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SUBJECT	INT 213:Python Programming QR codeGenerator+ [Readerusing Webcam]

INT 213: Python Programming

Qr code Generator + Reader using Webcam

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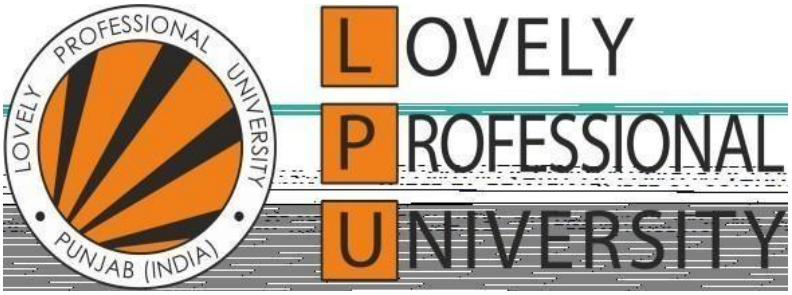
This is done during our 3rd semester for the award of the degree of ‘‘Integrated BTech.



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Punjab.

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Qr code Generator + Reader using Webcam

Abstract: -

Why Qr Code?

QR codes have become a ubiquitous mechanic for customers' brand engagement in Asia Pacific but as the pandemic speeds up digitisation elsewhere around the world, the use of QR codes is back on all marketers' agendas.

From restaurants and hospitality to government and safety information, QR codes have empowered anyone with a smartphone to easily access information and content. QR codes have also become a way for companies to tell brand stories, from packaging delivering provenance and sustainability stories, to luxury fashion telling designer, artists, and makers stories.

ACKNOWLEDGEMENT: -

I would like to thank my mentor - **Prof. Sagar Pande** for his advice and inputs on this project. Many thanks to my friends and seniors as well, who spent countless hours to listen and provide feedbacks.

Introduction

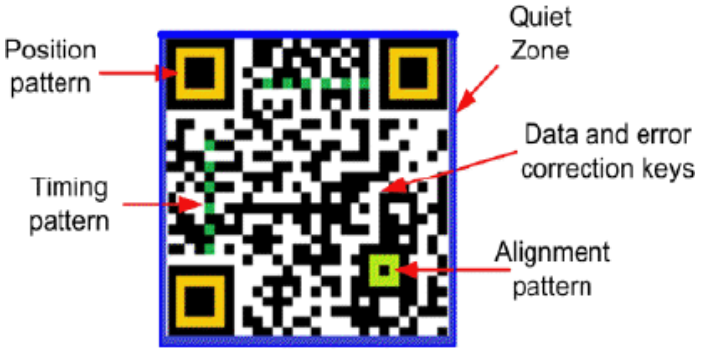
Context:

This project has been done as part of our course for the degree ‘‘Integrated BTech - MTech’’ at Lovely Professional University. Supervised by **DR.Sagar Pande**, we had two whole months to fulfil the requirements to succeed the module.

Qr Code

A QR code (an initialism for Quick Response code) is a type of matrix barcode (or two-dimensional barcode) invented in 1994 by the Japanese automotive company Denso Wave. A barcode is a machine- readable optical label that contains information about the item to which it is attached. In practice, QR codes often contain data for a locator, identifier, or tracker that points to a website or application.
A QR code uses four standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to store data efficiently; extensions may also be used.

How reading is done:



A QR code consists of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera and processed using Reed–Solomon error correction until the image can be appropriately interpreted. The required data is then extracted from patterns that are present in both horizontal and vertical components of the image.

Glimpse of Project

QR Code Generator project is an application which is developed in Python platform. This **Project** contains a grid of black squares on a white background, which can be read by any imaging device such as a camera and processed to extract the required data from the patterns that are present in the horizontal components of the image. This project aims to be the best, clearest library for generating QR Codes. My primary goals are flexible options and absolute correctness. Secondary goals are compact implementation size and good documentation comments.

Qr code Generator:

Package (s) Used:

- **Tkinter**

Tkinter is the standard GUI library for Python. Python when combined with Tkinter provides a fast and easy way to create

GUI applications. Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit.

