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# Software Requirements Specification for<Captcha Solver>

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Version 0.4 approved

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## Table of Contents

Meeting No. 1.....	3
Meeting No. 2.....	4
Meeting No. 3.....	5
Meeting No. 4.....	6
Meeting No. 5.....	7
Meeting No. 6.....	9
Meeting No. 7.....	10
Meeting No. 8 .....	11

## Meeting No. 1

<b>Group No</b>	11
<b>Meeting Date</b>	February 1,2018
<b>Meeting Time</b>	5:30 PM
<b>Duration</b>	Total 60 min
<b>Location</b>	Mentor's office
<b>Meeting Person</b>	Meeting with Mentor

#	Group Members	Present
1	Naveed Hakim	P
2	Hamza Safdar	P
3	Khizar Farooq	P
4	Muhammad Nabeel	P

Summary
<p>We were quite confused regarding selection of our SEGP project. We had few ideas but we wanted to finalize the field where u will work. After meeting with mentor we came to a conclusion that we are going to work in the field of captcha. The first important thing after selecting the project was Platform. We had two options in which we can do work. Python and Mat lab. We selected Mat lab tool for our project by recommendation of our mentor. The second thing after selecting our project was to look for the scope of the project and its intended audience. Scope of the project was to provide a software which can solve a captcha. An image will be given to software and it will give a textual form output on graphical user interface and the targeted audience was people who are fond of quotes and those are looking for robots to break captcha's. After selecting all this, now the first agenda was to get familiar with the syntax of that tool we selected.</p>

**Agenda:** - Agenda was to get familiar with the syntax of that tool we selected.

## Meeting No. 2

<b>Group No</b>	11
<b>Meeting Date</b>	21 February 2018
<b>Meeting Time</b>	1:30 PM
<b>Duration</b>	30 min
<b>Location</b>	Library
<b>Meeting Person</b>	Group Meeting

#	Group Members	Present
1	Naveed Hakim	P
2	Hamza Safdar	P
3	Khizar Farooq	P
4	Muhammad Nabeel	P

### Summary

After that successful meeting with mentor, we decided to arrange a meeting for ourselves just to start proceedings. We discussed that every member should install the tool Mat lab. We began to find tutorials about Mat lab and the field in which we were working (image processing). We found some stuff by Mubarak shah. We decided to listen to him. Further we discussed the expertise of each other in relevant field. Moreover, we discussed the overall flow of making of this software and did some brain storming that how our software will look like.

**Agenda:-** Tutorials about image processing.

## Meeting No. 3

<b>Group No</b>	11
<b>Meeting Date</b>	2 March 2018
<b>Meeting Time</b>	12:00 PM
<b>Duration</b>	30 min
<b>Location</b>	Mentor's office
<b>Meeting Person</b>	Meeting with Mentor

#	Group Members	Present
1	Naveed Hakim	P
2	Hamza Safdar	P
3	Khizar Farooq	P
4	Muhammad Usman	P
5	Muhammad Nabeel	P

Summary
<p>The main motto of this meeting with mentor was to get the work up and running. The mentor advised us to get familiar with syntax as soon as possible. The real work was started when mentor gave us the blog to read and search how Build in OCR works. This was the same project done by someone else along with complete documentation. Mentor advises us to understand each step of that function so that it can help us in our project. Moreover, we took guidance for prototyping from mentor. Everyone shared his opinion of how prototyping should be done.</p>

**Agenda:** - The utmost agenda of this meeting was to understand basic functionality of OCR.

## Meeting No. 4

<b>Group No</b>	11
<b>Meeting Date</b>	16 March 2018
<b>Meeting Time</b>	12:00 PM
<b>Duration</b>	30 min
<b>Location</b>	Mentor's office
<b>Meeting Person</b>	Meeting with Mentor

#	Group Members	Present
1	Naveed Hakim	P
2	Hamza Safdar	P
3	Khizar Farooq	P
4	Muhammad Nabeel	P

### Summary

As we have started working on our project so we arranged a meeting to show our work to mentor. We were learning how OCR works. We discussed the problems we faced in that OCR and mentor guided us to get through those constraints. Next part was to collect data set of each alphabet as we need different set of each letter like italic, bold so that software should compensate letters that are bit of out of shape too. Moreover, mentor told us to apply filters because some images are not quite clear, by applying filters we can extract text rather easily. Agenda of meeting was to apply filters on different data sets

