

# Dhwani Sarathi

SIH 1403

*App Based Digital Audiometer*

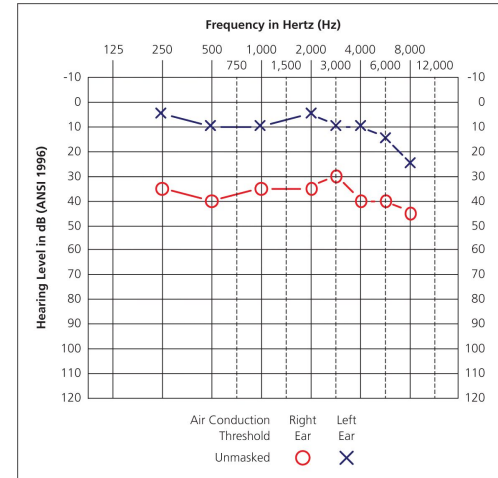
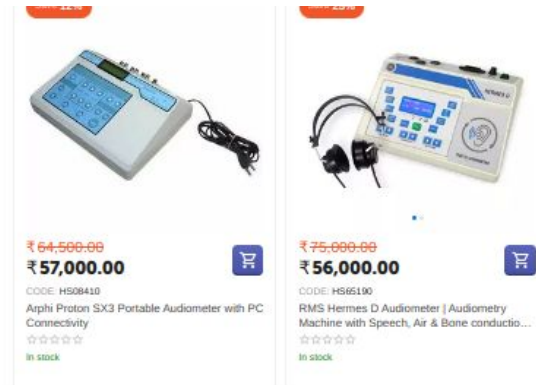


Team gps4

# Current Situation

## Pure-Tone Audiometer

- Portability and Size
- Cost (> 50 000 INR)
- Hardware Availability Issues
- Lack of expert professionals
- History of Patient Data (Bulk data)



# Need for App-based Solution

- **Early Detection**
  - Regular Monitoring
  - Timely interventions and treatments
- **Convenience**
  - Availability
  - Remote testing
- **Data Tracking and Analysis**
  - Large-Scale Studies
  - Tailored Testing



# Use Cases

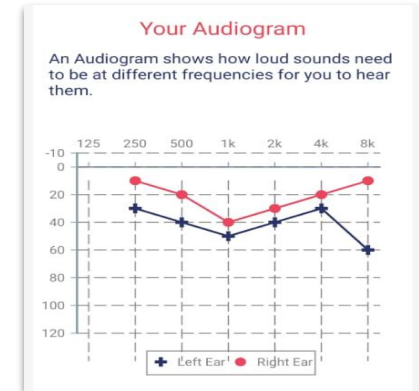
## Schools and Children



## Industry checkups



## Doctors



# Use Cases

## Schools and Children

- **Regular School Checkups**
  - Large number of tests
  - Periodic Records
- **Early Detection in Children**
  - Timely medical attention
  - Hearing aids, assistive listening devices



# Use Cases

## Regular Industry checkups

- **Occupational hazards**
  - Sawmills, textile industry, printing press, etc.
  - Repeated exposure to loud noise
  - Govt. mandates use of safety equipments

