

## CA 3: Experiential Learning

### Group Members:

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### Problem Statement:

The objective of this code is to create a simple text-based virtual assistant that can interact with the user through a command-line interface in order to provide them with a simple way to interact with it. This virtual assistant can perform various tasks based on user input, including opening web pages, searching the internet, greeting the user, and responding to specific commands.

### Explanation:

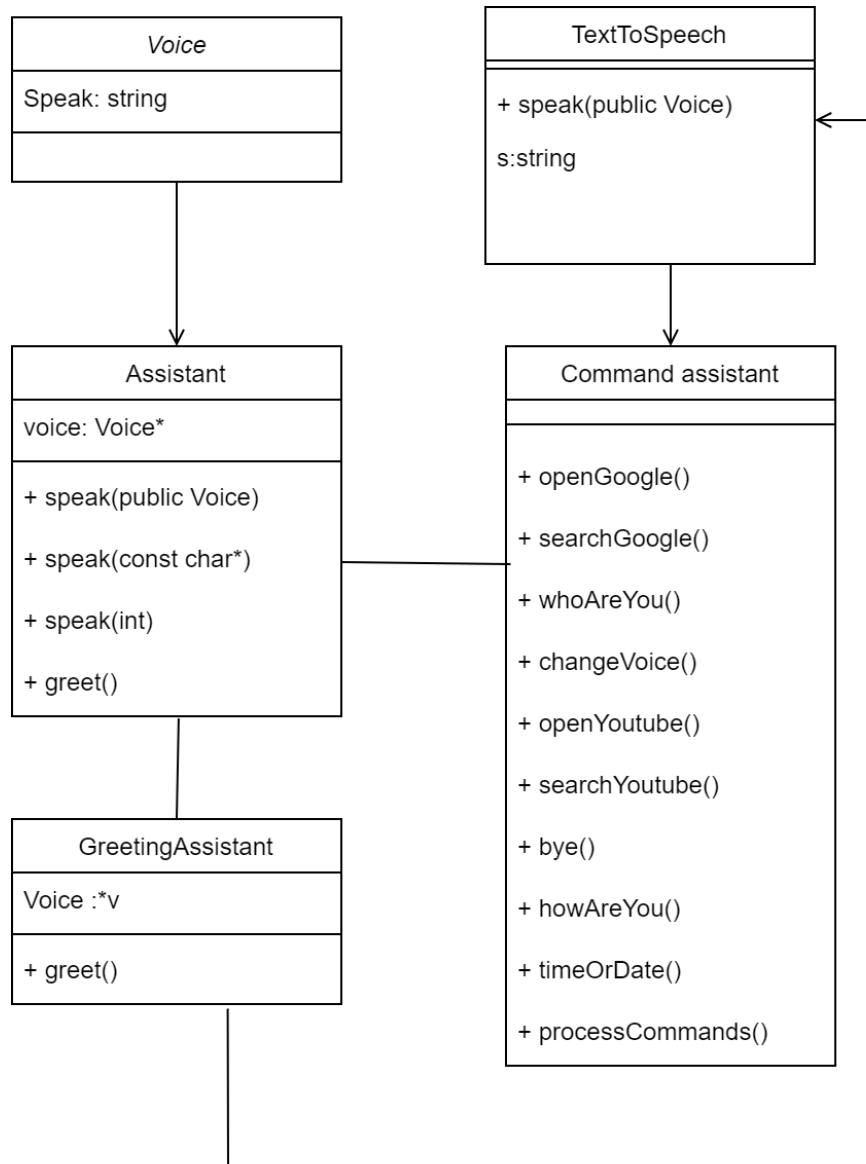
It is the aim of the project to develop a basic virtual assistant that can assist the user with a limited set of tasks through text-based interaction with the assistant. There are various tasks that the virtual assistant can perform, including answering specific textual commands, providing greetings, opening websites, and performing basic web searches for the user.

