



DSP MINI PROJECT

Certificate generation Using Matlab

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Aim:

To develop a program using MATLAB that can automatically generate certificates for participants of an event or course.

Software used:

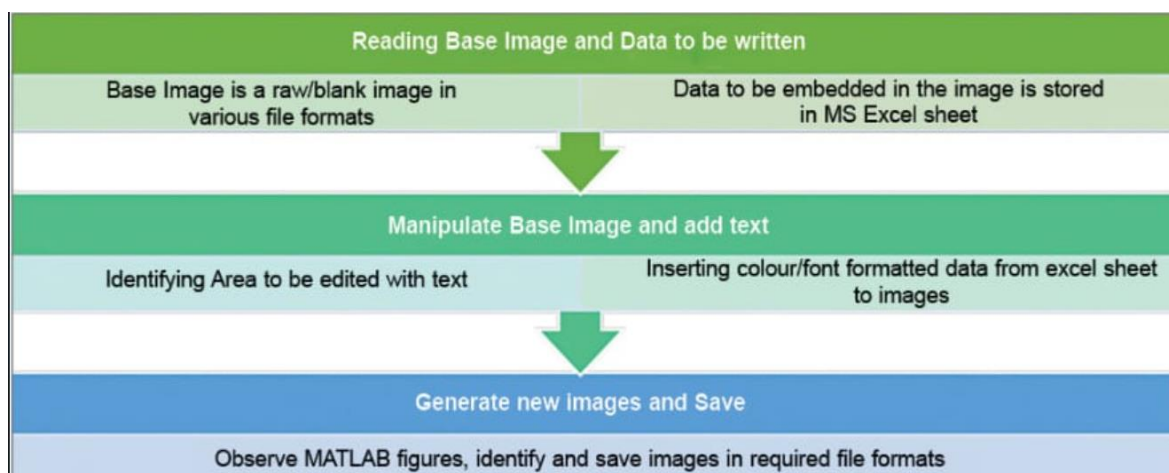
Matlab

Theory:

MATLAB is a tool that is used for various purposes like simulation, creating GUI applications, performing complex analysis, image processing and many more. In this project we write a MATLAB code to generate certificates for workshops, conferences.

Here, in this code We use File name of the blank certificate as input . We obtain the details to be written on the certificate from an Excel sheet and write the data on the blank certificate and many such certificates are generated by the MATLAB code . These certificates generated by the matlab code can be saved in a folder with a unique file name.

Steps involved in the project:



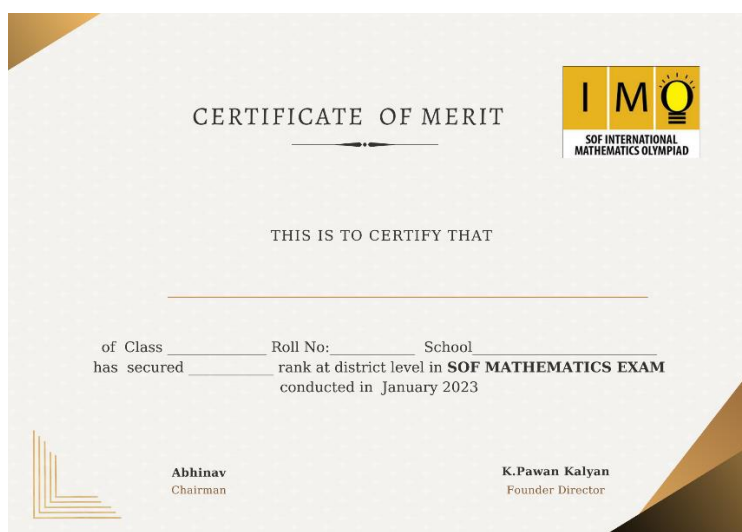
Description of functions we used in this code:

1. `[num,txt] = xlsread(filename)` reads the numeric data, text data from the Excel file.
2. `A = imread(filename)` reads the image from the file specified by filename, inferring the format of the file from its contents. If filename is a multi-image file, then `imread` reads the first image in the file.
3. `RGB = insertText(I,position,text)` returns a truecolor image with text inserted. The input image, `I`, can be either a truecolor or grayscale image.
4. `imshow(RGB)` displays the truecolor image `RGB` in a figure.