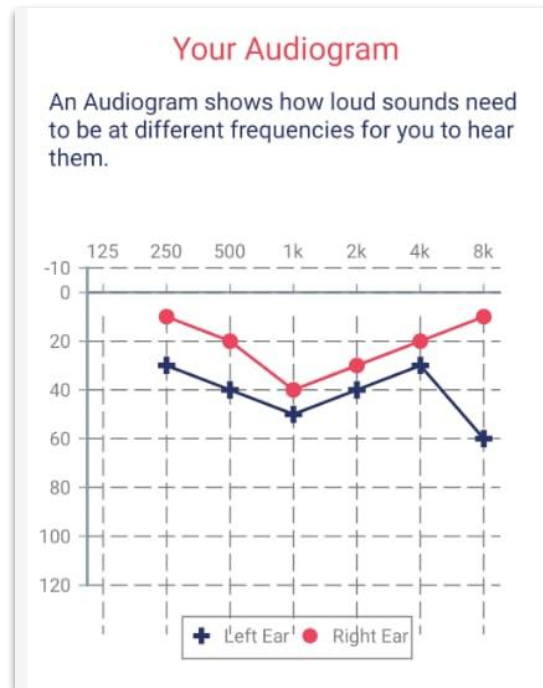




# Use Cases

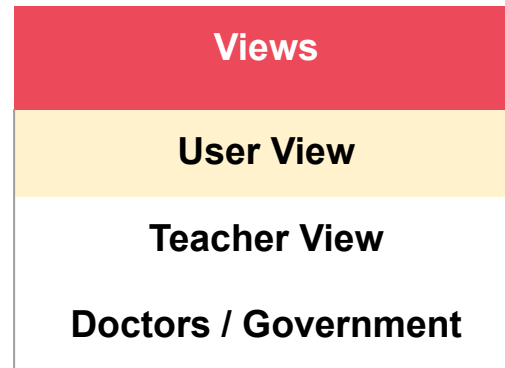
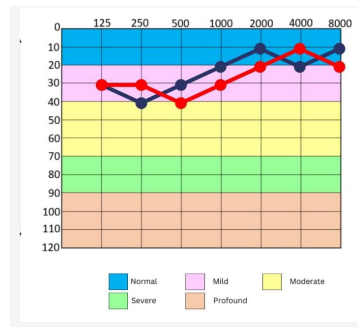
## Medical Diagnosis

- **Personalized Medical Attention**
  - Patient management
  - History of user tests
  - Easy to share options
- **Medical Research Database**
  - Bulk results (export to Excel)
  - Digital format





# User View

- **Improved Tutorials** with clear images
- Quick 3-step test
- Detailed graph with **labels**
- Share your results
- **Doctors near me**
- Dashboard - **Test Results History**
- **Noise pollution reporting**
- Legal Rules
- Test results based on ISO 389-7:2019 - Calibration of Audiometric Equipment



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Government of India

सत्यमेव जयते

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Air Quality Data +

Water Quality Data +

Noise Monitoring Data +

**Special Monitoring Data** Updated On : 19 Sep 2019

Ambient Noise Level in Vicinity of IGI Airport, New Delhi - 2004

Ambient Air and Noise Pollution Levels during Deepawali - A press Release


- ▶ Deepawali 2018
- ▶ Deepawali 2017
- ▶ Deepawali 2016
- ▶ Deepawali 2015
- ▶ Deepawali 2014



# 3-step process to check your hearing

17:22

17:22



Login

Mobile Number


Password

Login

Skip To Home

Don't have an Account? Sign Up here

Sign up



SIGN UP

User Type

Teacher

Teacher Name

Institute Name


Mobile Number

Password

Confirm Password

Sign Up

# USER SCREENS



Welcome

Enter Classroom Details

Enter

Self Test!

S

2023-12-20

Self Test

View Results

Start Test


Noise Data


Instructions

Legal Rules


Doctors Nearby

User Tutorial







Central Pollution Control Board



Maharashtra Pollution Control Board



Delhi Pollution Control Board



Rajasthan Pollution Control Board

Step 1

Login and validate your account

Click to authenticate and login

Mobile Number

Password

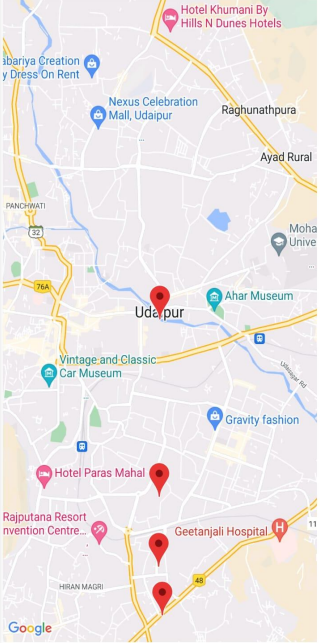
Login

Skip To Home

Click to signup as a new user


Don't have an Account? Sign Up Here


Sign up





# PRELIMINARY CHECKS


Make sure..


  
Quiet Place

  
Headphones

  
Notifications Off

  
Equalizer Neutral


  
No Talking

  
Noise-Cancel Off

Next



Check Your Surrounding



Test Confirmation

Low Noise Level Detected  
Average Decibels: -91.23 dB


STOP CONTINUE

Stop Recording

Continue



Which ear do you hear the sound in?



Play

Left

Right

Non..