### Key Components:

- **Voice and Text-to-Speech:**
  - This project includes a voice component for converting text into speech. To enable the assistant to speak aloud, it uses a simple Text-to-Speech (TTS) approach.
  - The **Voice** class serves as the base class, and **TextToSpeech** is an implementation of voice functionality. It generates a VBScript file (**speak.vbs**) and uses SAPI (Speech Application Programming Interface) to produce speech.
- **Assistant Classes:** There are two main assistant classes:
  - **GreetingAssistant:** This assistant is specialized for providing greetings based on the time of day.
  - **CommandAssistant:** This assistant is responsible for processing user commands entered via text input.
- **User Interaction**
  - User input is collected using the **gets** function, which reads text input from the command line.
  - The assistant interacts with the user by both speaking the responses using TTS and displaying text on the console.
- **Functionality:** TONI can perform various tasks like
  - opening browsers
  - opening application

- conducting web searches on Google and Youtube
- Informing date and time
- Basic chat like “who are you” and “how are you”

### Class Diagram:



## Code Snippets:

```
1 #include <iostream>
2 #include <windows.h>
3 #include <mmsystem.h>
4 #include <stdio.h>
5 #include <ctime>
6 #include <fstream>
7 #include <cstdio>
8
9 using namespace std;
10
11 // Base class for voice functionality
12 class Voice
13 {
14 public:
15     virtual void speak(string s) = 0;
16 };
17
18 // Text-to-speech implementation of Voice
19 class TextToSpeech : public Voice
20 {
21 public:
22     void speak(string s) override
23     {
24         // Write the text to a VBScript file and use SAPI for speech synthesis
25         ofstream file;
26         file.open("speak.vbs", ios::out);
27         file << "dim s";
28         file << "\nset s = createObject(\"sapi.spvoice\")";
29         file << "\ns.speak \"" << s << "\"";
30         file.close();
31         // Execute the VBScript to play the speech
32         system("start speak.vbs");
33         Sleep(300);
34     }
35 };
36
37 // Base class for the assistant
38 class Assistant
39 {
40 public:
41     Voice *voice;
42
43     Assistant(Voice *v) : voice(v) {}
44
45     // Overloaded typing function to display and speak messages
46     void typing(string t)
47     {
48         voice->speak(t);
49         cout << "\n\n";
50         for (int i = 0; t[i] != '\0'; i++)
51         {
52             cout << t[i];
53             Sleep(65);
54         }
55     }
56
57     void typing(const char *t)
```

```

58     {
59         typing(string(t));
60     }
61
62     void typing(int t)
63     {
64         typing(to_string(t));
65     }
66 };
67
68 // Assistant specialized for greeting
69 class GreetingAssistant : public Assistant
70 {
71 public:
72     GreetingAssistant(Voice *v) : Assistant(v) {}
73
74     // Greet the user based on the time of day
75     void greet()
76     {
77         time_t now = time(0);
78         tm *time = localtime(&now);
79
80         if (time->tm_hour < 12)
81         {
82             typing("Good Morning");
83         }
84         else if (time->tm_hour >= 12 && time->tm_hour <= 16)
85         {
86             typing("Good Afternoon");
87         }
88         else if (time->tm_hour > 16 && time->tm_hour < 24)
89         {
90             typing("Good Evening");
91         }
92     }
93 };
94
95 // Assistant for processing user commands
96 class CommandAssistant : public Assistant
97 {
98 public:
99     CommandAssistant(Voice *v) : Assistant(v) {}
100
101     void openGoogle()
102     {
103         string s = "https://www.google.co.in/";
104         typing("opening google in chrome browser");
105         cout << "\n\n";
106         ShellExecute(NULL, "open", s.c_str(), NULL, NULL, SW_SHOWNORMAL);
107     }
108
109     void searchGoogle()
110     {
111         char text[100];
112         string res;
113         string g = "https://www.google.com/search?q=";
114         typing("Enter what do you want to search : ");
115         gets(text);
116         res = g + text;
117         typing("searching in google");

