



Galway-Mayo Institute of Technology
Semester 1 Examinations 2016/2017

MODULE: COMP07048 – Data Representation and Querying

PROGRAMME(S):

GA_KSOFGB07	B.Sc. Software Development
GA_KCDMG_H08	B.Sc. (Hons) Computing and Digital Media

YEAR(S) OF STUDY: 3, 4

EXAMINERS:

Dr Ian McLoughlin	(Internal)
Dr Martin Kenirons	(Internal)
Dr Des Chambers	(External)
Mr Tom Davis	(External)

TIME ALLOWED: 2 hours

INSTRUCTIONS: Answer 3 questions. All questions carry equal marks.

Please do not turn this page until you are instructed to do so.

The use of programmable or text storing calculators is expressly forbidden. Please note that where a candidate answers more than the required number of questions, the examiner will mark all questions attempted and then select the highest scoring ones.

There are no additional requirements for this paper.

Question 1

Discover Ireland is creating a web application called Landie for tourists visiting Ireland. Users of Landie will be able to share information about various landmarks around Ireland. Users will be able to view landmarks others have added, and will be able to add their own landmarks to let other users know about them. A HTTP API will also be provided so that developers can interact with the application programmatically.

- (a) Explain what a HTTP API is, using Landie as an example. (40 marks)
- (b) Explain the term REST, and how Landie could be designed to be RESTful. (40 marks)
- (c) Explain what is meant by the term stateless in the context of REST. (20 marks)

Question 2

You and a classmate decide to create a social network for third-level students called Stoup. Stoup will allow students to set up and join study groups with other like-minded students from different third-level institutes. Architecturally, Stoup will be an SPA.

- (a) Explain what it means for Stoup to be an SPA. (40 marks)
- (b) The following is some JavaScript code that your classmate has written for Stoup. Explain what it does and how it works.

```
1 var xmlhttp = new XMLHttpRequest();
2 xmlhttp.onreadystatechange = function() {
3     if (xmlhttp.readyState == 4) {
4         var userlistdiv = document.getElementById("userlist");
5         userlistdiv.innerHTML = xmlhttp.responseText;
6     }
7 };
8 xmlhttp.open("GET", "http://www.stoup.com/users");
9 xmlhttp.send();
```

(40 marks)

- (c) Explain what a callback function is in the context of AJAX. (20 marks)

Question 3

You have applied to the Apache Foundation for an internship to work on their CouchDB project. They have asked you to provide written answers to the following.

- (a) Explain how HTTP works, and how it is used in CouchDB. (40 marks)
- (b) Explain the difference between the GET and POST HTTP methods. Give an example of using each of these methods to interact with a CouchDB database. (40 marks)
- (c) Explain what the PATCH method does in HTTP. (20 marks)

Question 4

A clothing company called Irish Apparel have an online store. Users of the online store can add items to a virtual shopping basket. They can then go through the checkout process to purchase the items in their basket. A recent survey has determined that users find the site quite slow.

- (a) Explain what HTTP sessions are, and suggest a why an online clothing store like Irish Apparel would use them. (40 marks)
- (b) Explain the benefit of using an in-memory data structure store like Redis to store session information, using Irish Apparel's online store as an example. (40 marks)
- (c) The credit card details of Irish Apparel customers are saved by the online store so that they do not have to be entered the next time the customer visits. Suggest whether or not Redis would be a good solution to save credit card details for this purpose. (20 marks)