

Mobile_Lesson6: Speech to Text and Text to Speech

ICP GROUP: 38

ICP 13

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ICP13 Repository: <https://github.com/UMKC-APL-WebMobileProgramming/ICP13-AnilkumarreddyNandikonda>

ICP13 source code link: <https://github.com/UMKC-APL-WebMobileProgramming/ICP13-AnilkumarreddyNandikonda/tree/main/Source/Speech%20to%20text>

ICP13 Video: <https://umsystem.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=ccd982eb-a9ff-4efd-8dd6-adf60071152d>

My Partner

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Partner Repository: <https://github.com/UMKC-APL-WebMobileProgramming/ICP13-YAbhinay>

Source Code Link: <https://github.com/UMKC-APL-WebMobileProgramming/ICP13-YAbhinay/tree/main/Source/Speech%20to%20text/app/src>

ICP13 video: <https://umsystem.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=ccd982eb-a9ff-4efd-8dd6-adf60071152d>

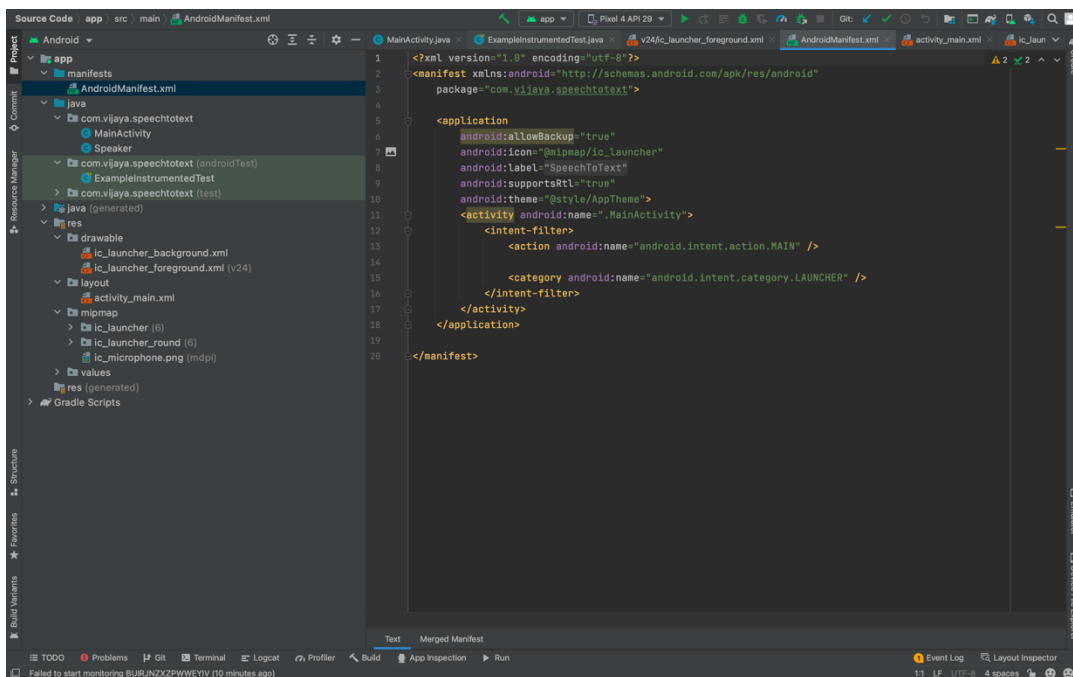
Lesson Overview: In this lesson, we are going to discuss speech to text and text to speech applications

Programming elements:Speech to Text and Text to Speech

In Class Programming (ICP):Create a Medical AssistantApplication in the following steps.

- 1.Use the layout given in the second use case speech to text.
- 2.As soon as the app opens,it should say hello
- 3.Then the user clicks on the mic button to say hello
- 4.Once the user said hello,the app should speak,"what is your name?"
- 5.Then the user clicks on the mic button to say, "My name is"<your name>
- 6.Extract the name of the user and then save it as editor level.Code snippet: private SharedPreferences preferences;private SharedPreferences.Editor editor;preferences = getSharedPreferences(PREFS,0);editor = preferences.edit();editor.putString(NAME,<extracted name>).apply();//private static final String NAME = "name";
- 7.Also,show the name on the screen
- 8.When the user asks the following questions, appropriate answers should be given:

- This androidmanifest.xml tells the main theme of the application.



