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PROJECT TITLE: CERTIFICATE MAKER

1. **OBJECTIVE**: Build an automated, customized certificate generator for bulk candidates for events, exams, course completions or any other equivalent fields.

2. **CONTRIBUTORS**:

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3. **LANGUAGE USED:** PYTHON 3

4. **OVERVIEW**:

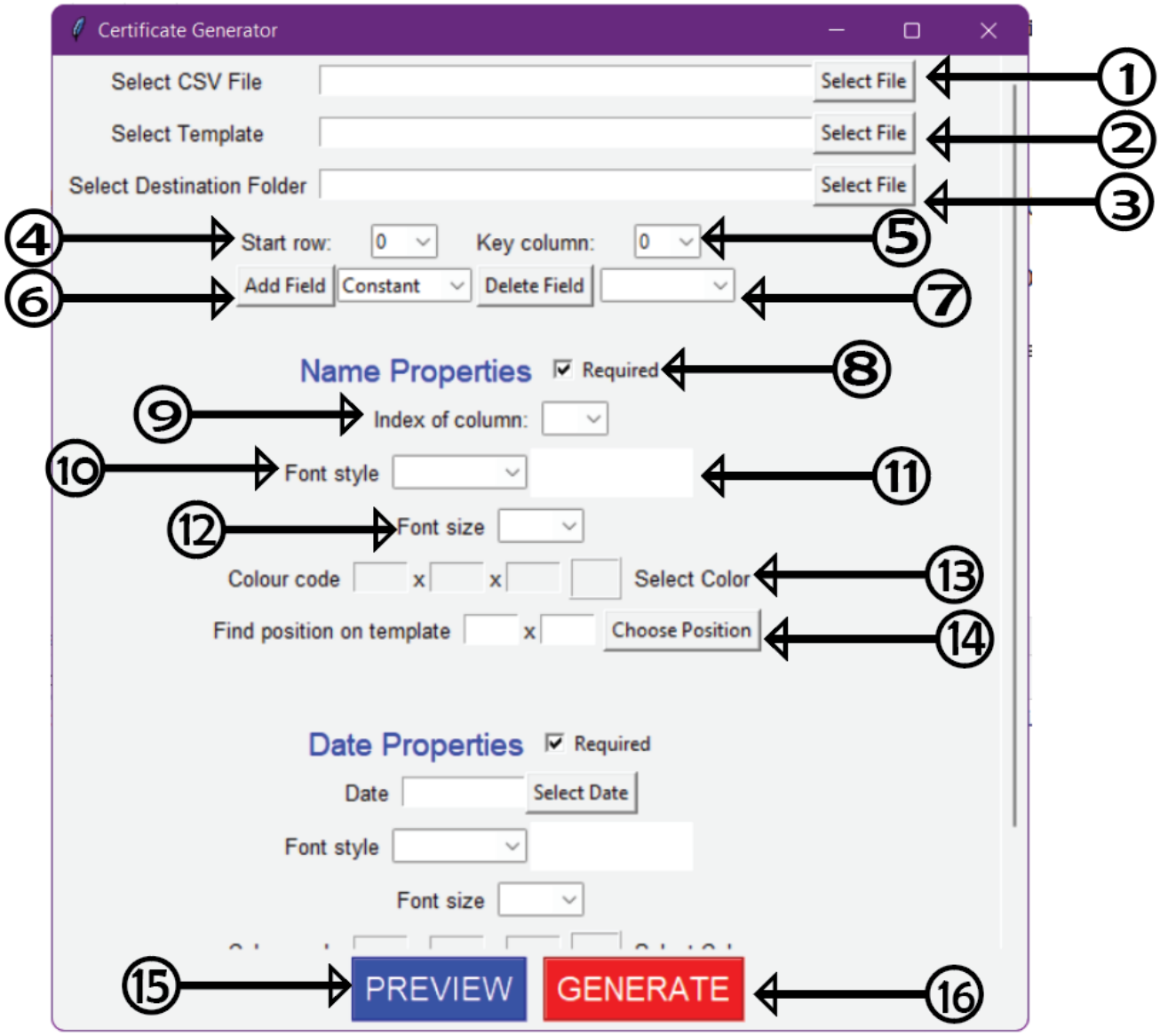
- This is an automated certificate framer or certificate generator to generate certificates for events, competitions, exams, course completions etc.

