**Overview:**

Our engineering teams operate in bar raising environments, and therefore any Lead Developer candidate, either Frontend or Backend, is required to complete the below exercise to demonstrate their skills operating in a similar space.

**Purpose of the Task:**

1 – Demonstrate of your command of written English language

2 – To understand your ability to design software applications

3 – Gauge your understanding of recent and appropriate technology choices

**Guide:**

We appreciate how busy life is, and we do not expect you to send back a 20-page document as that would be unreasonable! As a guide, we estimate that the task should take 2 hours max and should be 2-3 pages in length. Of course, if you wanted to add anything extra such as wireframe diagrams or similar feel free to do so, but this is not expected.

**\*\*Please ensure you return this test back to the Talent Partner you are working with prior to your interview\*\***

During your interview, you will have the opportunity to meet with a Lead Developer and a Solution Architect, where you will discuss your work in more detail.

**Architecture/Software Design Test**

A client requires a URL shortening service, but has rejected using commercial SaaS such as bit.ly or tiny.url for cost or data protection reasons.

The shortening service should support the following functionality:

* To shorten a URL, use a ?shorten query string; for example, <http://www.example.com/?shorten=http://some.url/etc/> will return a shortened URL <http://www.example.com/jhakdj>
* To expand a URL simply request the shortened URL e.g. [http://www.example.com/jhakdj](http://b.io/jhakdj) and the system will redirect to the expanded URL.
* To view the expanded URL without redirecting to it, simply add a + to the end of the URL, e.g. <http://www.example.com/xhgjgh+>

The development team who will build this system are experienced in Java; however other languages/frameworks would be considered with a suitable explanation/justification.

The system is expected to receive around 1 million hits each day, with peak traffic of 50 hits per second.

Ideally the ‘unique code’ part of the URL would be no longer than 6 characters long.

This is not a coding exercise. For this test, the candidate should produce a professional looking design document that is suitable to be shared with the development team, which includes (but isn’t limited to) information & reasoning about the following:

* Suggested high level classes
  + and/or software frameworks/libraries
  + and/or any software design pattern
* How the data would be persisted
* How the system could scale and balance load
* A description of the algorithm to convert from a long URL to a short code
* Suggested server(s)
* Approximate server/hardware/monthly costs if hosted by Amazon AWS or an alternative hosting company from which it is possible to get costs

As the candidate is unable to ask questions of a business analyst or the client, any significant questions or important assumptions should be documented.