- Firstly, new text-to-speech is created if it detects you then it will greets back.

```

42
43
44 @Override
45 protected void onCreate(Bundle savedInstanceState) {
46     super.onCreate(savedInstanceState);
47     setContentView(R.layout.activity_main);
48     preferences = getSharedPreferences(PREFS, mode: 0);
49     editor = preferences.edit();
50
51     mts = new TextToSpeech(getApplicationContext(), (status) -> {
52         if(status != TextToSpeech.ERROR) {
53             mts.setLanguage(Locale.US);
54             mts.speak("Hello", TextToSpeech.QUEUE_FLUSH, null);
55         }
56     });
57
58     mVoiceInputV = (TextView) findViewById(R.id.voiceInput);
59     mSpeakBtn = (ImageButton) findViewById(R.id.btnSpeak);
60     mSpeakBtn.setOnClickListener(v -> { startVoiceInput(); });
61
62     private void startVoiceInput() {
63         Intent intent = new Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH);
64         intent.putExtra(RecognizerIntent.EXTRA_LANGUAGE_MODEL, RecognizerIntent.LANGUAGE_MODEL_FREE_FORM);
65         intent.putExtra(RecognizerIntent.EXTRA_LANGUAGE, Locale.getDefault());
66         intent.putExtra(RecognizerIntent.EXTRA_PROMPT, "Please Say Hello!! to Contact Medical Assistant");
67         try {
68             startActivityForResult(intent, REQ_CODE_SPEECH_INPUT);
69         } catch (ActivityNotFoundException a) {
70
71         }
72     }
73
74     @Override
75     protected void onActivityResult(int requestCode, int resultCode, Intent data) {
76         super.onActivityResult(requestCode, resultCode, data);
77         switch (requestCode) {
78             case REQ_CODE_SPEECH_INPUT: {
79                 if (resultCode == RESULT_OK && null != data) {
80
81                 }
82             }
83         }
84     }
85
86     private void recognition(String text){
87         //creating an array which contains the words of the answer
88         String name;
89         String[] speech = text.split(" ");
90
91         if(text.contains("hello")) {
92             mts.speak("What is your name", TextToSpeech.QUEUE_FLUSH, null);
93             mVoiceInputV.append(Html.fromHtml("User : " + text));
94             mVoiceInputV.append(Html.fromHtml("Medical Assistant : What is your name ?"));
95         }
96         if(text.contains("my name is"))
97         {
98             name = speech[speech.length-1];
99             editor.putString(NAME, name).apply();
100             mts.speak("Your name is " + preferences.getString(NAME, null), TextToSpeech.QUEUE_FLUSH, null);
101             mVoiceInputV.append(Html.fromHtml("Changing User's name as " + name));
102             mVoiceInputV.append(Html.fromHtml("Medical Assistant : Your name is " + preferences.getString(NAME, null)));
103         }
104         if(text.contains("not feeling good"))
105         {
106             mts.speak("I can understand. Please tell your symptoms in short.", TextToSpeech.QUEUE_FLUSH, null);
107             mVoiceInputV.append(Html.fromHtml("Medical Assistant : I can understand. Please tell your symptoms in short."));
108         }
109     }
110
111     TODO
112     Problems
113     Git
114     Terminal
115     Logcat
116     Profiler
117     Build
118     App Inspection
119     Run
120
121     Event Log
122     Layout Inspector
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124     28:40 LF UTF-8 4 spaces
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126     Failed to start monitoring BURJUNZXPWWEYIV (14 minutes ago)
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```

- If we ask for time it will take the word “time” and gives the system time.
- Then detects the word “medicine” from the sentence we say, it will tell us that we have fever and take medicine
- If we want to end the conversation then it will ends with “thank you”.

```

124 mVoiceInputV.append(Html.fromHtml( source: "<p style='color:green;'>Medical Assistant : I can understand. Please tell your symptoms in shor
125
126 }
127 if(text.contains("time"))
128 {
129     SimpleDateFormat sdfDate = new SimpleDateFormat( pattern: "HH:mm"); //dd/MM/yyyy
130     Date now = new Date();
131     String[] strDate = sdfDate.format(now).split( regex: "\\:");
132     if(strDate[1].contains("00")) {
133         strDate[1] = "o'clock";
134     }
135     tts.speak( text: "The time is " + sdfDate.format(now), TextToSpeech.QUEUE_FLUSH, params: null);
136     mVoiceInputV.append(Html.fromHtml( source: "<p style='color:red;'>"+preferences.getString(NAME, s1: null)+ " : " +text+"</p>"));
137     mVoiceInputV.append(Html.fromHtml( source: "<p style='color:green;'>Medical Assistant : The time is " + sdfDate.format(now)+"</p>"));
138
139 }
140 if(text.contains("medicine"))
141 {
142     tts.speak( text: "I think you have fever. Please take this medicine.", TextToSpeech.QUEUE_FLUSH, params: null);
143     mVoiceInputV.append(Html.fromHtml( source: "<p style='color:red;'>"+preferences.getString(NAME, s1: null)+ " : " +text+"</p>"));
144     mVoiceInputV.append(Html.fromHtml( source: "<p style='color:green;'>Medical Assistant : I think you have fever. Please take this medicine.</p>"));
145
146 }
147 if(text.contains("thank you")) {
148     if (text.contains("medical assistant")) {
149         tts.speak( text: "Thank you too " + preferences.getString(NAME, s1: null) + "Take care", TextToSpeech.QUEUE_FLUSH, params: null);
150         mVoiceInputV.append(Html.fromHtml( source: "<p style='color:red;'>"+preferences.getString(NAME, s1: null)+ " : " +text+"</p>"));
151         mVoiceInputV.append(Html.fromHtml( source: "<p style='color:green;'>Medical Assistant : Thank you too " + preferences.getString(NAME, s1: null) + "Ta
152     }
153 }
154 }
155 }
156 }