Procedure:

1. We create a sample certificate using canvas and save it as 'sample_certificate.png' in the MATLAB folder.

Sample_certificate:



2. We collect the students data in an excel sheet and save it as 'student_details.xls' .This excel sheet contains columns like Student Name,Class,Roll.No, School name and secured rank.

Excel Sheet :

	A	B	C	D	E	F
1	SI No	Student Name	Class	Roll.No	School	Rank
2	1	K.Ram Charan	Four	B123	HVS	First
3	2	P.Devendhar	Eight	C157	SRM	Fifth
4	3	Karthikeya	Ten	A986	Jaya	Sixth
5	4	Sidharth	Seven	B234	KKR	Third
6	5	Sidnaaz	Six	D753	Model	First
7	6	Suresh	One	A369	KKR	First
8	7	Satya	Five	C233	DBMS	Third

3. We write the code to take data from excel sheet and generate certificates.
4. We read/load the sample_certificate image using imread() and extract data from excel sheet to insert it on the blank certificate using xlsread().
5. We need to give the information where the name, class Roll.No. ,school and rank to be printed on the certificate. For this we can obtain the position of the text to be inserted on the image using MS paint which gives you the data in pixels.
6. We provide parameters for function inserttext().
7. We adjust the Font size to match with the font size of text in sample image. We maintained the Font size as 50 .
8. In this code opacity of box is given as 0(Meaning 100% transparent).
9. We generate and save files with .tif extension.