# TEST IN PROGRESS (MASKED and UNMASKED)

## UNMASKED TEST

Can you hear the sound?

Progress

Right Ear



Threshold

1000...

▶ Replay

40 dB

Yes

No

## MASKED TEST

Can you hear the sound?

Progress

Left Ear



Threshold

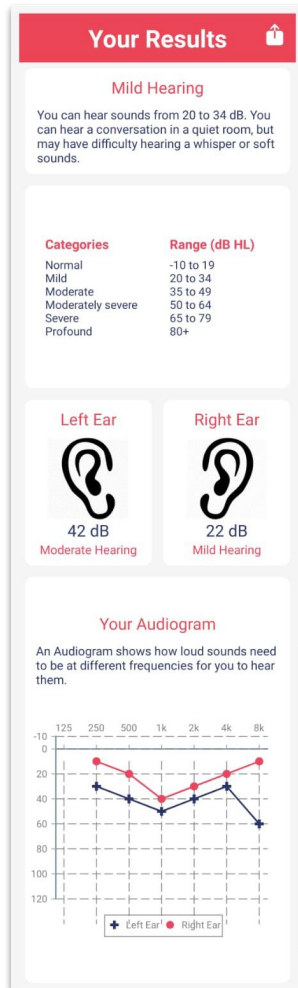
1000...

▶ Replay

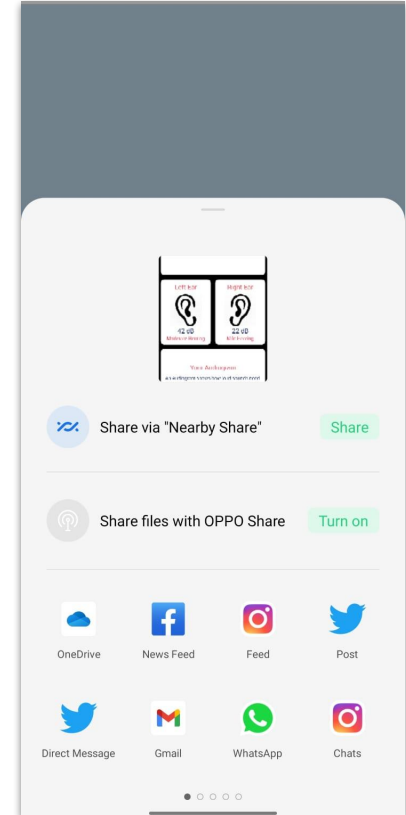
10 dB

Yes

No



## RESULTS



## Your Results

### Mild Hearing

You can hear sounds from 20 to 34 dB. You can hear a conversation in a quiet room, but may have difficulty hearing a whisper or soft sounds.

Categories	Range (dB HL)
Normal	-10 to 19
Mild	20 to 34
Moderate	35 to 49
Moderately severe	50 to 64
Severe	65 to 79
Profound	80+

### Left Ear



23 dB  
Mild Hearing

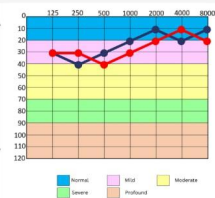
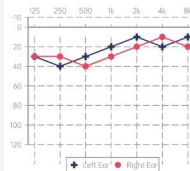
### Right Ear



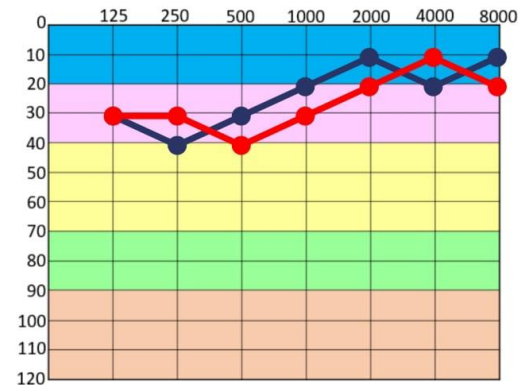
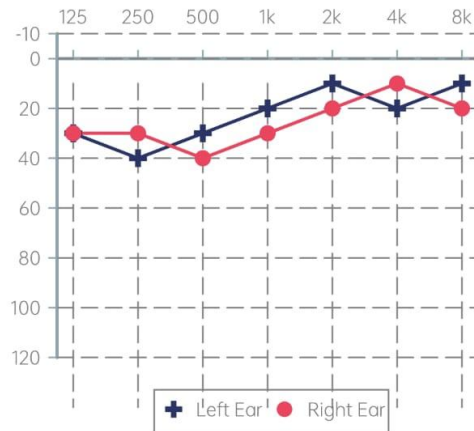
26 dB  
Mild Hearing

