

# Hackathon Problem Statements

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Important: Mask real names and personal identifiable information of persons with XXX XXX XXX if accidentally the data contains individual names, Aadhar no, Credit card no etc. We respect privacy.

Objective:

Riskcovry is a risk-profile based insurance provider. URL: <https://www.riskcovry.com/about>

In order to issue a risk based profile, we have to analyze healthcare data. This problem is towards solving that problem.

## General Instructions:

1. Select any one of the problem statements given below and execute the same.
2. Solutions to the problem statement can be represented using any basic User Interface (for presentation)
3. **Important:** The solution should be exposed as an public API (format of request and response is enclosed in Note(1.a) and Note(1.b)).
4. It is important to complete Point 3, because test cases would be run on the solutions and will be a factor of results and qualification(further details to be conveyed during hackathon)
5. There will be checkpoints before final submission during which each team needs to commit their changes to github(private repo) and share the same with organiser (further details to be shared during hackathon)

## Problem 1:

**Problem Domain:** Speech Analysis

**Solution to be demonstrated:**

1. Create a speech analysis module (Web Based) where certain questions such as below could be asked by the system(text form), and the specific intent of the answer should be displayed.

E.g.,

**Question:-** “Do you suffer from any health diseases?”

**Possible Speech Answers:-** “Yes, I suffer from Diabetes”, “Diabetes”, “No, i don’t have any diseases”, “I have heart disease and diabetes”, etc.

**Output Scenarios:-**

For UI - output can be presented in any way.

For API - Response (attached at the end (Note(1.a)))

**Question SET**

1. Do you suffer from any health diseases?
2. What’s your annual income?
3. What is your dob?

**Bonus:-** Users can have multiple ways of answering, try to cover most of the common intents.

## Problem 2:

**Prerequisite:** OCR-to-Text and AI tools; Any public library can be used as long as it is ethical to use it.

**Problem Domain:** Sentiment Analysis

**Problem:** Valid Hospital Discharge Summary Prediction

**Solution to be demonstrated:**

1. Create a module(API based) that takes a hospital discharge summary as an image or pdf and predicts whether it’s a valid summary or not.
2. Use any AI algorithm or library to provide the most accurate representation
3. Download hospital discharge summaries from the internet like an example attached below.(Note(1.c)).
5. Send Response as JSON given below(Note(1.b)).

**(Important:** Mask any name or personal information with XXX or 99999 as specified earlier)

**Bonus:** Collect as many varieties of negative images which can probably be classified as invalid hospital discharge summary

## Problem 1 Test cases:

Note(1.a)

**question: Do you suffer from any health diseases?**

case 1)

Request:

```
{
  "question_key": "q1",
  "options": ["Diabetes", "Thyroid", "Cancer"]
  "audio": base {} audio // "I have cancer and thyroid"
}
```

Response:

```
{
  "answers": ["Cancer", "Thyroid"]
}
```

case 2)

Request:

```
{
  "question_key": "q1",
  "options": ["Diabetes", "Thyroid", "Cancer", "Others", "None"]
  "audio": base {} audio // "I have no disease"
}
```

Response:

```
{
  "answers": ["None"]
}
```

case 3)

Request {

```
  "question_key": "q1",
  "options": ["Diabetes", "Thyroid", "Cancer", "Others", "None"]
  "audio": base {} audio // "I have Thyroid and High Blood pressure "
```

}

Response:

```
{
  "answers": ["Thyroid", "Others"]
}
```

case 4)

Request:

```
{
  "question_key": "q1",
  "options": ["Diabetes", "Thyroid", "Cancer", "None"]
  "audio": base {} audio // "I have High Blood pressure "
}
```

Response:

```
{
  "answers": []
}
```

**Question: What's your annual income?**

**Disclaimer: "All answers will be in lakh"**

case 1)

Request {

```
  "question_key": "q2",
  "options": ["<2lakh", "2lakh-5lakh", "5lakh-10lakh", "10lakh>"]
  "audio": base {} audio // "7lakh"
```

}

Response: {

```
  "answers": ["5lakh-10lakh"]
```

}

case 2)

