CAPTCHA ALTERNATIVE FOR VISUALLY IMPAIRED

TECHNOLOGY BUCKET : MISCELLANEOUS

TEAM NAME : OPTICAL ILLUSION

MINISTRY NAME : DTE OF IT AND CYBER SECURITY, DRDO

TEAM LEADER: APOORV GARG

PROBLEM STATEMENT : CAPTCHA ALTERNATIVE FOR VISUALLY IMPAIRED

PROBLEM STATEMENT NUMBER : CK146

COLLEGE CODE : 068

OBJECTIVE

TO HAVE AN ALTERNATE SOLUTION FOR CAPTCHA AUTHENTICATION PROCESS FOR THE VISUALLY IMPAIRED CITIZENS AS MANY TIMES THEY FIND A PROBLEMS AND DIFFICULTIES IN CAPTCHA AUTHENTICATION PROCESS AND ARE UNABLE TO DECIPHER IT.

- **PRESENT MODES USED FOR CAPTCHA :** TEXT, AUDIO AND IMAGES ARE GENERALLY USED FOR CAPTCHA TODAY.
- TEXT AND IMAGES CANNOT BE VISUALIZED BY VISUALLY IMPAIRED USERS.
- AUDIOS ARE GENERALLY HARD TO DECIPHER.

- **WORKING** : THE PROJECT MODEL IS BASED ON THE GENERATION OF THE SCRIPT THAT A VISUALLY IMPAIRED CITIZENS ARE ABLE TO READ i.e. BRAILLE SCRIPT.
- THERE WILL BE TWO VERSIONS OF THE SITE ONE FOR THE VISUALLY IMPAIRED WHICH WILL BE AN INTERACTIVE ONE (TEXT-TO-VOICE SPEECH) AND THE OTHER ONE FOR NORMAL USERS .
- THE SITE FOR THE BLIND USERS WILL RECEIVE THE CAPTCHA WITHIN THE JAVASCRIPT IN ENCRYPTED FORM.
- A C CODE AS A PART OF ARDUINO UNO WILL EXTRACT THAT ENCRYPTED CAPTCHA FROM JAVASCRIPT, DECRYPT IT AND CONVERT IT INTO A BRAILLE SCRIPT AND THEN FEED IT TO THE HARDWARE i.e. THAT CAPTCHA WILL ONLY WORK FOR THE PEOPLE WITH THAT HARDWARE.
- THE HARDWARE CONNECTED TO ARDUINO UNO WILL FORM AN IMPRESSION OF CAPTCHA CHARACTERS TO BRAILLE SCRIPT (MATRIX OF 3×2).
- THE GENERATED BRAILLE SCRIPT WILL FORM IMPRESSION ON THE HARDWARE PLATE WHICH WILL EFFECTIVELY BE USED BY VISUALLY IMPAIRED TO READ THE BRAILLE SCRIPT i.e. THEY ACTUALLY HAVE THE CAPTCHA TEXT WITH THEM.

TECHNOLOGY STACK

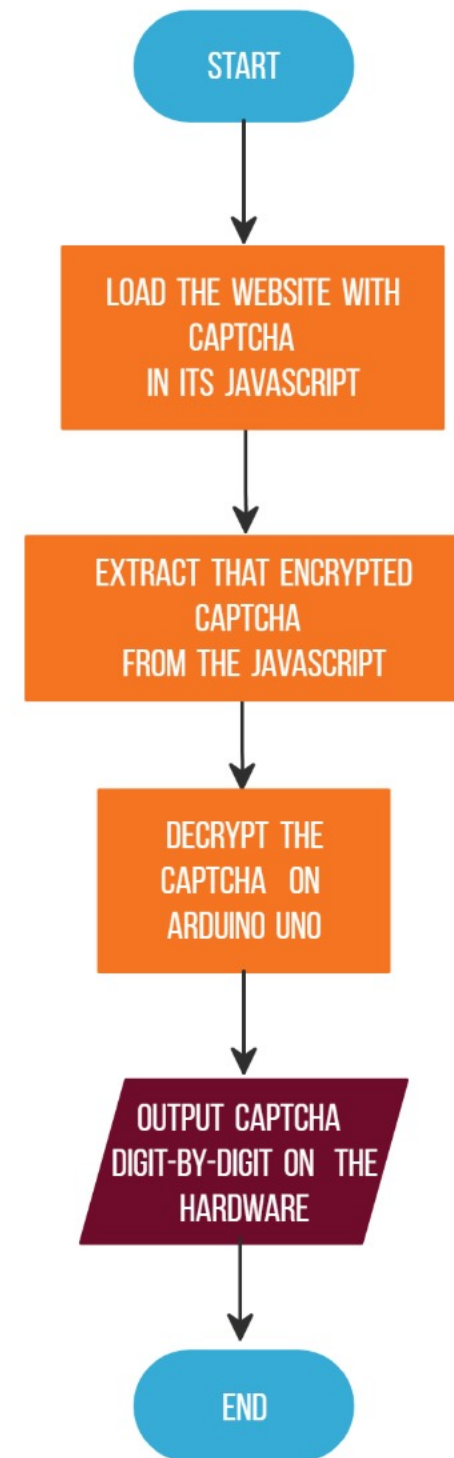## SOFTWARE

- **WEB BASED INTERFACE (DUMMY) :** IT WILL USE:

- HTML, CSS USED FOR USER INTERFACE OF WEBSITE.

- JAVASCRIPT WILL CONTAIN THE ENCRYPTED CAPTCHA AND WILL HELP IN USER INTERACTION THROUGH TEXT TO VOICE.

- **PYTHON CODE (AS AN INTERMEDIATE):** PYTHON WILL HELP IN EXTRACTION OF THE CAPTCHA CODE FROM THE JAVASCRIPT(SELENIUM LIBRARY).

- IT WILL ALSO HELP TO SEND DIGITS TO ARDUINO UNO(SERIAL LIBRARY).

HARDWARE

- **ARDUINO UNO :** TEXT CONVERTER

- THIS WILL BE USED AS A INTERMEDIATE BETWEEN BRAILLE HARDWARE AND PYTHON CODE.

- THE DECRYPTION OF CAPTCHA WILL TAKE PLACE HERE.

- **HARDWARE FOR IMPRESSION OF BRAILLE SCRIPT :**

- THE PROCESSED CAPTCHA TEXT WILL HAVE AN IMPRESSION ON THIS DEVICE.

- THIS WILL BE USED BY BLIND USERS TO READ THE CAPTCHA TEXT EFFECTIVELY IN BETTER WAY.

FLOW CHART

USE-CASES

- FOR THE USE OF VISUALLY IMPAIRED USERS.
- FOR THE USE OF INSTITUTE OF BLIND PEOPLE.

FUTURE SCOPES

- THIS PROJECT MODEL CAN BE LATER EXTENDED TO A BOOK READER FOR VISUALLY IMPAIRED.
- HERE WE CONNECT THE SCANNER CAMERA WITH THE HARDWARE DEVICE WHICH WILL THEN CONVERT THE BOOK TEXT TO BRAILLE TEXT.

DEPENDENCIES

- ARDUINO UNO REQUIRES 7V-1A SUPPLY FOR PROPER FUNCTIONING OTHERWISE THE SYSTEM WOULD NOT WORK.

ASSUMPTIONS

- THIS PROTOTYPE MODEL ASSUMES THAT THE DIGITS 0-9 WILL BE USED FOR CAPTCHA.

THANK YOU !!!