### Your Audiogram

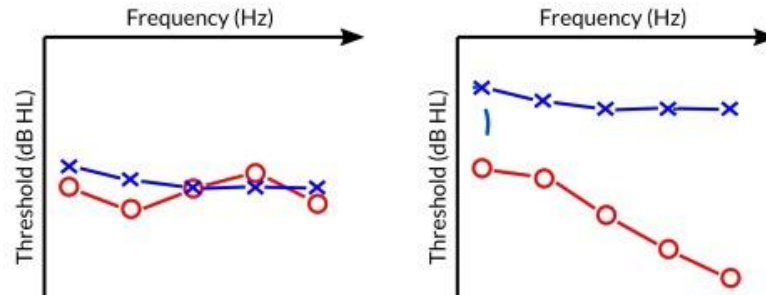
An Audiogram shows how loud sounds need to be at different frequencies for you to hear them.



# IMPROVED RESULTS



# Test Interpretation



MASKED	UNMASKED	Interpretation
Good	Good	Normal Hearing
Not Good	Good	Sensorineural loss in one ear
Good	Not Good	Possible ringing in ears
Not Good	Not Good	Improper Hearing



# Summary

## 5 A's

*Audiometry Analytics Available  
Anywhere Anytime!!!*



### Your Results



#### Mild Hearing

You can hear sounds from 20 to 34 dB. You can hear a conversation in a quiet room, but may have difficulty hearing a whisper or soft sounds.

Categories	Range (dB HL)
Normal	-10 to 19
Mild	20 to 34
Moderate	35 to 49
Moderately severe	50 to 64
Severe	65 to 79
Profound	80+

#### Left Ear



42 dB

Moderate Hearing

#### Right Ear

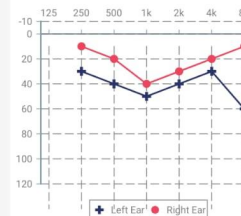


22 dB

Mild Hearing

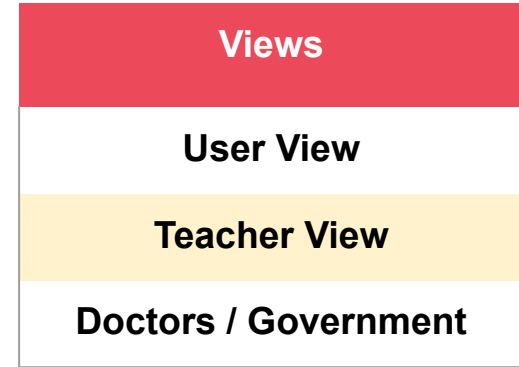
#### Your Audiogram

An Audiogram shows how loud sounds need to be at different frequencies for you to hear them.



# Teacher View

- Create Audio Rooms and Assignments
- Digital Records
- Test history for each student
- Analytics of individual results
- Consolidated class results

