INTELLICORE

Technical Skills Assessment

Laravel

03/08/2023

Contents

Document Control

Version

Author	Date	Detail	Version
Shaun Henderson	07/01/2022	Initial draft of 2022 technical assessment	V 1.0.0
Shaun Henderson	07/04/2022	Small amendments to intro and spec.	V 1.0.1
Shaun Henderson	26/06/2022	Update to the specification.	V 1.1.0
Shaun Henderson	22/03/2023	Update to the specification.	V 1.2.0
Shaun Henderson	24/03/2023	Add additional examples of invalid pins	V 1.2.1
Shaun Henderson	25/05/2023	Add clarity to the specification	V 1.3.0
Shaun Henderson	23/07/2023	Rewritten and restructured the assessment, providing a more directed assessment process.	V 2.0.0
Shaun Henderson	03/08/2023	Minor revisions based on internal feedback	V 2.0.1

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1 Introduction

As part of our assessment process, we present you with a hypothetical scope for the client, Acme Ltd, and their door access system. Your task is to develop a small composer package that meets the requirements outlined in the scope.

Upon successfully submitting your package and being invited to the follow-up interview, we will discuss your solution in detail. During this discussion, you'll have the opportunity to explain your thought process, the design choices you made, and why you implemented the solution in the way you did. The interview is not limited to seeing your code running; rather, it's a chance for you to articulate your ideas effectively and demonstrate a deep understanding of your work.

2 Your Approach

We believe Laravel is an excellent framework that offers multiple ways to tackle a problem. However, this flexibility can enable relatively inexperienced developers to produce functional yet sub-optimal solutions. We would like you to demonstrate how your Laravel aptitude gives you the ability to appropriately leverage some of the framework's more advanced capabilities, to creatively and efficiently develop an exceptional solution.

Use this technical assessment as an opportunity to showcase your unique approach to problem-solving. Differentiate yourself from other candidates by demonstrating a comprehensive understanding of Laravel, innovative thinking, and best practices in software development. This is your chance to shine and prove your expertise in building robust and elegant solutions.

To ensure the recruitment process maintains momentum, we offer a 7-day window from date of issue to complete the assessment. However we fully respect your time and appreciate that you will have your own personal commitments that will take priority. Should the default timeframe not be suitable for you, please let us know as soon as possible and we can tailor an alternative date to suit your individual circumstances.

Note: Please take the time to carefully read through the entire document to ensure you identify and understand all the requirements of the scope. It's essential to have a comprehensive understanding of the expectations before proceeding. If you have any questions or need clarification on any points, don't hesitate to reach out.

3 Assessment Constraints

The following constraints will be applied to the technical assessment, and must be adhered to;

Constraint	Additional Information
The package must be unit tested using PHPUnit	PHPUnit is a staple in several of our projects, so we ask that this be adhered to.
The use of a cache is not permitted	Although a cache may be part of a potential solution, for the purpose of this exercise it is not to be used.
Git source control must be utilised	Your approach to handling commits should be reflective of how you would do so in your normal day to day.
Documentation must be provided	Including readme, installation and usage instructions.

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4 Problem Statement

Over the last 6 months, Acme Ltd have identified 20 incidents of unauthorised entry into their warehouse. This has been flagged as a major failing due to Acme dealing with several sensitive contracts, in which they must adhere to strict security policies. Acme's warehouse has a single point of access through their main entrance. Traditionally, the Head of Manufacturing or Site Supervisor would unlock the door at the start of the day and lock it again at the end of the day; The main entrance remains open and unmanned during working hours.

As a result of a recent audit, Acme are now in the process of introducing a door access system; Where each member of their team will be issued a code that is unique to them. The main entrance will now be locked 24/7 and require a valid code to be entered in order to gain entry.

5 Solution Overview

Acme has tasked Intellicore with developing a package to generate secure credentials, primarily in the form of 6-digit codes for their door access system. However, Acme envisions future possibilities where the solution can be extended and reused for other use cases and formats. The goal is to create a versatile and adaptable solution that can be leveraged in various scenarios without starting from scratch each time.

To ensure the generated codes for the door access system are considered secure, Acme has provided specific rules that the solution must adhere to *(see requirements 007 to 010)*. However, these rules are not rigid and may undergo changes or have additional criteria incorporated. The solution should be designed with flexibility in mind, allowing easy configuration to accommodate any modifications in the secure code generation rules.

6 Considerations

Acme emphasises the importance of scalability in the solution. This scalability should apply not only to the different types of codes that can be generated but also to the potential adjustments in the criteria for generating secure codes for these various types. Although the immediate need is for 6-digit codes, the solution should be able to adapt to changes in code length or other code formats in the future.

Additionally, performance is a critical factor in both the implementation and usage of the solution. As the number of codes allocated increases, steps must be taken to ensure consistent and reliable performance. The solution should be optimised to avoid degradation in day-to-day performance.

7 Requirements

✓	Ref.	Requirement
	001	Each code must be unique
	002	Codes must be persisted
	003	A code can be allocated
	004	Codes must be allocated in a random order
	005	An allocated code can be "reset" and made available for reallocation
	006	A code must comprise of 6 numeric digits
	007	A code cannot be a palindrome
	008	For a 6-digit code, it cannot have a character repeated more than three times
	009	For a 6-digit code, it cannot have a sequence length of more than three
	010	For a 6-digit code, it must have at least three unique characters

8 Examples

8.1 Valid Examples

Provided below are examples of valid codes when the solution is configured to generate a 6-digit code.

✓	Example	Reason
	494263	n/a
	791268	n/a
	003548	n/a
	977320	n/a
	325671	n/a

8.2 Invalid Examples

Provided below are examples of invalid codes when the solution is configured to generate a 6-digit code.

✓	Example	Reason
	235532	Is a palindrome
	730037	Is a palindrome
	111135	Has a character repeated more than three times
	737797	Has a character repeated more than three times
	090300	Has a character repeated more than three times
	012386	Has a sequence length greater than three
	678931	Has a sequence length greater than three
	087653	Has a sequence length greater than three
	663633	Does not have at least three unique characters
	955959	Does not have at least three unique characters
	454545	Does not have at least three unique characters

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