```

```

118     cout << "\n\n";
119     ShellExecute(NULL, "open", res.c_str(), NULL, NULL, SW_SHOWNORMAL);
120 }
121
122 void whoAreYou()
123 {
124     typing("Hi!, I'm Toni, which stands for 'Totally Overrated Noise Initiator.' My
capabilities include executing straightforward tasks like conducting searches across various
platforms and engaging in basic conversations.");
125     cout << "\n\n";
126 }
127
128 void changeVoice()
129 {
130     typing("I'm sorry, but your request goes against my programming to maintain a respec
and helpful tone. If you have any other requests or need assistance with something, please f
free to ask, and I'll be happy to help");
131     cout << "\n\n";
132 }
133
134 void openYoutube()
135 {
136     string n = "https://www.youtube.com/";
137
138     typing("Opening youtube in chrome browser");
139     cout << "\n\n";
140
141     ShellExecute(NULL, "open", n.c_str(), NULL, NULL, SW_SHOWNORMAL);
142 }
143
144 void searchYoutube()
145 {
146     char text1[100];
147
148     typing("Enter what do you want to search : ");
149     gets(text1);
150
151     string s;
152     string res1 = "https://www.youtube.com/results?search_query=";
153
154     s = res1 + text1;
155
156     typing("searching on youtube");
157     cout << "\n\n";
158
159     ShellExecute(NULL, "open", s.c_str(), NULL, NULL, SW_SHOWNORMAL);
160 }
161
162 void bye()
163 {
164     system("cls");
165     typing("Have a nice day");
166     exit(0);
167 }
168
169 void howAreYou()
170 {
171     typing("I am good!, How are you!");
172     cout << "\n\n";
173 }
174

```

```

175 void hello()
176 {
177     typing("what I can do for you ");
178     cout << "\n\n";
179 }
180
181 void timeOrDate()
182 {
183     typing("the time and date is on top of the application");
184     cout << "\n\n";
185 }
186
187 void processCommands()
188 {
189     char ch[100];
190     while (1)
191     {
192         gets(ch);
193
194         if (strcmp(ch, "open google") == 0)
195         {
196             openGoogle();
197         }
198         else if (strcmp(ch, "search google") == 0)
199         {
200             searchGoogle();
201         }
202         else if (strcmp(ch, "who are you?") == 0)
203         {
204             whoAreYou();
205         }
206         else if (strcmp(ch, "change voice") == 0)
207         {
208             changeVoice();
209         }
210         else if (strcmp(ch, "open youtube") == 0)
211         {
212             openYoutube();
213         }
214         else if (strcmp(ch, "search youtube") == 0)
215         {
216             searchYoutube();
217         }
218         else if (strcmp(ch, "bye") == 0 || strcmp(ch, "stop") == 0 || strcmp(ch, "exit")
219 0)
220         {
221             bye();
222         }
223         else if (strcmp(ch, "how are you") == 0)
224         {
225             howAreYou();
226         }
227         else if (strcmp(ch, "hi") == 0 || strcmp(ch, "hello") == 0)
228         {
229             hello();
230         }
231         else if (strcmp(ch, "time") == 0 || strcmp(ch, "date") == 0)
232         {
233             timeOrDate();
234         }
235     }
236 }

```

```

234         else
235         {
236             typing("Pardon, Invalid command");
237             cout << "\n\n";
238         }
239     }
240 }
241 };
242
243 int main()
244 {
245     TextToSpeech tts;
246     GreetingAssistant greetingAssistant(&tts);
247     CommandAssistant commandAssistant(&tts);
248
249     greetingAssistant.greet();
250
251     cout << "\n\n***** Your Assistant
***** \n\n";
252     time_t now = time(0);
253     char *dt = ctime(&now);
254     cout << "\n\nThe date and time is " << dt << endl;
255     cout << "
*****
=> ";
256
257     commandAssistant.processCommands();
258
259     return 0;
260 }
261

```

## Input/Output:

```

Good Evening
***** Your Assistant *****

The date and time is Sun Oct 15 17:47:56 2023
*****

==>  hello

what I can do for you
who are you?

Hi!,I'm Toni, which stands for 'Totally Overrated Noise Initiator.' My capabilities include executing straightforward tasks like conducting searches across various plat
forms and engaging in basic conversations.

how are you

I am good!, How are you!

change voice

I'm sorry, but your request goes against my programming to maintain a respectful and helpful tone. If you have any other requests or need assistance with something, ple
ase feel free to ask, and I'll be happy to help

```

open google

opening google in chrome browser

search youtube

Enter what do you want to search : abcd

Have a nice day

### **Github repository link**

[https://github.com/TanishaVyas/Voice\\_Assistant\\_TONI\\_Cpp](https://github.com/TanishaVyas/Voice_Assistant_TONI_Cpp)