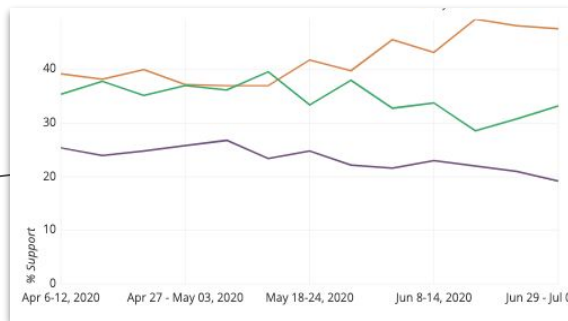


# Hierarchical Analytics

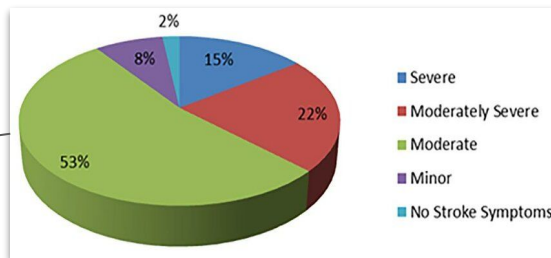
Profile  
Analytics



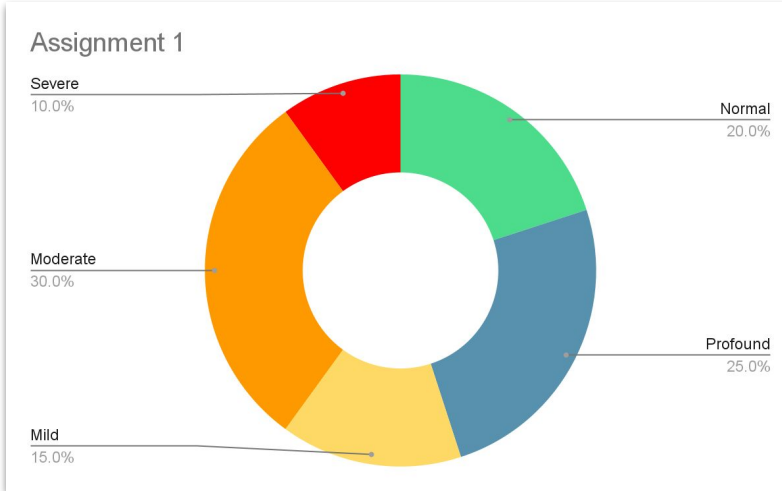
Classroom  
Analytics



Assignment  
Analytics



# Assignment Analytics

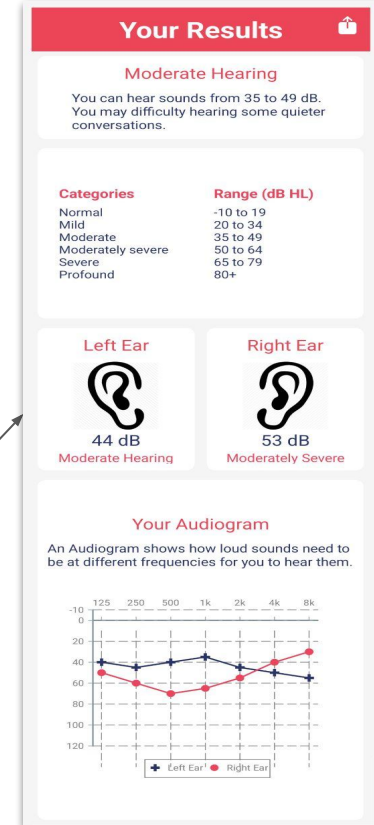


Age : 10

**SWAMI**

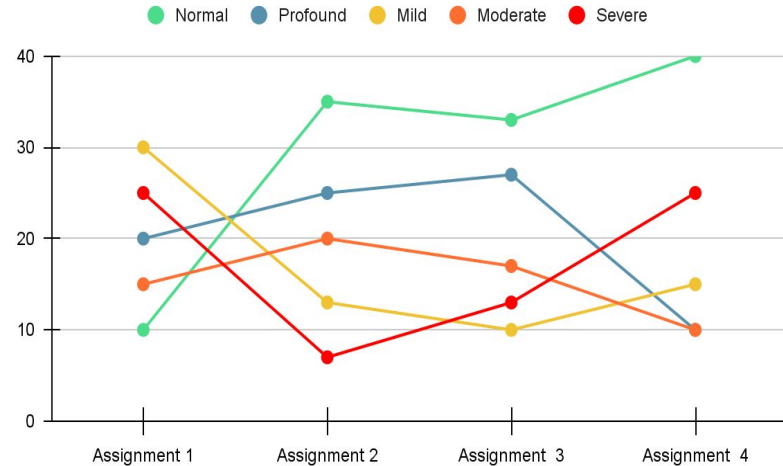
Gender: Male

[More Details](#)