**Agenda:-** Agenda of meeting was to apply filters on different data sets.

## Meeting No. 5

<b>Group No</b>	11
<b>Meeting Date</b>	23 March 2018
<b>Meeting Time</b>	12:00 PM
<b>Duration</b>	30 min
<b>Location</b>	Mentor's office
<b>Meeting Person</b>	Meeting with Mentor

#	Group Members	Present
1	Naveed Hakim	P
2	Hamza Safdar	P
3	Khizar Farooq	P
4	Muhammad Nabeel	P

Summary
<p>After collecting the data set of each alphabet we arranged another meeting with mentor. Mam Ambreen guided us to work on one alphabet first then go on to whole string. We converted image into grey scale and in binary with the help of MATLAB built in functions as recommended by our mentor. The next step was to deal with image properties. We used two image properties. Finding the centroid of character of an image and find X, Y points and width and height of a character in that image. The purpose of doing this was to create a bounding box on a character so that it can only take the information (find a complete character, neglect what's around) which we want from that image.</p>

**Agenda:-** Agenda of this meeting was to create bounding box.



## Meeting No. 6

<b>Group No</b>	2
<b>Meeting Date</b>	30 March 2018
<b>Meeting Time</b>	2:15 PM
<b>Duration</b>	15 min
<b>Location</b>	Mentor's office
<b>Meeting Person</b>	Meeting with Mentor

#	Group Members	Present
1	Naveed Hakim	P
2	Hamza Safdar	P
3	Khizar Farooq	P
4	Muhammad Nabeel	P

Summary
<p>This was another meeting held with Mam Ambreen. The purpose of this meeting was to learn line detection with the help of Hough transform. Mentor told us a method available in MATLAB that provides starting and ending points of all lines which are in a character. She assigned us this task to look for this method, learn how it works and implement this on a single character. Further we discussed what to do next? Mentor told us to we have to deal with strings instead of a single character and the last step will be neural network.</p> <p>.</p>
<p><b>Agenda:-</b> Agenda of meeting was to detect lines with Hough transform</p>

## Meeting No. 7

<b>Group No</b>	11
<b>Meeting Date</b>	6 April 2018
<b>Meeting Time</b>	12:00 PM
<b>Duration</b>	25 min
<b>Location</b>	Mentor's office
<b>Meeting Person</b>	Meeting with Mentor

#	Group Members	Present
1	Naveed Hakim	P
2	Hamza Safdar	P
3	Khizar Farooq	P
4	Muhammad Nabeel	P

Summary
<p>After learning line detection with the help of Hough transform, we all sat together to discuss the next step for the progression of our project. We had extracted all features of a character by using different technique like its centroid, X and Y points, height and width, detecting lines. Now the motto of discussion was where to store all these features, some of us were giving an idea to save all this information in an excel sheet and some of us wanted to save this information in a variable. A healthy conversation between all of us came to an end when we decided to store this information in a variable. Everyone was comfortable at the end by this decision.</p>

**Agenda:-** Agenda of meeting was to store all features in a variable.

## Meeting No. 8

<b>Group No</b>	11
<b>Meeting Date</b>	16 April 2018
<b>Meeting Time</b>	9:00 PM
<b>Duration</b>	25 min
<b>Location</b>	Study Room
<b>Meeting Person</b>	Meeting with Mentor

#	Group Members	Present
1	Naveed Hakim	P
2	Hamza Safdar	P
3	Khizar Farooq	P
4	Muhammad Nabeel	P

Summary
<p>This was our last meeting with our mentor. It was very crucial meeting as we arranged this meeting to learn neural network. Mentor fully explained us about neural network including definition, concept and the role in our project. Neural network has significant role in our project as it will take decision on the basis of all features which will be provided by us to neural network. Moreover, mentor told us about the combination of different layers that will play the final role in decision making. Further we talked about how neural network should be trained and how we can take accuracy whole on top.</p>

**Agenda:-** Agenda of meeting was to finalize our project and train with neural network