Request {

```
  "question_key": "q2",
  "options": ["<5lakh", "5lakh-15lakh", "15lakh-20lakh", "20lakh>"]
  "audio": base {} audio // "3lakh"
```

}

Response: {

```
  "answers": ["<5lakh"]
```

}

**Question: "What is your dob?"**

**Disclaimer:"All the answers be DD/MM/YYYY format"**

case 1)

Request:

```
{  
  "question_key":"q3",  
  "options":[],  
  "audio": base {} audio // 23rd december 1998  
}
```

Response:

```
{  
  "answers":["23/12/1998"]  
}
```

case 2)

Request:

```
{  
  "question_key":"q3",  
  "options":[],  
  "audio": base {} audio // "22 10 1998"  
}
```

Response:

```
{  
  "answers":["22/10/1998"]  
}
```

case 3)

Request:

```
{  
  question_key:"q3",  
  options:[],  
  audio: base {} audio // "1998 10 22"  
}
```

Response:

```
{  
  "answers":["22/10/1998"]  
}
```

Note (1.b)

## **Problem 2 test cases:**

Case 1)

Request:

```
{  
  "discharge_summary_image": //base 64 encoded image  
}
```

Response:

```
{  
  "is_valid":true // boolean true or false  
}
```

Note (1.c)

Inova Fairfax Hospital Department of Medicine  
Suggested Discharge Summary Format  
(Modified from OU-Tulsa Department of Internal Medicine)

**Patient Name:**

**Admission Date:**

**Discharge Date:**

**Attending Physician:**

**Dictating Physician:**

**Admitting Diagnosis:**

**Discharge Diagnosis:**

**Principal discharge diagnosis** (reason for hospital stay after hospital assessment)

**Other discharge diagnoses** which were addressed during hospital stay (Complete list of active problems addressed during hospital stay)

**Consultations:** (name and specialty)

**Procedures:** (Name of procedure and concise description of results, only major studies)

**Complications (for primary and other discharge diagnoses):**

**History and Hospital Course:**

A concise summation of clinical course. Begins from time of admission with a brief summary (one paragraph) of key data from H&P. Then, use a problem-oriented approach by writing a separate paragraph for each problem title followed by a short synopsis of the evaluation, treatment and progress of each problem. Problems should match diagnosis above. Must describe to what the problem was attributed, the intervention(s) which occurred and the outcome.

Avoid a laundry list of lab values: For example, simply say, "Chest X-Ray was unremarkable; CBC, serum chemistries, were normal with the exception of elevated potassium of 6.3." Do include lab values that will be of use in clinic follow-up – e.g. HbA1C, lipid profile, TSH. Results of procedures documented under "procedures" can be referred to and do not need to be repeated.

**Discharge plan:**

**Condition upon discharge:**

**Activity:**

**Diet:**

**Date of next appointment and physician who will see patient**

**Medications at discharge:**

Do not simply state "resume home medications."

**Issues to be addressed at follow-up:**

**History and Hospital Course:**

A concise summation of clinical course. Begins from time of admission with a brief summary (one paragraph) of key data from H&P. Then, use a problem-oriented approach by writing a separate paragraph for each problem title followed by a short synopsis of the evaluation, treatment and progress of each problem. Problems should match diagnosis above. Must describe to what the problem was attributed, the intervention(s) which occurred and the outcome.

Avoid a laundry list of lab values: For example, simply say, "Chest X-Ray was unremarkable; CBC, serum chemistries, were normal with the exception of elevated potassium of 6.3." Do include lab values that will be of use in clinic follow-up – e.g. HbA1C, lipid profile, TSH. Results of procedures documented under "procedures" can be referred to and do not need to be repeated.

**Discharge plan:**

**Condition upon discharge:**

**Activity:**

**Diet:**

**Date of next appointment and physician who will see patient**

**Medications at discharge:**

Do not simply state "resume home medications."

**Issues to be addressed at follow-up:**

CC: Please instruct transcriber to cc all physicians who will follow up with the patient, especially the PCP.