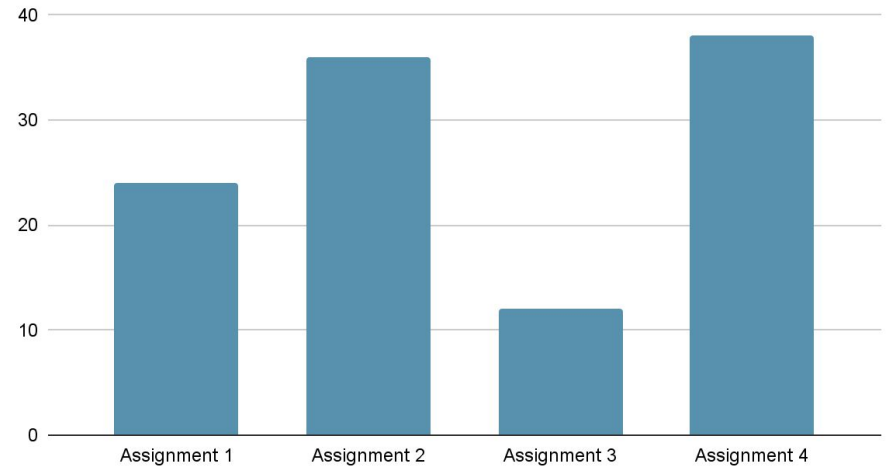


# Classroom Analytics


Severity



Number of Students that took the Test



# TEACHER SCREEN



Welcome  
Prof. Sachin  
IIT Tirupati

Date: 20-12-2023

### Create Classroom

Create Classroom

### Classrooms

5th Class


Classroom Strength: 30

6th Class

Classroom Strength: 30




### Assignments




**December 2023 Test**  
🔴 Deadline: 2023-12-25  
👤 Class Strength: 30  
✔ Progress: 20/30

📄 Copy Assignment ID




**November 2023 Test**  
🔴 Deadline: 2023-12-25  
👤 Class Strength: 30  
✔ Progress: 0/30

📄 Copy Assignment ID



**October 2023 Test**  
🔴 Deadline: 2023-12-26  
👤 Class Strength: 30  
✔ Progress: 0/30

📄 Copy Assignment ID



**Assignment2**  
🔴 Deadline: 2023-12-27T11:47:17Z  
👤 Class Strength: 30  
✔ Progress: 0/30

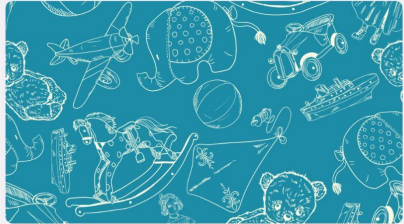
📄 Copy Assignment ID

### Create New Assignment

Create New Assignment



### Assignments



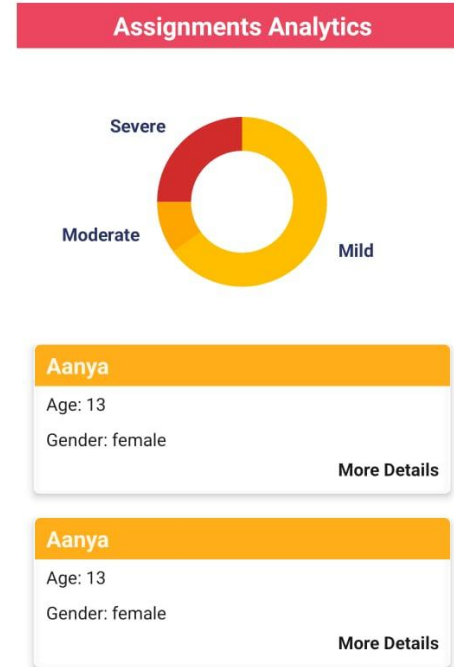
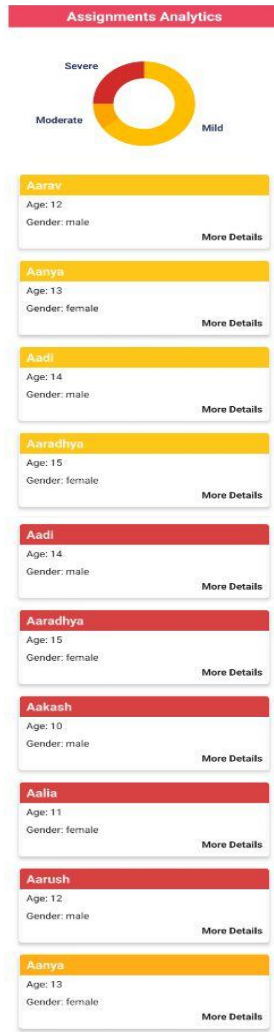
**December 2023 Test**  
🔴 Deadline: 2023-12-25  
👤 Class Strength: 30  
✔ Progress: 20/30