- Following files and folders are needed to use this program:

    a. A blank template image of certificate of adequate resolution in PNG,JPG/JPEG format.
    b. A CSV file containing records of the candidates.
    c. A folder where the certificates will get saved after creation.
    d. Optional small images if needed to be placed in certificate (Eg. small image of the sign or logo of the institution etc.)

Note: In case of images mentioned in point ‘d’. The dimension of the image must be the same as it will appear in the original template.

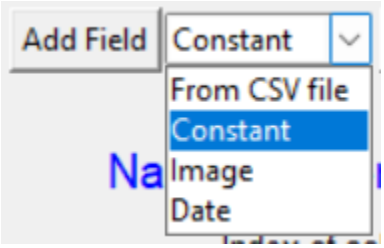
- **UI**:



Pointings:

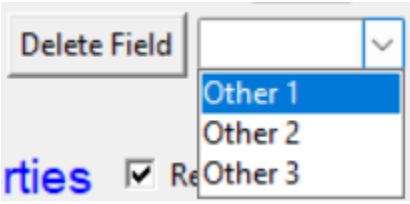
1. This field is to select the CSV file containing data of candidates. You can either type in the path or select the file using the dialogue box by clicking the button.
2. This field is to select the template for certificates.
3. This field is for selecting the destination folder.

4. This is the row number of the CSV file from which data is to be fetched.
5. This is the column to be used to save the certificates. The certificates will be saved with this column value for a particular row or tuple. It is preferable to use a key field as duplicacy will replace the previous file/files with the last one obtained.
6. This field is to add additional fields as per requirement other than name and date.



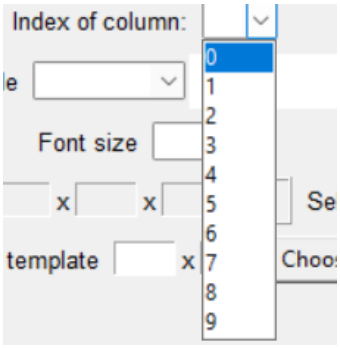
There are 4 options to choose from. The additional field may use a column from the csv file, it may be a text that is constant for all certificates, an image or a date to be placed on the certificate. You can add as many fields you want.

7. This field is used to delete the additional fields added. The dropdown list contains all the additional fields added. **The default name and date field are non-deletable.** However they can be disabled by using the check button as discussed in point 8.



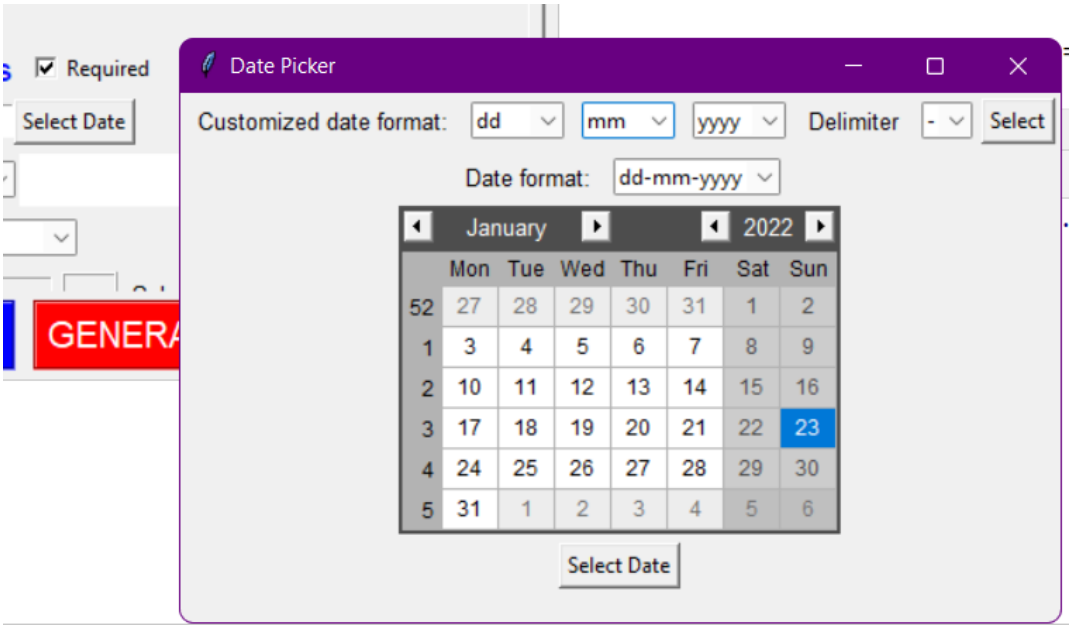
8. This checkbox is used to enable or disable the field. While unchecked, the field will be skipped while generating certificates.

