PUNE INSTITUTE OF COMPUTER TECHNOLOGY, PUNE

ACADEMIC YEAR: 2023-24

DEPARTMENT OF COMPUTER ENGINEERING DEPARTMENT

CLASS: B.E. **SEMESTER: I**

SUBJECT: LP-IV

ASSIGNMENT NO.	A2
TITLE	**Implement a program to generate and verify CAPTCHA image.**
PROBLEM STATEMENT /DEFINITION	Write a program to implement a program to generate and verify CAPTCHA image
OBJECTIVE	1. Understand the use of CAPTCHA Image. 2. Generation and Verification of it.
OUTCOME	Students will be able to - 1. Captcha offers security against websites suffering from spams. 2. To Preventing Fake Registrations 3. To ensure that an end user is human or machine
S/W PACKAGES AND HARDWARE APPARATUS USED	Windows 10 (64-bit), Intel I5 4GB RAM 256 GB SSD, Python 3.9.0, VS Code
REFERENCES	1. https://dsrajnor.files.wordpress.com/2022/09/assignment-2-captcha.pdf 2.https://www.askpython.com/python/examples/python-captcha-generator
STEPS	Refer to theory, algorithm, test input, test output
INSTRUCTIONS FOR WRITING JOURNAL	1. Date 2. Assignment no. 3. Problem definition 4. Learning objective 5. Learning Outcome 6. Concepts related Theory 7. Algorithm 8. Test cases 9. Conclusion/Analysis

Prerequisites:

Concepts related Theory:

1. **Introduction:** A CAPTCHA (an acronym for "Completely Automated Public Turing test to tell Computers and Humans Apart") is a type of challenge-response test used in computing to determine whether or not the user is human. The most common type of CAPTCHA was first invented by Mark D. Lillibridge, Martin Abadi, Krishna Bharat and Andrei Z. Broder. This form of CAPTCHA requires that the user type the letters of a distorted image, sometimes with the

addition of an obscured sequence of letters or digits that appears on the screen. Because the test is administered by a computer, in contrast to the standard Turing test that is administered by a human, a CAPTCHA is sometimes described as a reverse Turing test. Actually CAPTCHA is used as a simple puzzle hurdle, which restricts various automations.

2. Examples:

```
CAPTCHA: x9Pm72se

Input: x9Pm62es

Output: CAPTCHA Not Matched


CAPTCHA: cF3yl9T4

Input: cF3yl9T4

Output: CAPTCHA Matched
```

The set of characters to generate CAPTCHA are stored in a character array chrs[] which contains (a-z, A-Z, 0-9), therefore size of chrs[] is 62.

To generate a unique CAPTCHA every time, a random number is generated using rand() function (rand()%62) which generates a random number between 0 to 61 and the generated random number is taken as index to the character array chrs[] thus generates a new character of captcha[] and this loop runs n (length of CAPTCHA) times to generate CAPTCHA of given length.

3. Why do we Prefer Captcha rather than other security measures?

1. To Protect Website's Registration Forms – Many Websites like Hotmail, Gmail, Yahoo, Facebook etc. offer free registration. It is necessary to protect these website's registrations so that it ensures the registered user is a human not a program or bot. Captcha Code is used to protect the Registration Form Submission Programmatically

2. To Prevent Comment Spams in Blogs – Captcha Code is used in the comment form so that only humans can comment on a post otherwise spammers can flood hundreds of comments to a single post.

3. To Protect Email Address Scrapping – Spammers crawl the web in the search of Email address posted in the clear text (e.g. email@website.com). You can protect your email address either by using Captcha to hide the email address, one can solve the Captcha before showing the Email address or by using an alternative trick to post an Email Address in the format of email at website dot com.

4. To Protect from Search Engine Bots – Many Html tags are available to specifying indexing condition to Search engine bots. To prevent a website or specific webpage from search engine crawling, it is desirable to use.

Advantages:

1. Distinguishes between a human and a machine

2. Makes online polls more legitimate

3. Reduces spam and viruses

4. Makes online shopping safer

5. Diminishes abuse of free email account services

Disadvantages:

1. Sometimes it is very difficult to read

2. Are not compatible with users with disabilities

3. Time-consuming to decipher

4. Technical difficulties with certain internet browsers

5. May greatly enhance Artificial Intelligence

4. Algorithm:

1. First declare and define the checkCaptcha() function that takes two string parameters and returns a boolean value.
2. Within the checkCaptcha() function, compare the two string parameters using the compare() function and return true if they are the same; otherwise, return false.
3. Declare and define the generateCaptcha() function that takes an integer parameter and returns a string value.
4. Within the generateCaptcha() function, initialize a time variable using the time() function and seed the random number generator using the srand() function.
5. Declare a character array containing all the characters to be included in the CAPTCHA and assign it to a char pointer variable.
6. Generate a random CAPTCHA string of the specified length by repeatedly appending random characters from the character array to a string variable using the push_back() function.
7. Return the generated CAPTCHA string.
8. Within the main() function, declare a string variable named captcha and call the generateCaptcha() function with a length of 9 to generate a random CAPTCHA string.
9. Print the generated CAPTCHA string on the console.

Conclusion: Hence we conclude that CAPTCHA is used to distinguish Human and Machine and Provide Security to Programs.

Review Questions:

Q1.What is CAPTCHA actually used for?

Q2. How to generate CAPTCHA?

Q3.What is a CAPTCHA example?

Q4. What information does CAPTCHA collect?