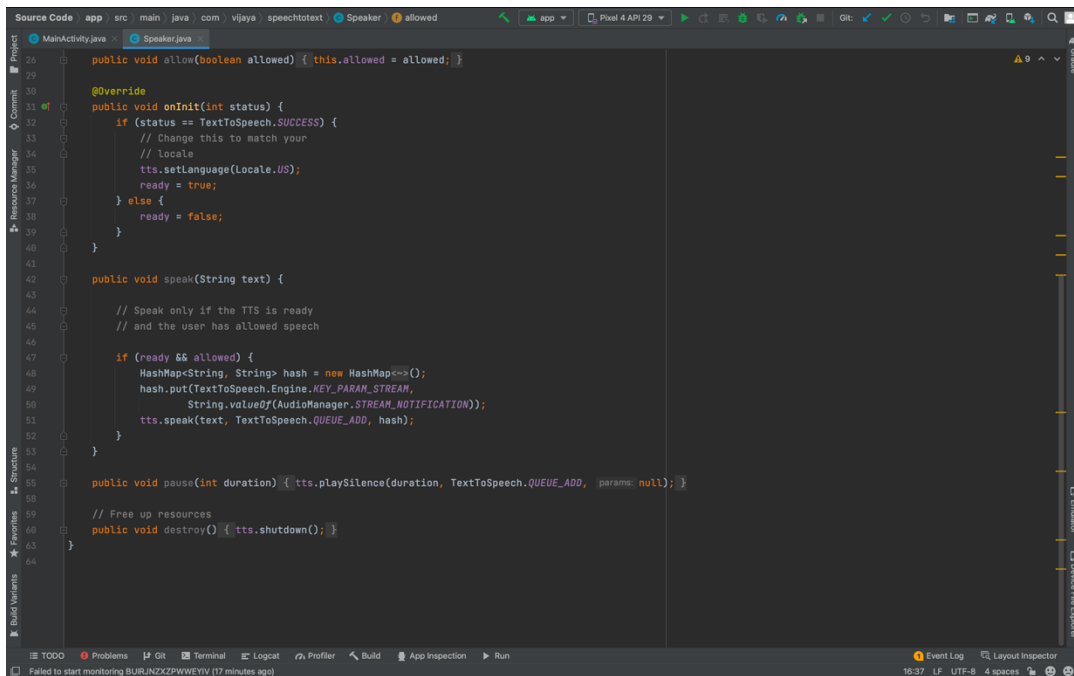
```

- Speak to text uses the HASHMAP to store the data in hash table, so that we see the output text.

