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Semester Project Report

“Voice Operated Calculator”

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(2385 – 2018)

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This Project has been submitted to Mr Abid on the course AI Lab.

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M. Waleed Khan (2385-2018)

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1 Acknowledgment

We are really grateful because we managed to complete our E-project within the time given by our teacher *Sir Abid Ali*. This assignment cannot be completed without the effort and co-operation from our group members.

We also sincerely thank our teacher *Sir Abid Ali* for the guidance and encouragement in finishing this project and also for teaching us in this course. Last but not the least, we would like to express our gratitude to our friends for the support and willingness directly or indirectly to spend some times with us to fill in the questionnaires.

2 Abstract

The voice operated calculator ‘*VOC*’ is a speaker-independent system that is used to perform basic mathematical operations. It recognizes the isolated spoken digits from 0 to 9, and other words like plus, minus, times, equal and clear. It then performs the respective arithmetic operations, and displays the final answer on an LCD display.

3 Introduction

Speaker-independent voice recognition systems have a very strong probability of becoming a necessity in the workplace in the future. Such systems would be able to improve productivity and would be more convenient to use. The idea of a hardware that can recognize any person’s voice without the training time involved in currently employed systems is a very promising one, and possibly a marketable one too.

At its most basic level speech recognition allows the user to perform parallel tasks, (i.e. hands and eyes are busy elsewhere) while continuing to work with the computer or appliance. Another aspect of this hardware would be in the assistance of hand-disabled people.

VOC looks and functions like a common calculator. However, this assistive technology system has a voice to text and text to voice functions so that each time we give command our voice command will convert to text and the result will appear in text and also in in the form voice. This can help the user to verify that the numbers and operands have been entered correctly. The calculator also speaks the answer to the math problem.

4 Project Objectives

4.1 Problem Statement

We are targeting the special people around us we want to empower and provide ease to them all most everyone encountered a person without hands how they calculate and audit the daily expenses or budget that person could be shopkeeper, student, housewife etc. Everyone need check and balance we are hopping with help of *VOC* we can minimize their struggle if not end.

5 System Requirements

5.1 Hardware Requirements

The Following Hardware was utilized during development of the system;

1. Intel i7-4790, 4.0 Ghz, 4 cores, 8 threads Processor.
2. 16 GB Ram.
3. 256 GB.
4. High Definition Audio Headphones.

5.2 Software Requirements

The Following softwares were installed & utilized during development of the system;

1. Windows 11 Pro.
2. Visual Studio 2022 Preview.
3. Python 3.09

5.2.1 Python Libraries

The Following python were installed & utilized during development of the system;

1. operator
2. typing
3. speech_recognition
4. gTTS
5. pydub
6. winsound
7. time

6 Work Analysis

Task	M. Waleed Khan	Azim Haider
Analysis	x	✓
Design	✓	x
Coding	✓	x
Testing	✓	x
Documentation	✓	✓

