code
      - Make the code in any language
    - Convert code from one language to another, show differences
    - Why relational DB over non sql **17**
    - Advantage of code in one language over the other language
- **Scale a DB**
- **How does FB configure their Web server**
- **Here is code:**
  - Complete
  - Fix code
  - PHP **3**
  - What is php, tell tell signs <?php ?>
  - $ for variables
  - No data type
  - Client or server side (run it on both but mainly server)

  - **What is XAMMP**
    - Packaged software
    - Includes php, mysql, apache, tomcat
    - Other web services

- **Node js**
  - JS engine Google wrote
  - Scripting language
  - Took a client side to server side
  - Fast and quick to use
  - Var variable declaration
  - JQuery functions
  - Wrote our own web server in class
  - HTTP to run web server

- **BRD**
  - What to include in BRD
    - Overview
    - Into and background
    - Budget
    - Functional requirements
    - Risks
    - Investors

- **No SQL (Mongo)**
  - Shardding - splitting data up
  - Non-structured Structured
  - Data relates to data
  - JSON {"key": "value"}
  - Import and export query Mongo DB

```
C:\mongodb\bin\mongoimport --drop --db ip2location --collection db11
--type csv --file "C:\inetpub\wwwroot\TestMongoPHP\IP-COUNTRY-REGION-
```

```
CITY-LATITUDE-LONGITUDE-ZIPCODE-TIMEZONE.CSV" --fields
ip_from,ip_to,country_code,country_name,region_name,city_name,latitude
,longitude,zip_code,time_zone
```

Importing Information Into MongoDB

To learn how importing information into MongoDB works let's use a popular sample MongoDB database about restaurants. It's in .json format and can be downloaded using `wget` like this:

```
$ wget https://raw.githubusercontent.com/mongodb/docs-assets/primer-dataset/primer-data
```

Once the download completes you should have a file called `primer-dataset.json` (12 MB size) in the current directory. Let's import the data from this file into a new database called `newdb` and into a collection called `restaurants`. For importing we'll use the command `mongoimport` like this:

```
$ sudo mongoimport --db newdb --collection restaurants --file primer-dataset.json
```

Exporting Information From MongoDB

As we have previously mentioned, by exporting MongoDB information you can acquire a human readable text file with your data. By default, information is exported in json format but you can also export to csv (comma separated value).

To export information from MongoDB, use the command `mongoexport`. It allows you to export a very fine-grained export so that you can specify a database, a collection, a field, and even use a query for the export.

A simple `mongoexport` example would be to export the restaurants collection from the `newdb` database which we have previously imported. It can be done like this:

```
$ sudo mongoexport --db newdb -c restaurants --out newdbexport.json
```

In the above command, we use `--db` to specify the database, `-c` for the collection and `--out` for the file in which the data will be saved.

The output of a successful `mongoexport` should look like this:

- CRUD queries
- CSV (comma separated values)

- **WSDL**
  - What is a web service
  - Public available code that we can call on the internet via an end point (IP address)
  - SOAP (**Simple Object Access Protocol**)
  - XML Format (Parse XML)

- **Disadvantage**
  - If it goes down
  - You can use any languages to use this
  - Write a web service or method to add two numbers
  - webmethod(int a, int b)
    ```
    {
        if(b ==0)
            print (You dumbass);
        else
        {
            return a+b;
        }
    }
    ```
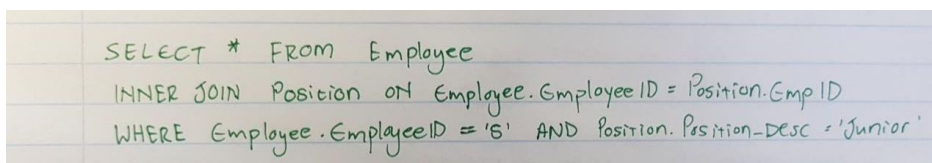
- **OO 5**
  - Object
  - Inheritance
    - What is the main purpose of making use of Inheritance when writing a C# object-orientated program? [2]
      - Inheritance allows reuse
      - Inheritance allows specialisation.
  - Polymorphism
  - Abstract class
  - Class
  - Interface

- **Entity Framework 7**
  - What is it and why you use
  - Object relation mapping ORM)
  - Map a source of data to a class visa versa
    - Problems
      - Learn a new framework
  - The architecture
    - Nicolais picture
  - Use LINQ to do queries
    ```
    var query =
        from b in db.Employee.Include(o => o.Position)
        where b.Position.Position_Desc == 'Junior' && b.Employee_ID == 5
        select b;
    ```



```
SELECT * FROM Employee
INNER JOIN Position ON Employee.EmployeeID = Position.EmpID
WHERE Employee.EmployeeID = '5' AND Position.Position-Desc = 'Junior'
```

- **JSON 22**
  - What are you lad
  - Build a JSON
  - What is JSON
  - Why is it better or difference between it and XML
  - What to do to change XML to JSON
  - Parse it to get data
  - I am dying slowly as I type it

AMAZON EC2 and S3

- **What is EC2?**

- is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.
- No but you get a 12 month of the service to try out
- An **EC2 instance** is a virtual server in Amazon's Elastic Compute Cloud (**EC2**) for running applications on the Amazon Web Services (AWS) infrastructure.

