Cognitive analysis of Elderly persons with AI and VR

**Project Team**

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**Motivation and Significance**

Elderly people lose cognitive ability as they grow older due to age, Alzheimer's, dementia, etc. Some common causes are medication side effects, depression, and dementia.[2] However it's complicated for them or their close relatives to identify the issue early enough to get proper treatment due to mobility, social stigma, etc.

We like to create an application using AI and VR, that elderly people can use at their own convenience. The application will ask questions to users and based on their responses, it will analyze their cognitive ability.

**Objectives**

This research aims to perform cognitive analysis using machine learning sentiment analysis with the help of VR tools.

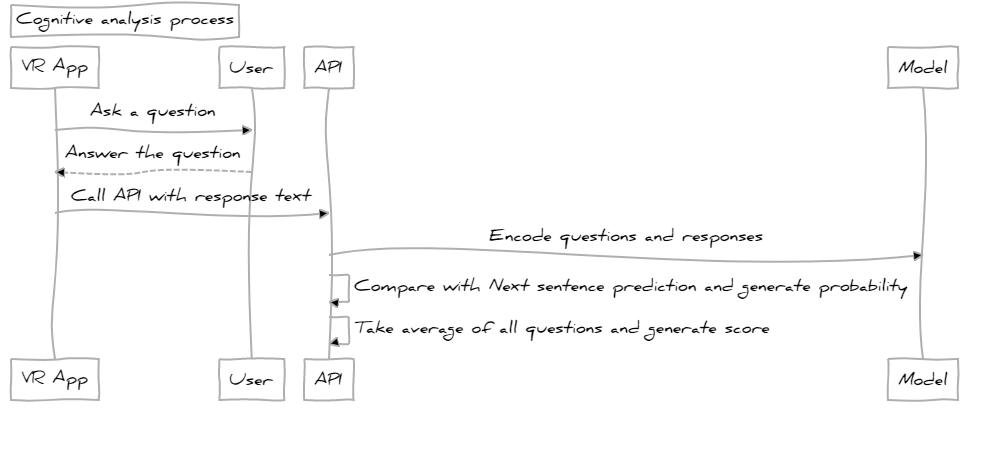
This application will ask day to day like questions to the user. It will capture the responses from the user. Our model will convert the voice responses to text and process them to predict a person's cognitive ability.

**Solution Approach**

We will build a VR game. It will ask questions related to daily activities. It will record the responses for each question provided by the user. Once the voice responses are captured, it will convert the voice to text and will send it to our API for question/answer analysis. Both the question and answers will be encoded using BERT tokenizer model. The resulting encoding will be processed using BertForNextSentencePrediction to get relationship legit. Then take a SoftMax to get similarity score between question and answer. If the similarity probability is more than 0.7, then the question and answers match.

At the end of the test, an average will be taken for all questions, which will be the score for cognitive ability.

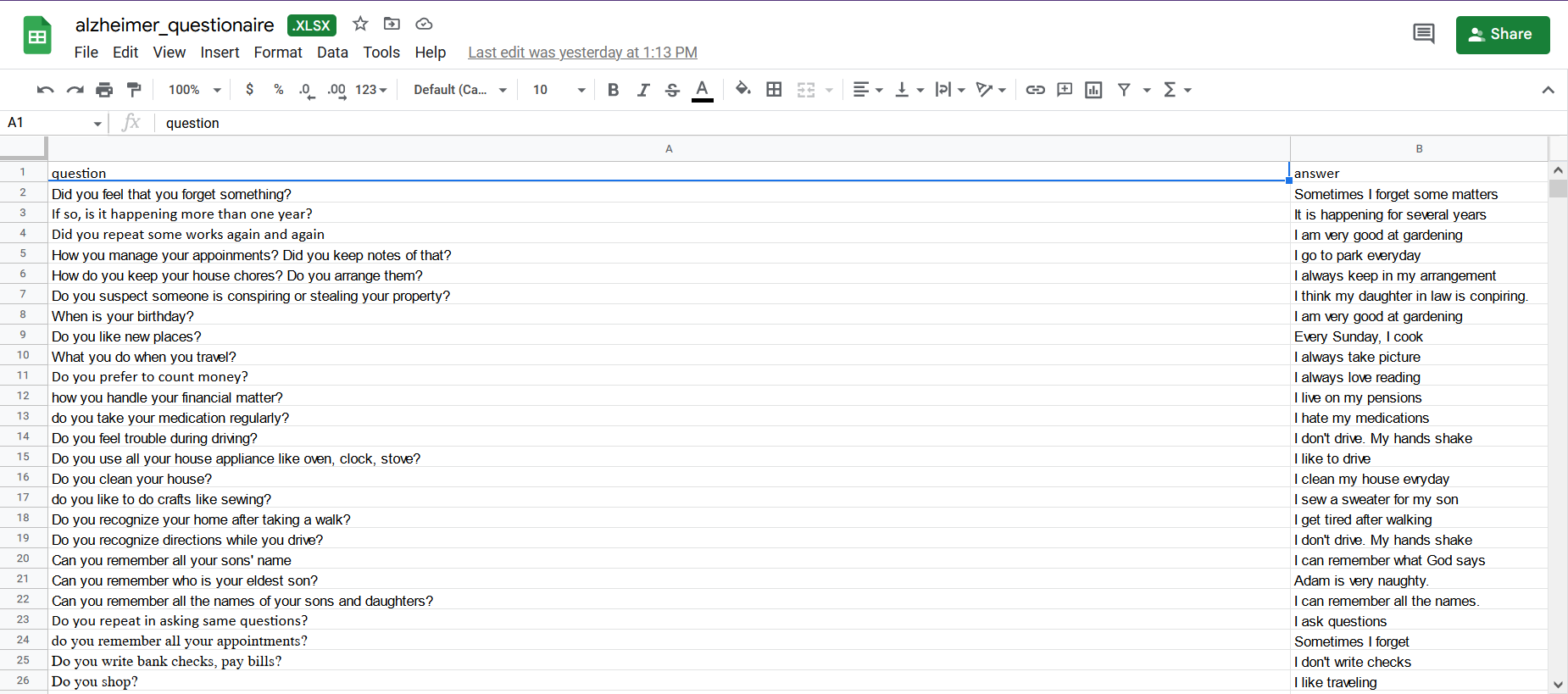
**Process Diagram**

**Fig 1. VSCode Sequence Diagram**

**Dataset**

Dataset is created by collecting several sources and medical reports and guides. Below is the dataset at a glance.

[https://docs.google.com/spreadsheets/d/13Zy6\_POa8iMN\_v9er59\_UZ1hCBI9-8Oq/edit#gid=475102244](https://docs.google.com/spreadsheets/d/13Zy6_POa8iMN_v9er59_UZ1hCBI9-8Oq/edit" \l "gid=475102244)



**Git Hub link**

[**dinesh-umkc/elderlycare: Hack-a-roo project for elderly care (github.com)**](https://github.com/dinesh-umkc/elderlycare)

**Results**

Rest API

**Conclusion**

**To be added**

**Reference**

[1]<https://www.kaggle.com/code/tanmay111/youtube-comments-sentiment-analysis/data>

[2] [Assessing Cognitive Impairment in Older Patients | National Institute on Aging (nih.gov)](https://www.nia.nih.gov/health/assessing-cognitive-impairment-older-patients)