

## DRAFT, v0.1

### SOFT8023 – Assignment 1

Worth: 20%

Due: 29th October 2022 (submit via link in Canvas)

#### Concepts examined:

- Design patterns
- Remote procedure calls

#### Overview

This assignment involves developing a small-scale distributed system. Using Python and gRPC, develop a text-based word game that is like the popular hang-man game or the Wheel of Fortune TV game show.

#### Main Functionality using gRPC (11%)



You must develop a server component that accepts gRPC connections from a client component. The server component should load a list of phrases from the file “phrases.txt” and for each new game randomly select a phrase. It will then return a string to the client with underscores where the letters would be. For example, to take the infamous phrase in the image above, the server would return the string:

\_\_\_\_\_

(i.e. 7 underscores followed by 7 underscores followed by 2 underscores followed by 4 underscores followed by 3 underscores)

The client then displays the string and prompts the user for a letter guess, e.g.

\_\_\_\_\_ \_ \_ \_ \_

Letter? e

The client then sends the user response to the server and the server replaces any underscores with a matching letter, e.g.

\_\_\_\_\_E\_ \_E\_ \_E\_ \_ \_ \_ \_

Then the server sends the response back to the client and the loop continues until the phrase is completed when the user enters the final required letter.

For a bit of humour, see the following clip from the USA's Wheel of Fortune game show:  
[\(59\) Wheel of Fortune - Another Feather in Your Cap \(March 1, 2022\) - YouTube](#)



(Note: for those students for whom English is not a first language and might struggle with phrases like this, the phrase “another feather in your cap” is so well known for native English speakers that not being able to guess it from the letters that were revealed is almost unthinkable)

Here is a full sample run:

Welcome to the Wheel of Fortune!

\_ \_ \_ \_ \_ \_ \_ \_

Letter? e

\_ \_ \_ \_ \_ \_ \_ \_E

Letter? a

A \_ \_ \_ \_ \_ E

Letter? i

A \_ I \_ \_ I \_ E

Letter? D

A \_ I \_ \_ I \_ E

Letter? S

A S I \_ \_ I \_ E

Letter? T

A STIT \_ \_ I \_ TI \_ E

Letter? C

A STITC \_ I \_ TI \_ E

Letter? M

A STITC \_ I \_ TIME

Letter? N

A STITC \_ IN TIME

Letter? H

A STITCH IN TIME

Well done! Goodbye.

### Extra Feature (3%)

Add a feature to the game that improves it, e.g. scores, limit on the number of guesses, the ability to guess the full phrase. You can look to the TV show for inspiration.

### Use of 2 Patterns (6%)

Make use of one of the gang-of-four design patterns covered in class. Choices include:

- Make a lookup cache for phrases that uses the Singleton pattern.
- Use the Factory pattern to offer different game choices.
- Use Template or Strategy for different game variations.

*Note: Additional notes / instructions and a rubric will follow.*