9. This field is different for different types of fields.
    a. For fields using a column from the CSV file, it's a combobox to select the column number.

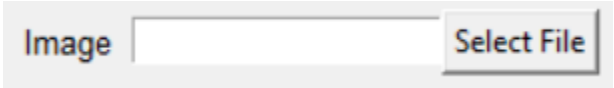


    b. For fields using constant text, it's an entry field.

    c. For fields using a date, it's an entry box with a button that opens a window with customizable date format and calendar to choose the date.



    d. For fields using a piece of image, it's an image file picker just like 2.

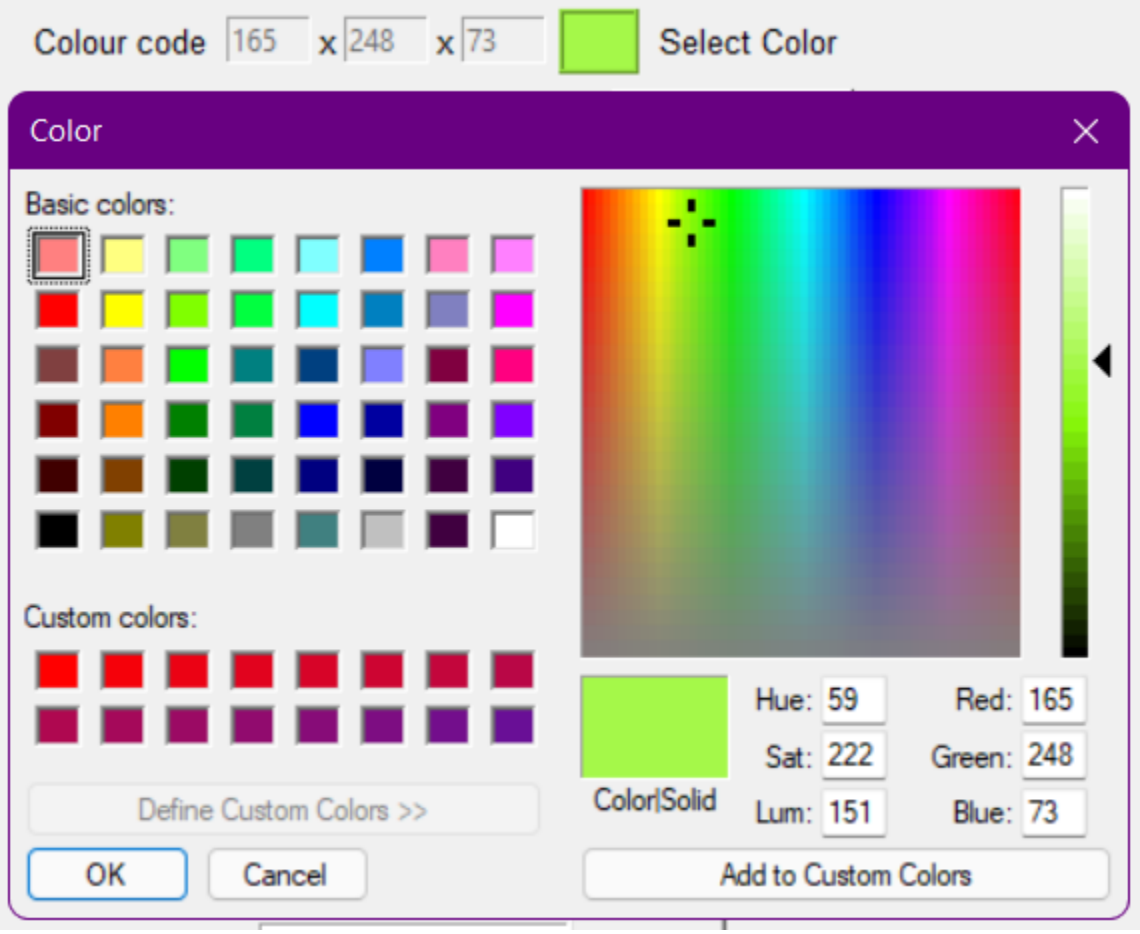


10. This list is to select font style from the Windows font folder (**C:\Windows\Fonts**) to be placed in the certificate field for that particular field.

11. This little white canvas shows a preview of the font selected in list 10.

