**366695**

**Software Development Engineer in Test (SDET)**

**Coding Challenge**

**Please read the following:**

**For internal candidates: I understand my application may be rejected or I may be subject to disciplinary action if evidence of plagiarism is detected. Examples of plagiarism can include presenting the ideas and experience of others, or generated by artificial intelligence, as your own.**

**For external candidates: I understand that if evidence of plagiarism is found in my application it may be rejected. Examples of plagiarism can include presenting the ideas and experience of others, or generated by artificial intelligence, as your own.**

**Overview of the Exercise**

In this exercise you are required to present your solution to the panel.

You will be required to deliver your findings to the panel orally and by Screen Share to deliver your presentation.

**Background Information**

In the UK, a vehicle needs to be registered to be used on roads. This is known as the vehicle’s registration number. There are various rules that are applied to create unique registration numbers.

You have been given a dataset containing vehicles that are yet to be registered.

*Note: These rules are fictional and were created for the purpose of this exercise.*

**Vehicle Registration Number:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Area Code | |  | Age Identifier | |  | Random Letters | | |
| L | L |  | D | D |  | L | L | L |
| Letter | Letter | Whitespace | Digit | Digit | Whitespace | Letter | Letter | Letter |

Example registration number: CA 12 ABC

**Area Code:**

The area code is determined from a vehicle’s registration area. The following rules are used to determine the area code.

|  |  |  |  |
| --- | --- | --- | --- |
| **Registration Area** | **First letter** | **Second letter** | **Example** |
| Swansea | C | A ... K | CB |
| Cardiff | C | L ... Z | CM |
| Birmingham | B | A B C | BB |

**Age Identifier:**

The age identifier is determined from a vehicle’s date of manufacture.

|  |  |  |
| --- | --- | --- |
| **Date range** | **Rule** | **Example** |
| March - Aug | Year without century | 01-05-2024 = 24 |
| Sep - Feb | Year without century + 50 | 01-09-2024 = 74 |

**Random Letters:**

The following letters cannot appear: [ I, K, M, Y ]

*Examples:*

Valid: [ ABC, FGH, … ]

Invalid: [ ABI, YDF, … ]

**Presentation Scenario**

You will need to author code which performs the following functions:

1. For each vehicle in the dataset, generate a valid Vehicle Registration Number using the rules defined above.

1. Output the following information:
2. Total number of registration numbers generated.
3. Total number of registration numbers generated per registration area.

1. Were there any vehicles where the Vehicle Registration Number could not be determined? If so, how many?

You may use **any** reasonable general-purpose programming language to implement your solution. (Your audience will be unlikely to understand deliberately esoteric and obfuscatory toy languages, e.g., Malbolge.)

The code is expected to compile and run successfully. You may use third-party libraries to assist you, but the implementation of task must be original.

You **do not** have to implement testing for this code, **but** you should consider how you might test it since you may be asked about it.

**You must submit your solution at least 24 hours before your interview.** Please provide a link to a public source code repository such as GitHub to [ITSRecruitment@dvla.gov.uk](mailto:ITSRecruitment@dvla.gov.uk)

**The Presentation Task**

You should prepare a short (10 minutes) presentation in advance. You will be asked to present this during the interview.

Your presentation **should** cover:

- A working demo of your code against the two criteria

- A general overview of how your code works

- Aspects of the task you enjoyed or disliked

- Aspects of the task you found difficult and why

- Aspects of your code you would improve or change if you refactored it or did the task again

Your presentation **should not** cover:

- A line-by-line explanation of the code