```

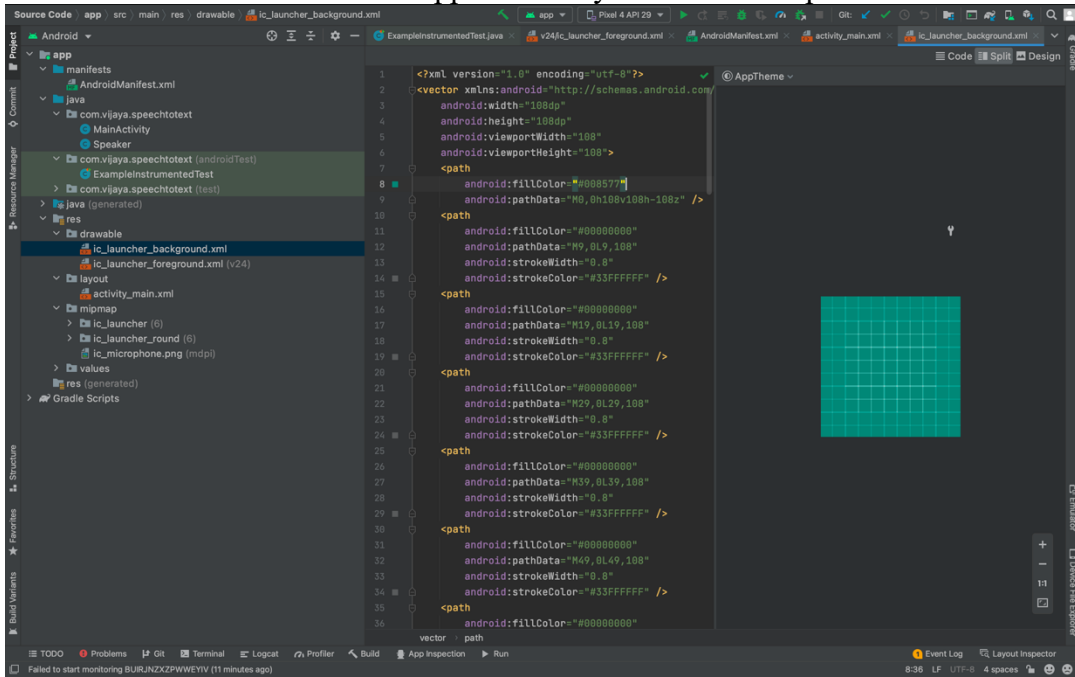
1 package com.vijaya.speechtotext;
2
3 import android.content.Context;
4 import android.media.AudioManager;
5 import android.speech.tts.TextToSpeech;
6
7 import java.util.HashMap;
8 import java.util.Locale;
9
10 public class Speaker implements TextToSpeech.OnInitListener {
11
12     private TextToSpeech tts;
13
14     private boolean ready = false;
15
16     private boolean allowed = false;
17
18     public Speaker(Context context) { tts = new TextToSpeech(context, listener: this); }
19
20     public boolean isAllowed() { return allowed; }
21
22     public void allow(boolean allowed) { this.allowed = allowed; }
23
24     @Override
25     public void onInit(int status) {
26         if (status == TextToSpeech.SUCCESS) {
27             // Change this to match your
28             // locale
29             tts.setLanguage(Locale.US);
30             ready = true;
31         } else {
32             ready = false;
33         }
34     }
35
36     public void speak(String text) {
37         // Speak only if the TTS is ready
38     }
39 }

```



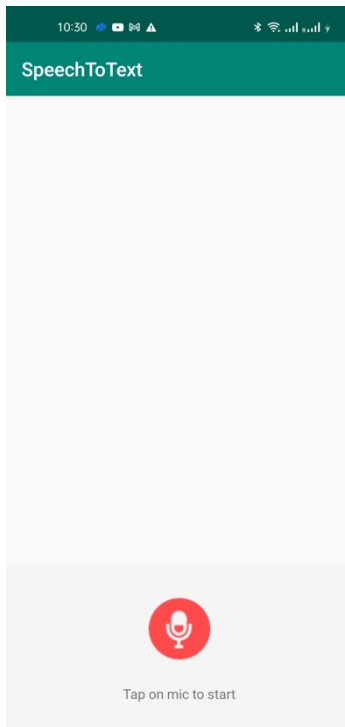
```
Source Code app src main java com vijaya speectotext Speaker allowed
Speaker.java
26 public void allow(boolean allowed) { this.allowed = allowed; }
29
30 @Override
31 public void onInit(int status) {
32     if (status == TextToSpeech.SUCCESS) {
33         // Change this to match your
34         // locale
35         tts.setLanguage(Locale.US);
36         ready = true;
37     } else {
38         ready = false;
39     }
40 }
41
42 public void speak(String text) {
43
44     // Speak only if the TTS is ready
45     // and the user has allowed speech
46
47     if (ready && allowed) {
48         HashMap<String, String> hash = new HashMap<>();
49         hash.put(TextToSpeech.Engine.KEY_PARAM_STREAM,
50             String.valueOf(AudioManager.STREAM_NOTIFICATION));
51         tts.speak(text, TextToSpeech.QUEUE_ADD, hash);
52     }
53 }
54
55 public void pause(int duration) { tts.playSilence(duration, TextToSpeech.QUEUE_ADD, params: null); }
58
59 // Free up resources
60 public void destroy() { tts.shutdown(); }
63
64 }
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- Here is the .xml file for overall application layout will be setup.



OUTPUT:

The initial page when the app gets installed is as follows.



When we speak to the google assistant it will respectively replies as follows:

