Engineer Assessment Test

1 SOLUTION BUILD

1. Pull down the git repo from here: https://github.com/AnsibleAus/Test2.git
2. The GIT repository is setup in a manner consistent with Gitflow.
3. Build a solution architecture in Visual Studio that contains a simple front end with a back-end REST api. It is up to you the technologies used.
4. Ensure that types returned by the back end serialize and de-serialize consistently between the front end and the api.
5. Code an api which implements the GET & POST for
    a. Single entity
    b. List of entities
6. Show how you might document the api to communicate it's structure for front-end development.
7. Check-in your code, check it in often, ensure you add comments to your checkins
8. Submit a Pull Request (aka merge request) for your feature branch

2 PROBLEM SOLVING

Print all numbers in the sequence 1 – 100 inclusive on a separate line.

If the number is divisible by 3 print " Ansible" next to the number, if the number is divisible by 5 print " Australia" next to the number, otherwise if the number is divisible by 3 and 5 print " Ansible Australia" next to the number.

Code unit tests to makes sure your routine satisfies all requirements.

3 DESIGN PATTERNS

Code examples of the following design patterns, answer the questions.

3.1 SINGLETON

How would you protect this pattern in a multi-threaded environment?

Describe a scenario where this pattern might not be a good idea.

3.2 COMMAND

Describe a scenario this pattern is useful in?

3.3 FAÇADE

Briefly explain how this pattern can help designing an API.

4 CONCEPTS

Briefly explain the following concepts:

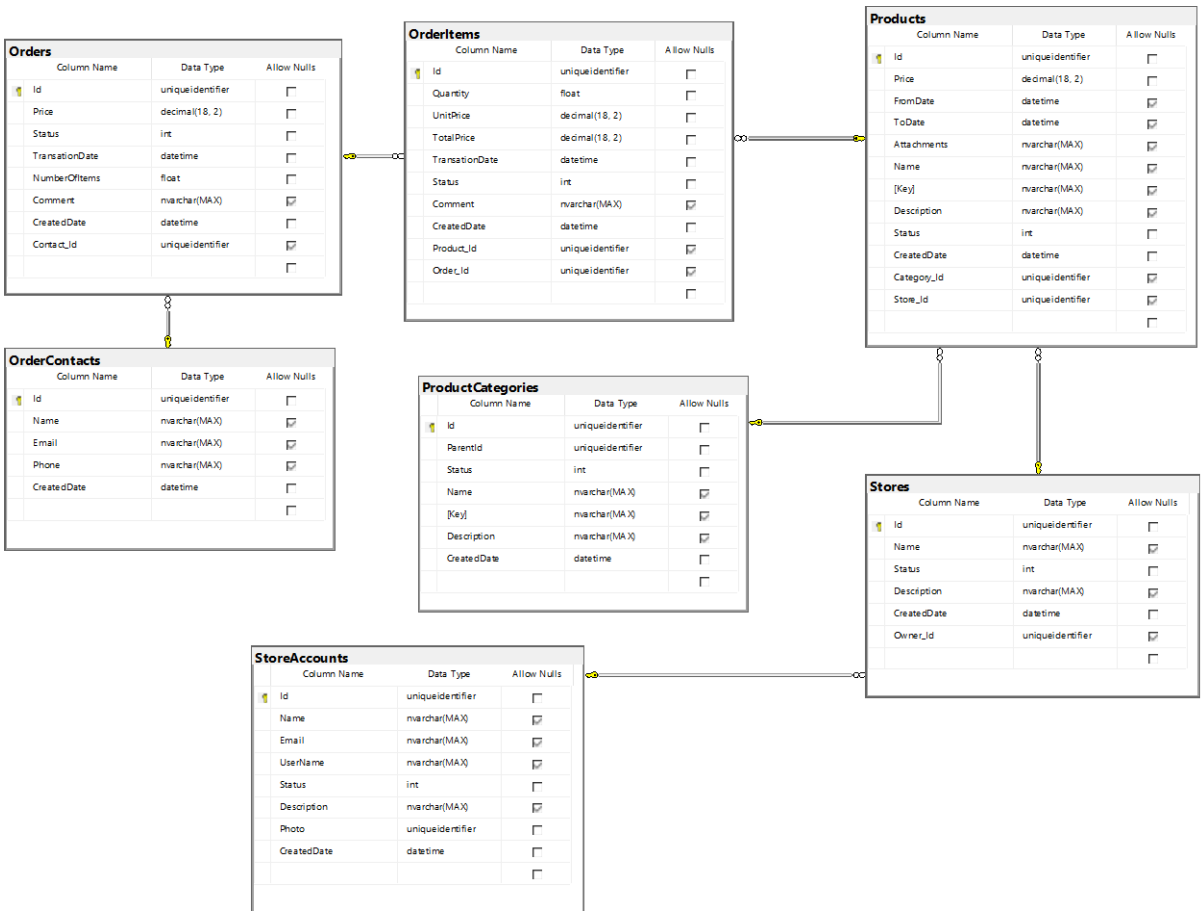
4.1 SEPARATION OF CONCERNS

4.2 INVERSION OF CONTROL

4.3 DEPENDENCY INJECTION

4.4 SINGLE RESPONSIBILITY PRINCIPLE

5 GIVEN THE FOLLOWING SCHEMA



5.1 GET THE DATA

Write the SQL to answer these questions.

What is the total price of all orders?

On average, how many products are sold per order?

Which order was the largest in terms of the unit price?

5.2 OPTIMISE

Suggest ways this schema could be optimised.

6 WHERE'S THE ERROR

Consider this c# code

6.1 WHAT IS WRONG HERE? HOW WOULD YOU FIX IT?

```
ICoreService _coreService;
public ICoreService GetCoreService
{
    get { return _coreService; }
}

protected ICoreService CoreService
{
    get { return _coreService; }
    set { _coreService = value; }
}
```

6.2 AND HERE?

```
private Contact _FirstEmergencyContact;
public Contact FirstEmergencyContact
{
    get { return _FirstEmergencyContact; }
    set { SetProperty(ref _FirstEmergencyContact, value); }
}


private Contact _SecondEmergencyContact;
public Contact SecondEmergencyContact
{
    get { return _SecondEmergencyContact; }
    set { SetProperty(ref _FirstEmergencyContact, value); }
}
```