📄 Copy Assignment ID

### Create New Assignment

Create New Assignment

# Analytics

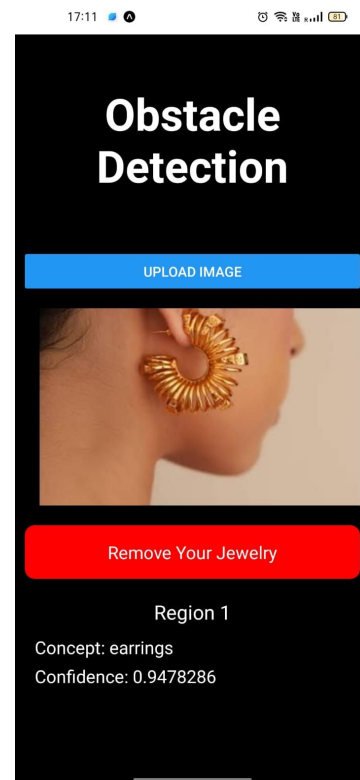


Results filtered  
based on severity

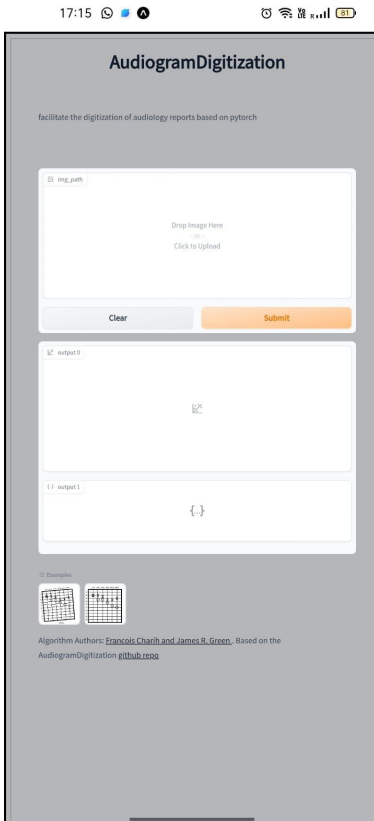


# Improvements

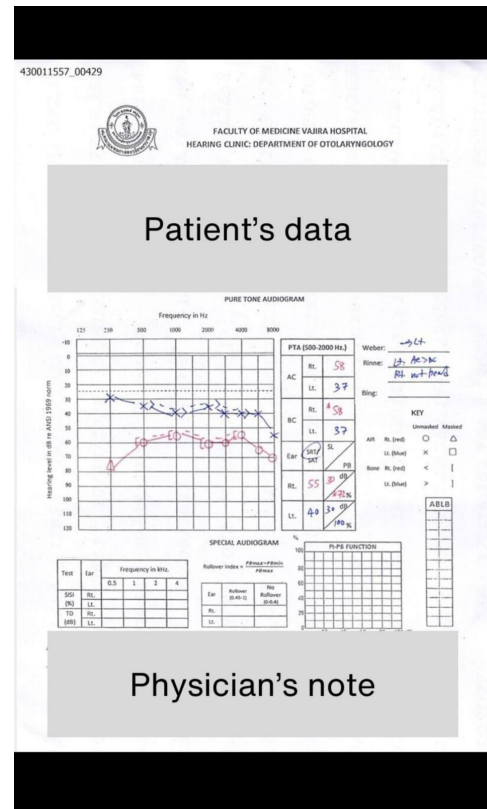
- Obstacle Detection
  - Alerts for obstacles that impede accurate assessment is crucial