- **What is S3**
  - Amazon Simple Storage Service is storage for the Internet. It is designed to make web-scale computing easier for developers. Simple web service interface
  - A bucket is a resource which you can use Amazons S3 API to access it. A **bucket** is a logical unit of storage
  - Used to store objects - consist of data and metadata
  - **S3** server-side **encryption** uses one of the strongest block ciphers available, 256-bit Advanced **Encryption** Standard (AES-256). It is advised by Amazon that you use it to encrypt your objects

- **An Amazon Machine Image (AMI) provides the information required to launch an instance, which is a virtual server in the cloud**
  - Create: template for root volume > register AMI1 > launch instance and or copy AMI2

- **Vertically scaling** : Yes, by changing the instance type
  - Automatically grows or shrinks deepening on your use of the service

- **Mechanical turk**: is a crowdsourcing Internet marketplace enabling individuals and businesses (known as Requesters) to coordinate the use of human intelligence to perform tasks that computers are currently unable to do

- **Cloud**
  - **Hybrid cloud**: Hybrid cloud is a cloud computing environment which uses a mix of on-premises, private cloud and third-party, public cloud services with orchestration between the two platforms
  - **Elastic Cloud**: he degree to which a system is able to adapt to workload changes by provisioning and de-provisioning resources in an autonomic manner
  - **Amazon Cloud front**: is a global content delivery network (CDN) service that accelerates delivery of your websites, APIs, video content or other web assets through CDN caching.

- Classic and application Load Balancer

- **Scalability** adapts only to the "workload increase" by "provisioning" the resources in an "incremental" manner. **Elasticity**: **Elasticity** adapts to both the "workload increase" as well as "workload decrease" by "provisioning and deprovisioning" resources in an "autonomic" manner.

GitHub commands
- Check ref folder

Other Questions & Answers
1. PHP is a language primarily used in web development. HTML and CSS are executed?
   1.1. Client side

2. The server responsible for responding to http requests is known as a?
   2.1. Web server

3. _____ is an example of a web server?
   3.1. Apache, iis, nginx = All of them

4. A stored procedure returns?
   4.1. Single, Tabular and, no value = All of them

5.

```
public RoomList GetRooms()
{
    return this;
}
public RoomList GetRooms(int inID)
{
    RoomList temp = new RoomList(inID);
    return temp;
}
```

5.1. Overloading

6. Complete line [35] of the PHP code snippet [1]

```
1 <?php
2 $time = microtime();
3 $time = explode(' ', $time);
4 $time = $time[1] + $time[0];
5 $start = $time;
6 ?>
```

```
30 <?php
31 $time = microtime();
32 $time = explode(' ', $time);
33 $time = $time[1] + $time[0];
34 $finish = $time;
35 $total_time = $finish - $start 1 mark for $finish - $start
36 echo 'Page generated in '.$total_time.' seconds.';
?>
```

7. What is the advantage of having such a code snippet in your PHP script above?

   7.1. scripts load slow, measure delays such as writing/reading to/from files or MySQL database

8. Discuss the advantages of including stored procedures as part of your database design. [2]

   8.1. Any two of: better performance, higher productivity, ease of use (write once use many), and increased scalability, better memory management

9. Name and describe one major difference between a MongoDB database and a MS SQL Server database. [2]

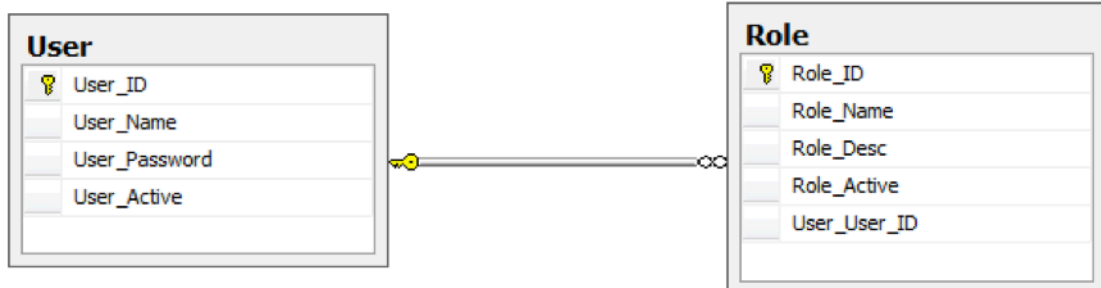   9.1. Document orientated: NoSql, list a description

   9.2. Relational: Give description

10. Multiple .dll (dynamic link library) with same name, how do we reference and resolve it

   10.1. Namespace

11.

Use the diagram below to complete the questions that follow:

User

🔑	User_ID
	User_Name
	User_Password
	User_Active

Role

🔑	Role_ID
	Role_Name
	Role_Desc
	Role_Active
	User_User_ID

11.1. Translate the following SQL statement to a LINQ or lambda statement (*Hint Lambda statements can be used within a LINQ statement): [5]

"SELECT * FROM User
 INNER JOIN Role ON User.User_ID=Role.User_User_ID
 WHERE User.User_ID='5' OR Role.Role_Desc='admin';"

11.1.1. "db is previously defined"

var query =
        from b in db.User.Include(o => o.Role)
        where b.Role.Role_Desc == 'admin' && b.User_ID == 5
        select b;

12. Write down the MongoDB JSON document structure that can represent the above relational database structure.

12.1. {

        User_ID: "1", User_Name: "Bob", User_Password "123RDXDS", User_Active: true,

            {

                User_User_ID "1", Role_**Name**: "admin", **Role_Desc**: "Full Access",**Role_ID**: "1", Role_Active: "true"

            }
            {

                User_User_ID "1", Role_**Name**: "clerk", **Role_Desc**: "View Access", **Role_ID**: "2", Role_Active: "false"

            }

    }