7 Code

```
# saari Libraries
import operator
from typing import Text
import speech_recognition as s_r
from gtts import gTTS
from pydub import AudioSegment
import winsound
import time
import os #Unused Library

# Check karne keh liye keh code chala or
# Speech Recogniton ki libaray neh masla toh nai kiya
print("Your speech_recognition version is: "+s_r.__version__)

#object banaya hai Recognizer Ka
r = s_r.Recognizer()

while True:
    #Mircophone ko inititalize karne keh liye
    my_mic_device = s_r.Microphone(device_index=1)
    with my_mic_device as source:
        print("Say what you want to calculate, example: 3 plus 3")

    # Distortion ko kum karne keh liye
    r.adjust_for_ambient_noise(source)

    # Bata Rahay hen keh Audio kaha seh lani hai
    audio = r.listen(source)

    # yahan recognition hori hai
    my_string=r.recognize_google(audio)

    # yahan show karayeGa keh uski samajh meh kiya aya
    print(my_string)

    # yahan Calculator ka code shuru hai
    def get_operator_fn(op):
        return {
            '+' : operator.add,
            '-' : operator.sub,
            'x' : operator.mul,
            'divided' :operator.__truediv__,
            'Mod' : operator.mod,
            'mod' : operator.mod,
            '^' : operator.xor,
        }[op]

    # yahan Calculation hori hai
```

```
def eval_binary_expr(op1, oper, op2):
    op1,op2 = int(op1), int(op2)
    return get_operator_fn(oper)(op1, op2)

# Calculate hui we value print hori hai
print(eval_binary_expr(*(my_string.split()))))

# yaha int wali value ko string meh store karke
# FS keh variable meh dala hai
FS = str(eval_binary_expr(*(my_string.split()))))

# By default Equals to nai bol raha tha toh usko string meh daldiya
EQ = " Equals to "

# Yahan jo kuch bulwana hai usko ek string meh dal rahay hen
Final_String = my_string + EQ + FS

# yahan bata rahay hen keh language konsi hai
language = 'en'

#Yahan Object bana rahay hen gTTS ka
myobj = gTTS(text=Final_String, lang=language, slow=False)

# yahan audio file save hori hai
myobj.save("Audio.mp3")

# convert wav to mp3
# jab Mp3 play karay thay toh media player launch hora tha
sound = AudioSegment.from_mp3("Audio.mp3")
sound.export("Wav_audio.wav", format="wav")
winsound.PlaySound('Wav_audio.wav', winsound.SND_ASYNC)

# Audio complete play honay seh pehle Script end hori thee isliye sleep lagaDiya
time.sleep(5)
my_mic_device = s_r.Microphone(device_index=1)
# Yaha puchayGA or kuch calcualte karna hai ?
with my_mic_device as source:
    print("Any More Calculations ?")

# Distortion ko kum karne keh liye
r.adjust_for_ambient_noise(source)

# Bata Rahay hen keh Audio kaha seh lani hai
audio = r.listen(source)

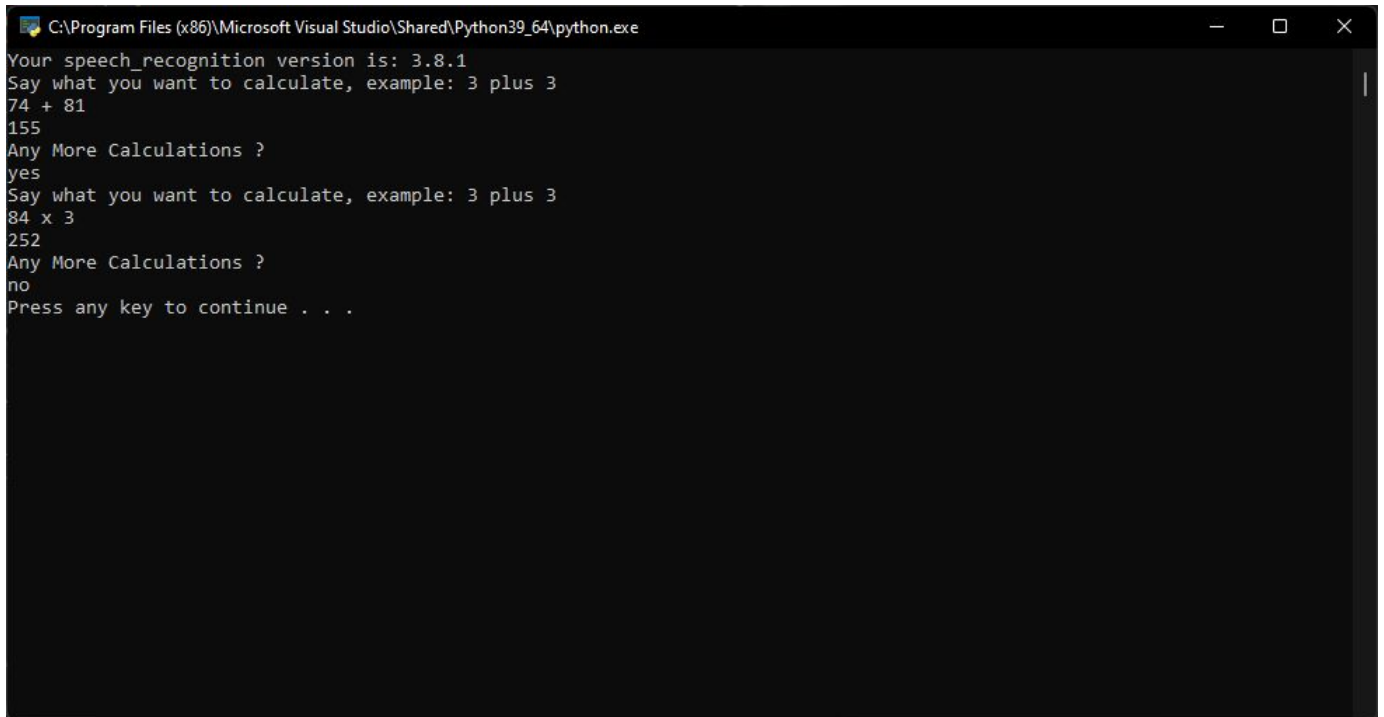
# yahan recognition hori hai
my_string=r.recognize_google(audio)

# Agr User No boleGa toh exit kardeGa warna repeat hojaye Program
```

```
print(my_string)
if my_string == "no":
    break

# Comented code (Ignore)
# os.system("start Audio.mp3")
```

8 Output



```
C:\Program Files (x86)\Microsoft Visual Studio\Shared\Python39_64\python.exe
Your speech_recognition version is: 3.8.1
Say what you want to calculate, example: 3 plus 3
74 + 81
155
Any More Calculations ?
yes
Say what you want to calculate, example: 3 plus 3
84 x 3
252
Any More Calculations ?
no
Press any key to continue . . .
```

9 Project Link

https://github.com/Waleedk464/Calculator_using_speech_recognition