- tkMessageBox

This module (tkinter Gadget) is used to display message boxes in your applications.

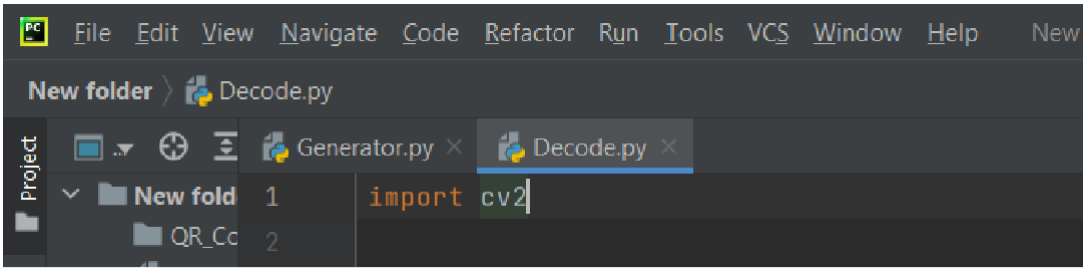
- **OS Module**

  The OS module in Python provides functions for interacting with the operating system. OS comes under Python's standard utility modules. This module provides a portable way of using operating system-dependent functionality.

- **PyQRCode Module**

This module is used to create QR Codes. It is designed to be as simple and as possible. It does this by using sane defaults and autodetection to make creating a QR Code very simple. It is recommended that you use the pyqrcode.create() function to build the QRCode object. This results in cleaner looking code.

Qr Code Decoder using Webcam



Open CV

OpenCV is a huge open-source library for computer vision, machine learning, and image processing. OpenCV-Python is a library of Python bindings designed to solve computer vision problems.cv2.imread() method loads an image from the specified file. If the image cannot be read (because of missing file, improper permissions, unsupported or invalid format) then this method returns an empty matrix.

Later, OpenCV came with both cv and cv2. Now, there in the latest releases, there is only the cv2 module, and cv is a subclass inside cv2. You need to
call import cv2.cv as cv to access it.

Basic Building Blocks of the codes:

- Qr code Generator

The Qr generator here created not only can generate the qr code but also save the Qr code image in **png format** in the same folder where the project exists under the folder created by the program itself **Qr-Codes.**

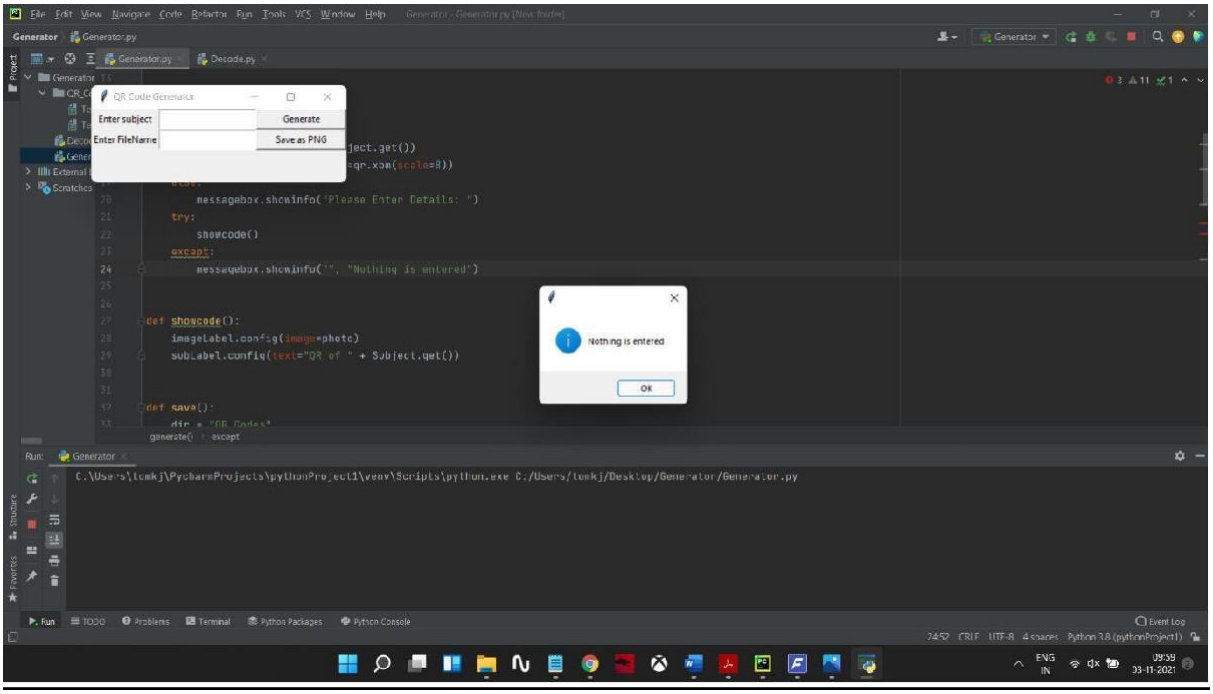
Glimpse of code:

- Package Importing + Qr code generation

The above-mentioned code(screenshot) is a glimpse of Package Importing + Qr code generation. With the help of library pyqrcode the code is generated if the length of characters is zero the code will self-exit, else the code will execute the library to move forward and generate the corresponding qr code.

Result:

Fail Condition:

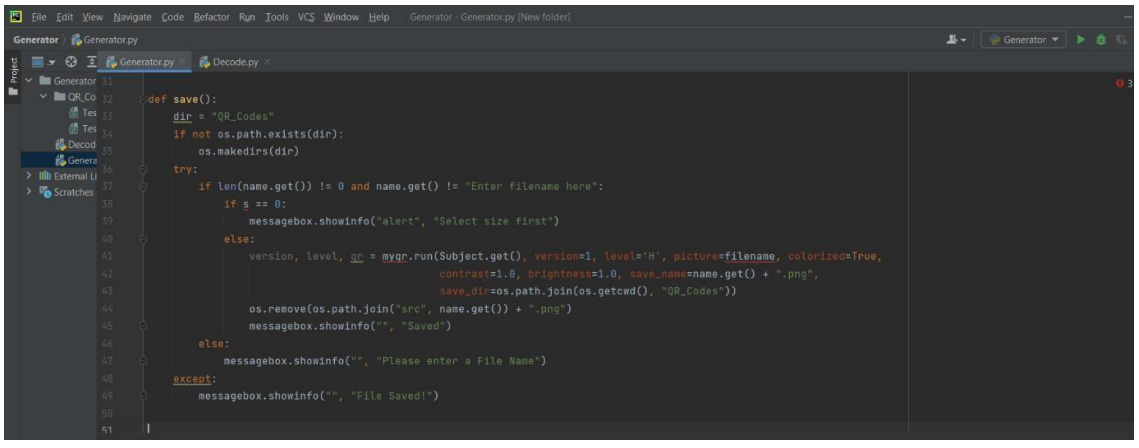


Occurs when:

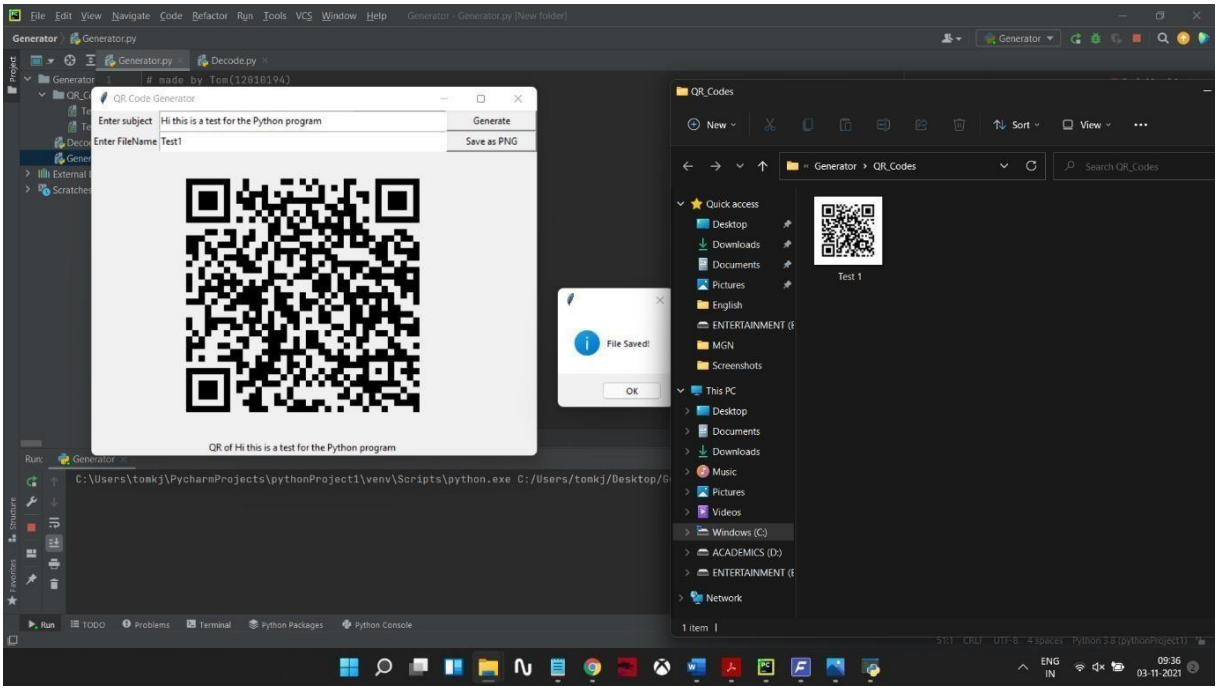
- No data is given to input.

Saving the qr code created using the generator.

Mode of Operation: If Qr code is generated with a filename using the above code this loop will take place otherwise it will be skipped.



If details are entered in the columns and want to save the above file just click save as png it will execute. And the png file will be saved in the folder QR_Codes.