# Improvements

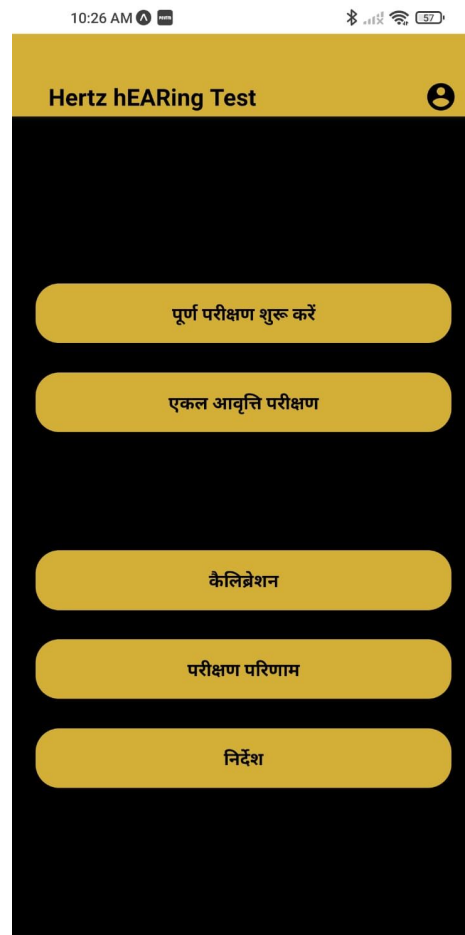


## Digitalization of report documents



# Experimental Features

- Multi-lingual support



# Impact

## 1. Industries

- a. Audio rooms → Industry Locations
- b. Assignments → For Quarterly Checkup

## 2. Institutions

- a. Audio rooms → Physical Classrooms
- b. Assignments → For Regular Checkup

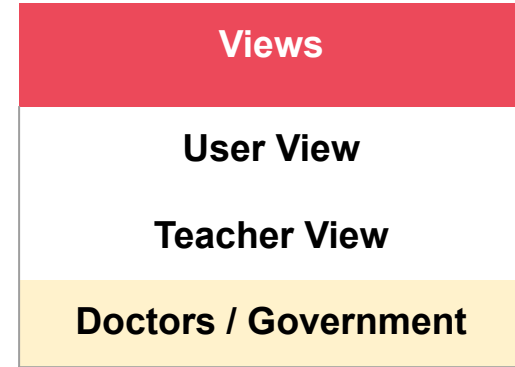
## 3. Doctors

- a. Audio rooms → Managing Set of Patients
- b. Assignments → directly getting results from patients



# Broader View

- **Doctors**
  - Checkup history of patients
  - Diagnose accurately
- **Industries & Government**
  - Test for occupational hazards
  - Analyze this data to know potential challenges
  - Monitor noise pollution data
  - Personalized hearing-aid



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Apps by CPCB | Jobs | Tenders | Publication | Technical Report | Annual Report

In Pursuit of Clean Environment

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Air Quality Data +

Water Quality Data +

Noise Monitoring Data +

Special Monitoring Data Updated On : 19 Sep 2019

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Ambient Air and Noise Pollution Levels during Deepawali - A press Release

- ▶ Deepawali 2018
- ▶ Deepawali 2017
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- ▶ Deepawali 2015
- ▶ Deepawali 2014

# Business Model

## Target Audience

- Concerned Users with ear issues
- ENT Doctors
- Schools
- **Industries with exposure to Noise**



# Business Model



## How to make it profitable

- ***Freemium Model***
  - Premium Tests under a paywall
  - Unlock detailed results and history
  - Daily users, Doctors
  - Connect with partnered ENT experts
  - Paid advertisements
- ***Enterprise Level Product and Service***
  - Selling software as a service
  - Industry as partner





# Business Model

## Go-to-Market Strategy

- **Product Focus**
  - User friendly features
  - Emphasizing accuracy by following ISO standards
  - Ease of use, and innovative features
  - Implement strong branding
  - User first policy

A green horizontal bar spans the top of the slide, and an orange vertical bar runs down the left side.

**THANK YOU**

# Appendix

# Hearing Level Classification

01	Normal	• upto 19 dB
02	Mild	• 20 to 40 dB
03	Moderate	• 35 to 60 dB
04	Moderately severe	• 50 to 80 dB
05	Severe	• 65 dB or greater
06	Profound	• 80 dB+

Ref: Olusanya BO, Davis AC, Hoffman HJ. Hearing loss grades and the *International classification of functioning, disability and health*. Bull World Health Organ. 2019 Oct 1;97(10):725-728. doi: 10.2471/BLT.19.230367. Epub 2019 Sep 3. PMID: 31656340; PMCID: PMC6796665.