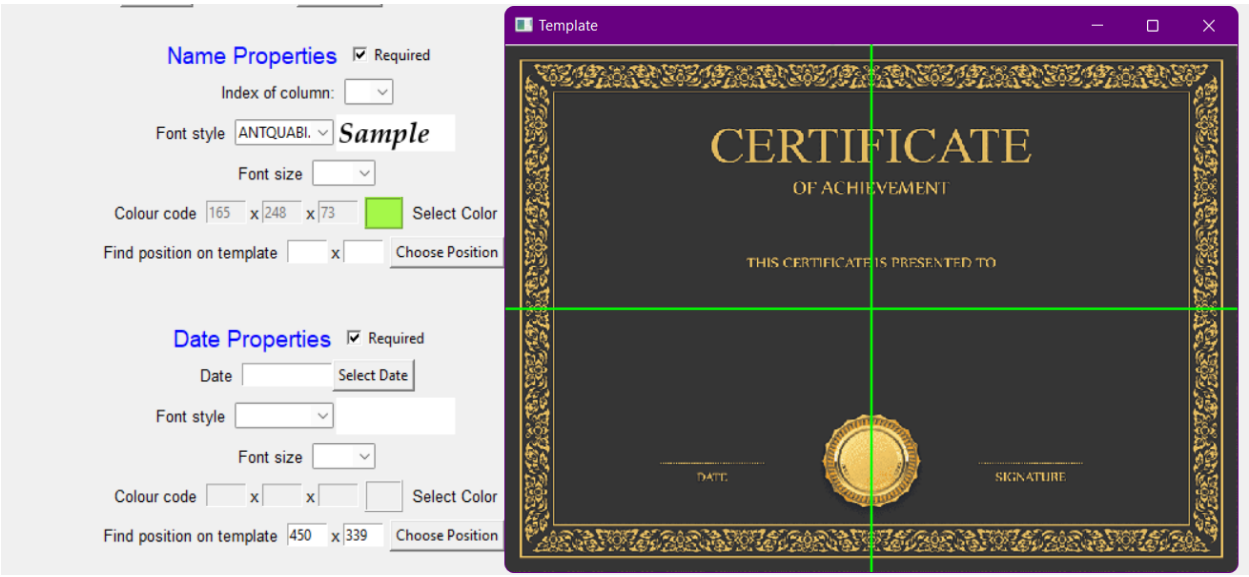
12. This list is to select the font size to be placed in the image.

13. This is the color selector for the font. The button provides a preview of the color as well as being used to select the color from a color gamut palette. It may seem to be invisible at first, but its present just at the left of the 'Select Color' label.



14. This button opens a preview of the template to select the position of the field in the image by clicking. You have to select the central

point position. You can also manually type in the position coordinates.



In case of a field with image as source, options from field 10 to 13 are not needed as they are related to text. So in the case of image fields only field no. 9 and 14 are provided.