Code:

```
clc % Clear command window.
close all % closes all the open figure windows

filename = 'student_details.xls';
[num,txt] = xlsread(filename);
% Read Excel sheet containing details. Text is read from the file
% seperately from numbers

len=length(txt);
% obtain length of text in excel or number of certificates to be generated
% This code provides scalability

blankimage = imread('sample_certificate.png');
% Read blank certificate image

for i=1:len
    for j= 2:2
        text_names(i,j)=txt(i,j);
    end
end
% Obtain names from the txt variable which are in 2nd column

for i=1:len
    for j= 3:3
        text_class(i,j)=txt(i,j);
    end
end
% Obtain topics from the txt variable which are in 3rd column
for i=1:len
    for j= 4:4
        text_roll(i,j)=txt(i,j);
    end
end
% Obtain roll no from the txt variable which are in 4th column

for i=1:len
    for j= 5:5
        text_school(i,j)=txt(i,j);
    end
end
% Obtain school names from the txt variable which are in 5th column

for i=1:len
    for j= 6:6
        text_rank(i,j)=txt(i,j);
    end
end
% Obtain ranks from the txt variable which are in 5th column
```

```

%Ignore first row which is heading
for i=2:len
    text_all=[text_names(i,2) text_class(i,3) text_roll(i,4)
text_school(i,5) text_rank(i,6)];
    % combine names and topics

    position = [710 695;515 852;922 850;1361 850;530 905];
    % obtain positions to insert on image, MSPaint or any image editor

    RGB =
insertText(blankimage,position,text_all,'FontSize',50,'BoxOpacity',0);
    %Provide parameters for function insertText
    %Font size is 50 and opacity of box is 0 means 100% transparent

    figure
    imshow(RGB)
    %Obtain and display figure in color

    y=i-1;
    filename=['Certificate_Topic_' num2str(y)];
    lastf=[filename '.tif'];
    saveas(gcf,lastf);
    % generate and save files with .tif extension
end

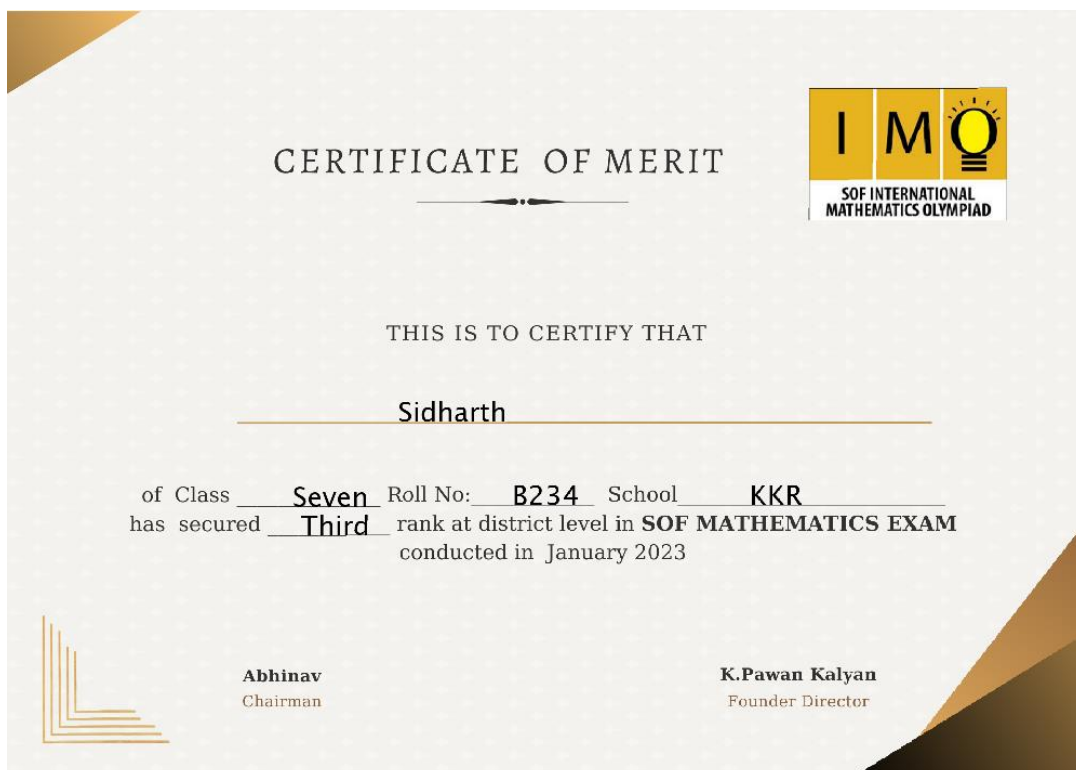
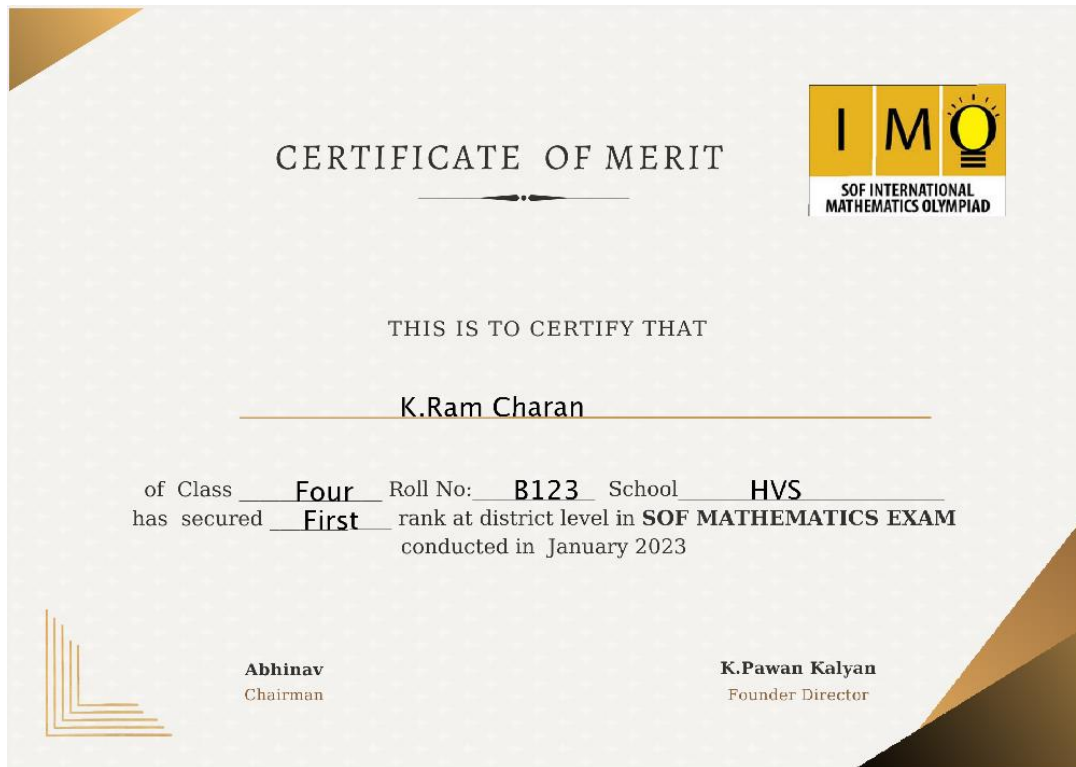
```

