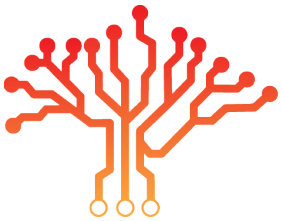

AI SINGAPORE

Technical Assessment

Deadline: 1900hrs, 15 June 2020

Submissions after the deadline will not be accepted. Please submit the completed assessment early to ensure a smooth submission process.

Tasks

This technical assessment consists of two main parts:

1. Computational Thinking and Programming Question
2. Data Engineering and Analysis using Spreadsheets

You are to attempt all parts and package a submission containing deliverables for each of the tasks, specified below.

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1. Programming Question

This is an algorithm question. You will be tested on your algorithm design skills, as well as your ability to write high quality code.

Given a 6 or less digits positive integer (0- 999999 inclusive), write a function `englishify(number: int)` that returns the full English equivalent of that number. Here are some samples of the structure you are expected to generate:

Numerical	Spelling
1	One
22	Twenty Two
222	Two Hundred And Twenty Two
202	Two Hundred And Two
1234	One Thousand, Two Hundred and Thirty Four
4040	Four Thousand And Forty
31337	Thirty One Thousand, Three Hundred And Thirty Seven
55227	Fifty Five Thousand, Two Hundred and Twenty Seven
100080	One Hundred Thousand And Eighty
500000	Five Hundred Thousand
609018	Six Hundred And Nine Thousand And Eighteen

General rules:

- No dashes/hyphens
- Capitalise Every Word
- Use British spelling
- There should be a comma, but not "And" after the thousands, before the hundreds if both exist
- Use "And" where otherwise appropriate

Deliverables:

Part 1

1. Using either pseudocode **OR** flowchart diagrams, describe how your algorithm works. You can assume programming constructs common to most mainstream programming languages such as loops and conditional statements.

2. Write your answer in a Microsoft Word document. A solution written in Google Doc or other word processing software must be converted into a Word format. If you are drawing flowcharts, these can be pasted in the document as images.
3. The submission will be assessed based on the correctness of the algorithm and the clarity of the explanation.

Part 2

1. Implement your algorithm as a program. The solution can be implemented using any programming language from this list: **Python (Recommended)**, R, Scala, Java, C, C++, C#, Go, Bash Scripting
2. For compiled languages, provide **both** the executable binaries and the source code files.
3. The program must be executable in a BASH shell command line.
4. The program script must be named `englishify.[ext]` where [ext] is the usual file extension for the programming language used.
5. The program must be able to accept a single program argument; a text file containing one number per line. It will need to print out only the results onto the standard output with one result per line.
   A sample input text file is as such:

   ```
   1
   22
   ```

   The corresponding output from the program should be:

   ```
   1: One
   22: Twenty Two
   ```

   Using Python as an example, the program will be executed as such:
   > python englishify.py input.txt

6. In the same folder, create a simple text file, `README.txt` file that sufficiently:
   a. Provides instructions on how to run your scripts including any prerequisites and how to compile (for compiled languages)

Requirements/Specifics:

- Use the latest active version for the programming language as of 1st January 2020. If more than one **major** version is available, then use the **higher** major version number. For example, in Python, the two latest active versions on 1st January 2020 are 2.7.17 and 3.8.1. Therefore **version 3.8.1** should be used.

Evaluation:

You will be assessed on the correctness of your algorithm and the clarity of the explanation.

2. Data Engineering and Analysis using Spreadsheets

Using the spreadsheet specified on page 8 (under the heading 'Data'), complete the tasks as described on the first worksheet. You are expected to use either Microsoft Excel (Excel 2016 or newer) or Google Sheets for this section.

Deliverables:

1. A completed spreadsheet saved as an Excel file (extension .xlsx) or a link to a publicly shared Google Sheets.
2. For solutions using Google Sheets, the URL of the spreadsheet document should be written in a file *solution.txt* as its only content. Please ensure that the URL is valid and the document is shareable. Failure to access the file will be considered as an incomplete submission.

Assignments Requirements/Specifics:

- Some of the tasks require that you copy the formula used as a String in the provided cell. Please ensure this.
- Do not reorder the columns unless instructed otherwise.
- The submitted spreadsheet should not have any tables not required by the tasks. If you need to create an intermediate table to calculate something, remove this table once you have the results.

Evaluation:

You will be assessed on the ability to complete the tasks as described in the first worksheet. This includes having the correctly named worksheets, using the appropriate formulas and correctness of the calculated values.

Submission Format

Your work should be uploaded as a `*.zip` archive to AI Singapore's designated blob store (detailed below). The archive file is to be provided with the following naming convention:

`<firstname>_<lastname>_<last 4 characters of NRIC or Passport>.zip`
e.g. `john_lim_123X.zip`

The submission folder is to have the following structure (as an example):

```
├── englishify
│   ├── englishify.py (or source code + binary for compiled lang)
│   ├── englishify.docx
│   └── README.txt
└── spreadsheet
    └── solution.xlsx (or solution.txt which has the URL for solution
in Google Sheets)
```

Once you have packaged your submission, you are to upload your submission by following the steps detailed below:

1. Download and configure/install the Azure `azcopy` tool

2. Use the following URL and the `azcopy` tool to upload your files through the command line. The URL includes the required SAS token. Please ensure that you copy the link correctly and remove any white spaces.

   https://aisgaiap.blob.core.windows.net/aidp1-assessment-submission?sv=2019-10-10&ss=bfqt&srt=co&sp=rwac&se=2020-06-15T11:00:00Z&st=2020-05-27T12:21:32Z&spr=https&sig=fwYb%2FsRTFb13yxIJmrxN5HoFnqc5Jnp7khxZlHluwQY%3D

3. If your file has been successfully uploaded, you should observe an output that is similar to what is shown below:

```
Job cfebd42e-c333-9143-56aa-ed28b802d9dd summary
Elapsed Time (Minutes): 0.0334
Total Number Of Transfers: 1
Number of Transfers Completed: 1
Number of Transfers Failed: 0
Number of Transfers Skipped: 0
TotalBytesTransferred: 58651
Final Job Status: Completed
```

Note: The ability to use this tool is considered as part of the technical assessment and evaluation. There will be automated checks that will assess the conformance of your uploaded submission

to aforemen tioned specified instructions. Non-conformance to specified conventions/formats will negatively impact your overall score.

Data

URL:
https://aisgaiap.blob.core.windows.net/aidp1_-assessment-data/AIDP_TEST_Start.xlsx

Instruction:
To download the dataset, copy and paste the above url into an internet browser (e.g. Chrome). The Excel file will be automatically downloaded.