15. This provides a preview of the certificate, with selected attributes and the first data containing row in the CSV file. Additional changes, alterations can be made before generating the certificates.
16. This is the final Button that shows and saves the certificates in the provided folder.

6. **CODE INSIGHT:**
   - PACKAGES USED

<>**Tkinter:** Tkinter is used here to make the main graphical UI. Several widgets as entries, comboboxes,buttons, labels etc are used. Also file selection and color chooser modules are used from this package.As it's an integrated package, we need not to install it separately.

<>**Tkinter.ttk:** We used two modules from this package. combobox, to provide a field with enryfield and dropdown list and

scrollbar to scroll the entire window. This is also an integrated package.

<>**OS:** This package is used to check the validity of a file and in case of missing external packages it will install them. This is an integrated package.

<>**OpenCV:** This package is used to open a preview window of the template image and get the coordinates of a point clicked on the preview window of template image. This is an external package.

<>**Tkcalendar:** This package contains the calendar widget, we used it for the date selection field. This is an external package and needs to be installed separately.

<>**PIL:** PIL stands for Python Imaging Library. This is the most important library used here. As most of the other packages are concerned with GUI and not the main operation of the code.This is the main package that contains all the modules required to open, process, save and show the output of image and other elements. We used ***ImageTk, Image, ImageDraw, ImageFont*** modules from this package. This is an external package and needs to be installed separately. **Remember the original name of this package for installation is 'pillow'.**

<>**CSV:** This is an integrated package in python 3 to handle CSV files. We have used it for the same.

- IMPORTANT CLASSES AND FUNCTIONS

Classes:

- ➔ **MainBox:** This class creates and configures the main window and puts elements in it. It also contains the methods to restrict the input fields and or verify data entered in some of the fields.

- ➔ **DirectField:** This is a subclass of the MainBox class. It creates a file or folder path insertion field with a button assigned to a function, that is to be passed as a parameter while creating an object from this class. It is used for getting the input of the main three files and folders.

- ➔ **DataField:** This is also a subclass of the class MainBox. This creates input fields for the certificate as per the source of field data(Eg. Constant string, image, column from CSV file, Date etc.). Data is fetched from the entry fields under this class. It also contains some methods for validation of entry fields, preview the font style selected in case of a text type data, showing and selecting color from colourbox etc.

- ➔ **FieldDataSet:**This class retrieves all the data entered in the main GUI and assigns them in a list.

- ➔ **FieldDataBlock:** This is a subclass of the class FieldDataSet that takes a DataField object as parameters and retrieves the inputted data from it.

Functions:

- ➔ **image_centering** and **text_centering:** The PIL modules use the corner position to place an object on an image. But It's more convenient to select the middle point while clicking on image preview. These functions take the object size(1st one for image and second one for text) and the middle point selected on template and returns the respective corner point components.

- ➔ **empty_check:** This function takes a list of DataField type objects and checks if it is disabled(or not required) and if not, if any the entry field is blank . It returns boolean value accordingly.

- ➔ **file_check** and **folder_check:** These functions check validity of a file or folder path. file_check function takes a list of file extensions and verifies that the file path meets the criteria.

➔ **certificate:** This function places all the objects on the certificate template, shows it and saves it in the destination file if required.

➔ **generate:** This is the main function that validates all the data inserted, opens the CSV file, creates an iterable list from the CSV file. Creates FieldDataSet object, passes the data in certificate as required. This function is binded to the ***'Preview'*** and ***'Generate'*** button.

NOTE:

★ **The preview of font requires an white or light coloured image of resolution 100x30 in PNG format, to be present in the root folder of the python file, named as 'preview.png'.**

★ **This program can only use fontfile of type .ttf[truetype] and .otf[opentype] installed at Windows font folder located at C:\Windows\Fonts.**

★ **Also in order to scroll down after adding one or more fields, the main window need to be maximized and minimized once.**

Reference used:

Codemy.com
Stack Overflow
GeeksForGeeks
TutorialsPoint
Python Docs
Scientific Computing in python(A. K Gupta)