Output:

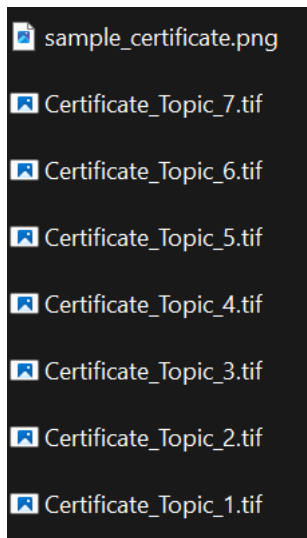
Workspace:

Workspace	
Name ^	Value
blankimage	1414x2000x3...
filename	'Certificate_To...
i	8
j	6
lastf	'Certificate_To...
len	8
num	[1;2;3;4;5;6;7]
position	[710,695;515,...
RGB	1414x2000x3...
text_all	1x5 cell
text_class	8x3 cell
text_names	8x2 cell
text_rank	8x6 cell
text_roll	8x4 cell
text_school	8x5 cell
txt	8x6 cell
y	7

Generated Certificates:



In total, this code generated 7 certificates for 7 different students. We attached 2 of the certificates above.



All the 7 certificates generated are stored in the same location where sample_certificate is stored.

Applications:

- Education and training: Certificate generation systems are frequently used in educational institutions and training programs to issue certificates to students or trainees who have completed a course or program.
- Professional certification: Professional certification bodies use certificate generation systems to issue certificates to individuals who have met the requirements for certification in a particular field.
- Compliance and regulatory requirements: Organizations in regulated industries, such as healthcare, finance, and engineering, use certificate generation systems to issue compliance certificates to demonstrate compliance with regulations or standards.

- **Corporate training:** Corporations use certificate generation systems to issue certificates to employees who have completed internal training programs or workshops.
- **Event management:** Certificate generation systems can be used to issue certificates to attendees or speakers at conferences, seminars, or other events.
- **Government services:** Government agencies use certificate generation systems to issue certificates for a variety of purposes, such as marriage certificates, birth certificates, and driver's licenses.

Advantages:

- **Time-saving:** Certificate generation can be a time-consuming task, especially if done manually. A certificate generation system automates the process, allowing for the quick and efficient creation of certificates.
- **Consistency:** A certificate generation system ensures that all certificates have a consistent design and layout, which can improve the professionalism and credibility of the organization.
- **Accuracy:** A certificate generation system reduces the risk of errors and typos in certificates, which can be costly to correct and may harm the reputation of the organization.
- **Scalability:** A certificate generation system can easily handle large volumes of certificates, making it suitable for organizations with many recipients.
- **Security:** A certificate generation system can include security features, such as watermarking or encryption, to prevent unauthorized duplication or modification of certificates.

Disadvantages:

- Complexity: Certificate generation systems can be complex, requiring a significant amount of time and effort to set up and maintain.
- Security risks: Certificate generation systems can be vulnerable to hacking or other security breaches, which could compromise the security of sensitive information.

Conclusion:

We have successfully developed certificate generation system using MATLAB.