

## **ANDROID APPLICATION**

### **Problem Statement 1:**

Make an application to help people to find places, not available on google maps, in their localities

- 1) It will Include things like:
  - Nearby washrooms
  - Tea Stalls
  - Cobblers
  - Various other local points
  - Exact details to find its location (GMaps integration for directions would be a plus)
  - Photograph of the Place
- 2) A form for users to submit places to be added in app
- 3) It will be a location-based application which will by default show places according to current location
- 4) The user can also search data of other location (as in Zomato app)
  - E.g. I am in Andheri and I need to search places in Borivali
- 5) A minimum data of 3 locations are expected
- 6) Each local point should have a page dedicated to basic information about the place

### **Problem Statement 2:**

Make an application that encourages people from all walks of life to participate for social and environmental causes in day to day life.

- 1) The application should notify users about upcoming social and environmental events.
- 2) The application should include an interface to connect to people with similar progressive mind sets.
- 3) Create your own innovative element that caters to engagement of people.

## WEB APPLICATION

### **Problem 1: NFC & QR Based Smart Shopping**

Description:

There are two types of shopping

- Traditional shopping - customers can see and touch the products and select the required products and roam around the departmental store with the products needs to be purchased.
- Mobile shopping - Using mobile applications user can purchase the products which they want to buy - disadvantage is user can't see the product and can't check the product quality of it.

Using this Web application - We can find the midway.

In this, When a customer enters a department-store they have to tap (NFC) or scan the QR or barcode through a website, the product will be added to the website cart 🛒.

After shopping, customer can proceed to checkout, once they submit from the website, the cash counter employees have to cross-verify the customer and then only customer can collect the items and make the payment.

### **Problem 2:**

Every individual comes across resubmission of the same documents to governments, college institutes and organizations at various phases of life. Authenticity of the documents is not always guaranteed, sometimes documents are forged.

Create an application that ensures all government documents from birth, education, employment till death are all in one single place. It should remove the hassle of all paper-based documentation and different online portals which are monitored separately.

## MACHINE LEARNING

### **Problem Statement 1: Image Crops Association**

The task is to identify associations between the provided crops and images. You will have to specify which crops appear in which locations in which image.

Expectation: 4 Outputs

1. JSON file (Dict) where the keys are image names, and the values are a list of tuples of crop names and their locations (specified by their left-top and right-bottom coordinates). If you are not able to find associations for either certain images or crops, please also include that.
2. Writeup discussing the approach, the rationale, merits and other possible approaches for the task.
3. Code used to solve the task. (Include requirement.txt for us to run the code and evaluate)
4. Evaluation - Write the evaluation code base on the sample test-set given. The evaluation metrics should include precision and recall calculation. Explain the metrics and observations in the writeup.

Example JSON Output:

```
{
  'image_name_1.jpg': [
    ['crop_name_1.jpg', [x1, y1, x2, y2]],
    ['crop_name_2.jpg', [x1, y1, x2, y2]],
  ],
  'image_name_2.jpg': [], # no crop association
  'NA': [ # no image association
    ['crop_name_1.jpg', []],
    ['crop_name_2.jpg', []]
  ],
  ...
}
```

(x1, y1) specify the left-top coordinates in the image

(x2, y2) specify the right-bottom coordinates in the image

Preferred: python

Allowed: C/C++

Test environment: Ubuntu 16.04

Dependencies: For python, include a requirements.txt with only the relevant packages. If any specific ubuntu packages are required (install-able through apt-get), please state so in the documentation.

Note: We will not be debugging the code if compilation fails.

#### Common Instructions:

Evaluation Criteria for tasks: (Please provide a small write-up with the following details)

- Write-up explaining your approach, assumptions and thoughts.
- Optimized code in terms of time & space complexity
- Code cleanliness
- Choice and explanation of data structures
- Visualizations, if possible
- Quality of output
- Bonus: Unit Tests.

#### **Problem Statement 2: Toxic comment classification over real social networking comments**

Online social networking and discussion platforms are an important space to communicate person's opinion and views on topics.

Intentionally obfuscated words, typos, slang and abbreviations are a particular challenge in toxic comment classification. The objective of this project is to classify sentence in various classes of toxicity.

The main objective of this project is to classify the sentences which has sarcasm, irony, slangs and typos in it too.

The dataset can be found here:

<https://www.kaggle.com/c/jigsaw-toxic-comment-classification-challenge>

Success Criteria will be:

- 1) Successful model deployment over Flask or Django or any of your choice and should have low latency in response.  
Accepted Response Time: 5 seconds or less
- 2) Should be able to predict toxicity on sentence containing typo, slangs, sentiments and intended typos.  
Some e.g.:  
"fucc ya nicca" should be identified as insult  
"I'm gay and that's not an issue" should not be classified as issue.
- 3) Should be able to identify Sarcasm and irony.  
For e.g.: "hope you're proud of yourself. Another milestone in idiocy."
- 4) Should be able to predict based on context or sentiment.

Preferred: python

Allowed: C/C++

Test environment: Ubuntu 16.04

Dependencies: For python, include a requirements.txt with only the relevant packages. If any specific ubuntu packages are required (install-able through apt-get), please state so in the documentation.

Note: We will not be debugging the code if compilation fails.

Common Instructions:

Evaluation Criteria for tasks (Please provide a small write-up with the following details):

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- Optimized code in terms of time & space complexity
- Code cleanliness
- Choice and explanation of data structures
- Visualizations, if possible
- Quality of output
- Bonus: Unit Tests.

Note: Anyone found copying Kaggle kernel solutions will be disqualified.

## **BLOCKCHAIN**

### **Problem statement 1: Blockchain based B2B selling platform**

Blockchain based Business to Business selling platform for agricultural products. Products can be of all types, from machines used for agriculture to final produce being sold to market entities.

For various machines establish a smart contract for lending them to other farmers.

### **Problem Statement 2: Blockchain based traceability system**

Build a traceability system using blockchain for farmer's produce from the farms to the consumers.

Flow:-

Farms - Pack houses - Warehouses - Cold Storage management - Shipping - Traders/Buyers/Sellers - Consumers

(One or more parties between Farmers and Consumers may not be present in the flow)

Manage tie ups using Smart Contracts and transactions via Escrow.

## **INTERNET OF THINGS**

### **Problem statement 1**

Problem - In a lot of empty streets/parking areas the street lights are on throughout the night even when not needed, this results in the consumption of excess electricity which can be saved.

What is needed –

‘A smart solution where the lights are at around 40 to 50% of their brightness, and when somebody(a person/car/animal/bike/etc) enters the area only the lights ahead, on top and behind that body should be at 100% brightness and that should happen as they body progresses in that direction.’

Field of application - Smart cities, Parking lots, Street lighting

### **Problem Statement 2**

Problem - A lot of plants at homes or offices die because of improper care and not being maintained properly, and eventually have to be thrown away or replaced.

What is needed –

‘An automated system with a set of sensors, that will indicate the various factors of the soil and the plant on an app, and notify and inform the user that the important factors are going down and need to be attended and the actions that need to be taken based on the sensor readings.’

Examples -

- The user has to be notified that the plant needs more light, based on the luminosity sensor reading, and suggest the user that the plant may need to be repositioned
- The user should get a notification that the plant has to be watered by monitoring the moisture in the soil.

Field of application – Agro-Tech, home gardening