This test consists of two parts. Part 1, Developing a Web Application and Part 2, Technical Questions. You will have 3 hours to complete both parts.

**Part 1, Developing a Web Application (120 points)**

The general purpose of the web application is to process MS Word (docx) document using Lucene.NET and generate comments with number of occurrences for every paragraph appearing more than once.

**Functional requirements:**

* As a user I would like to upload MS Word (docx) file
* As a user I would like to have my file processed using Lucene.NET in a way that every paragraph repeated several times in the document gets a comment added to it with the number of occurrences.

**Technical requirements:**

* Use ASP.NET MVC (with C#) framework to create the web application
* Use Lucene.NET for full text indexing and searching
* Use OpenXML SDK for MS Word (docx) processing

**The application will be assessed based on the following criteria:**

* Each requirement will be scored based on completeness and correctness. Each requirement is worth 50 points, for a total of 100 points
* Organization of components – how well was the software designed according to object oriented design principles(DRY, SOLID), consistent naming conventions and aesthetics of application (10 points)
* Security – no login is required, however, there should not be any potential security flaws (10 points)

**Part 2, Technical Questions (80 points)**

1. When developing a web application that will be accessed by users in different locations/time zones, what considerations would you take when planning the application design and infrastructure? (20 points)

**Answer**:

Availability should be taken into consideration, as users will access the application at different times. Even more important is establish a consistent model to save Datetime variables, for example saving all times as Utc Datetime.

For countries using characters in the Unicode spectrum to display correctly web pages we should consider a page encoding appropriate, generally UTF-8.

For display Arabic right-to-left text probably a custom view is needed.

Chinese/Japanese can read up-to-down or left-to-right (even if they read the page last-to-first) so probably web page should stick with left-to-right.

1. Describe the most common security vulnerabilities to a web application and how you can prevent them (15 points)

The most common security threats in web application are: injection and cross-site scripting. SQL injection when threating untrusted data without decoding/parsing.

Cross Site Request Forgery can be mitigated adding random token to the request.

(3) Describe the most common approaches used for MS Word (docx) files processing (15 points)

(4) Describe multi-tenancy and how it could be useful for a project which is offering SaaS (Software as a Service) (20 points)

Multi-tenancy means using a single database for various installation. It can be useful in the sense that it limits the maintenance of different installations but limit the capability of customization.

(5) Have you ever used an ORM? If so, which one(s). Provide characteristics of the ORMS you have used. (e.g. benefits/disadvantages) (10 points)

I have used Entity Framework Code First. The advantage is a rapid life-cycle of changes, at the cost of less control over the queries. It accepts raw SQL or can execute custom store procesures though.

**Delivery Protocol:**

* Zip your solution and name the file firstname\_lastname.zip. For example, if your name is Mary Smith, the file should be named mary\_smith.zip
* In the zip file include a backup of any databases which might be needed
* Include answers to the five questions in the email
* **Please be sure to email whatever you have completed as soon as the allotted time is up.** You may continue to work afterwards and provide a more complete solution later. However, the work that was delivered at the deadline will be considered first.
* Upload the zip file(s) to the location specified in the email you received. **Please do not replace files which were already uploaded, as we will check the dates to ensure that they were delivered on time.** You can of course continue to upload files with another name.