UDYAM'22

MOSAIC

PROBLEM STATEMENT

Round 1

CAPTCHAs (Completely Automated Public Turing Tests to Tell Computers and Humans Apart) are something that almost every internet user has encountered. Many users are presented with strange-looking, stretched, fuzzy, coloured, and shape distorted visuals that look more like a Dali painting than English text while signing in or creating an account, making an online purchase, or even publishing a comment.

With the growth of Artificial Intelligence, Machine Learning and Computer Vision, the need for strong captchas has increased, so that Computer Vision models are unable to automatically detect these captchas.

This year's Problem Statement for round 1 is based exactly on this. Handwritten Captcha Detection. Your task is to automatically detect what is written in the Captcha given to you. Generally simple captchas consist of numbers and letters in a distorted format, but there is a twist to the PS. Instead of numbers, the captcha will consist of letters and emojis (from a predefined set - the link to which is given in the resources).

The captcha will consist of handwritten letters and emojis written with black ink on a white paper. There'll be bonus points for additional features, such as handling distorted and rotated images, or removing noise in the captcha before detection.

You have to map the emojis in the captcha to numbers, i.e. when you print the output, you need to print the number corresponding to the emoji detected in the captcha,

The mapping will be as follows:

Checkmark : 1

Cloud: 2

Croissant: 3

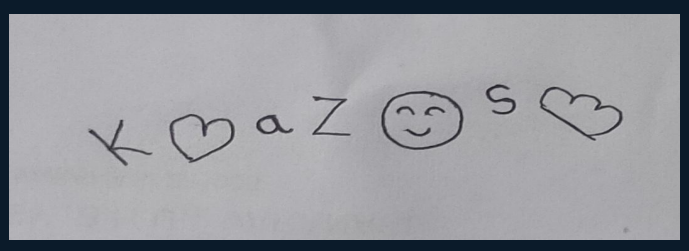
Heart: 4

Laugh: 5

Smile: 6

Sun: 7

An example:



Captcha image

Expected Output

"K4aZ6S2"

Correct Answer

Evaluation:

All teams will provide us with their character set before evaluation. We would test your model on various images in increasing order of difficulty.

For a captcha of length 'x', the total points will be given as follows if the captcha is recognized **correctly** :

1) 2*x for Character Set size >= 10
2) 3*x for Character Set size >= 15
3) 4*x for Character Set size >= 20
4) 5*x for Character Set size > 25

(The character set here must contain all 7 emojis)

+5 to +20 Bonus points will be awarded for each innovative feature implemented in the Solution. Points to be given will be strictly decided by co-ordinators.

Note: A letter/ emoji is also a captcha of length 1.

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Submission Instructions:

1) The deadline for the PS submission is 2nd April 23:59 pm.
2) Each team has to mail the following files in a folder to mosaic22.udyam@gmail.com (don't forget to give access to your files on this mail id)

- **main.py** file which would take emonji.jpg as input and give the corresponding output.
- **character.txt** file for the character set chosen
- **model.h5** file for the trained model.

3) The subject of the mail should be in the format **TeamName_Round1**.
4) Only one submission per team will be accepted.
5) Any additional feature if made needs to be clearly mentioned in the mail..

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Rules/Guidelines for submission

1) The organizers reserve the right to change the rules as they deem fit. Change in any rules, if any will be notified on the Website and the Whatsapp and Discord groups.

2) Each team's code will be verified by coordinators and should not be a complete match to others. In case of Suspected cheating, the team will be immediately disqualified.

3) The participation certificate will be awarded to teams scoring a total of at least 5 points.

Dataset:

kaggle.com/datasets/crawford/emnist

https://drive.google.com/drive/folders/1sw0XVroXFhJoNAJVj40qE7ZOPSBzve7u

Note: Total score = Score in Round 1 + Score in Round 2

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