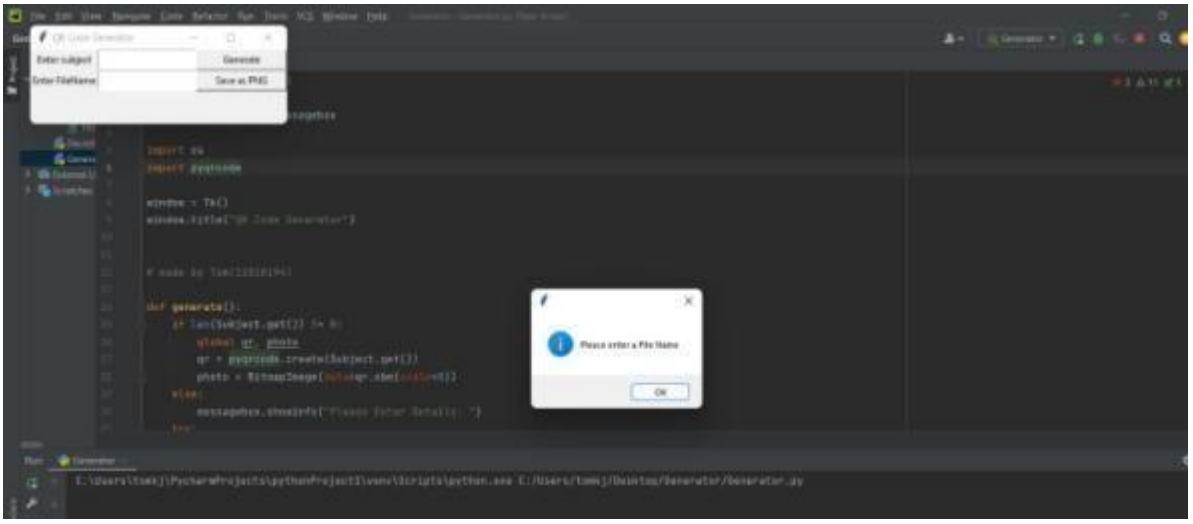
Fail

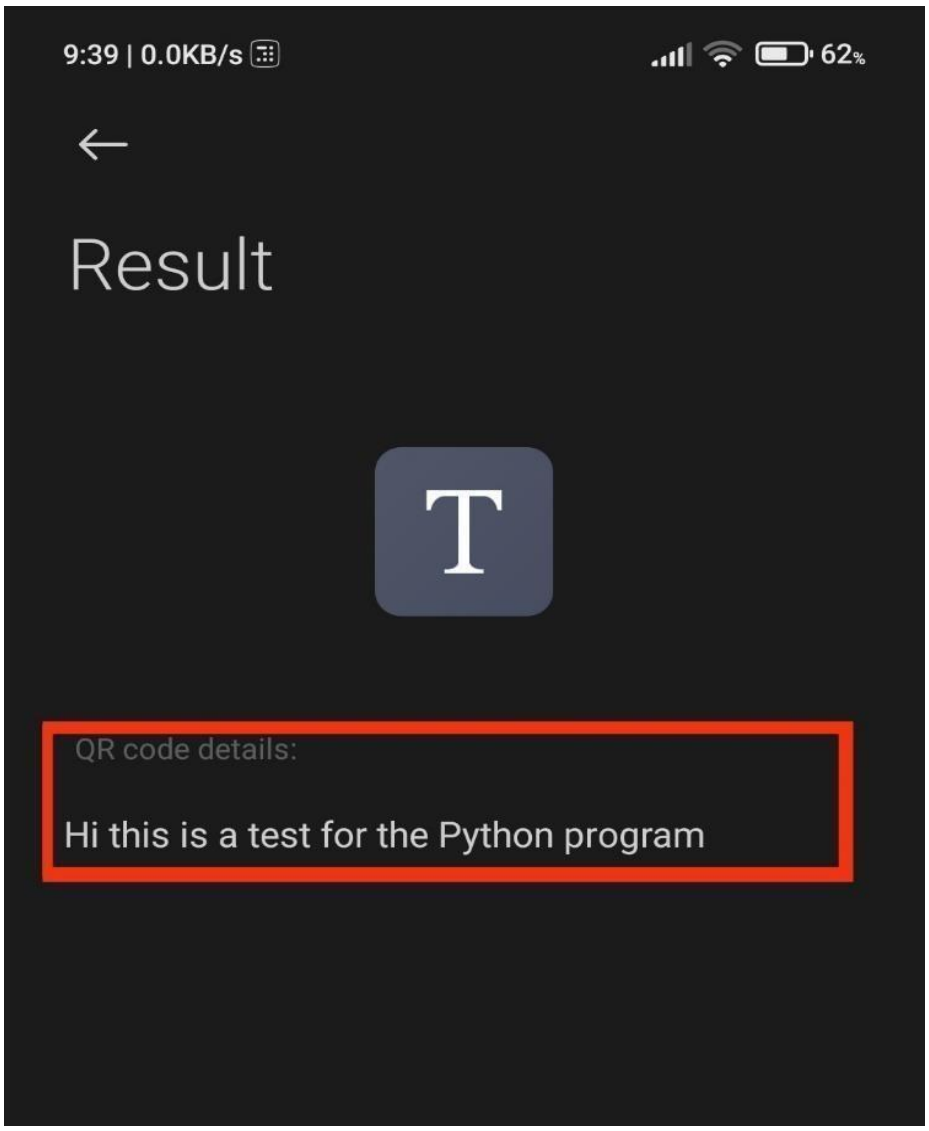
Condition

Occurs

when:

1. File name is not Entered.
2. No Qr code is generated.
3. If (1), (2) is true.





Result of Generated Qr code (Scanned using Smart Phone)

Entered test: Hi this is a test for the python program.

Generated Qr code:

Finalised

- Qr code Decoder (Using Webcam)

The Qr code decoder thus created is to demonstrate that our program is capable of not only to generate the Qr code but also to decode using the webcam.

Glimpse of code

- **Importing & Initializing**

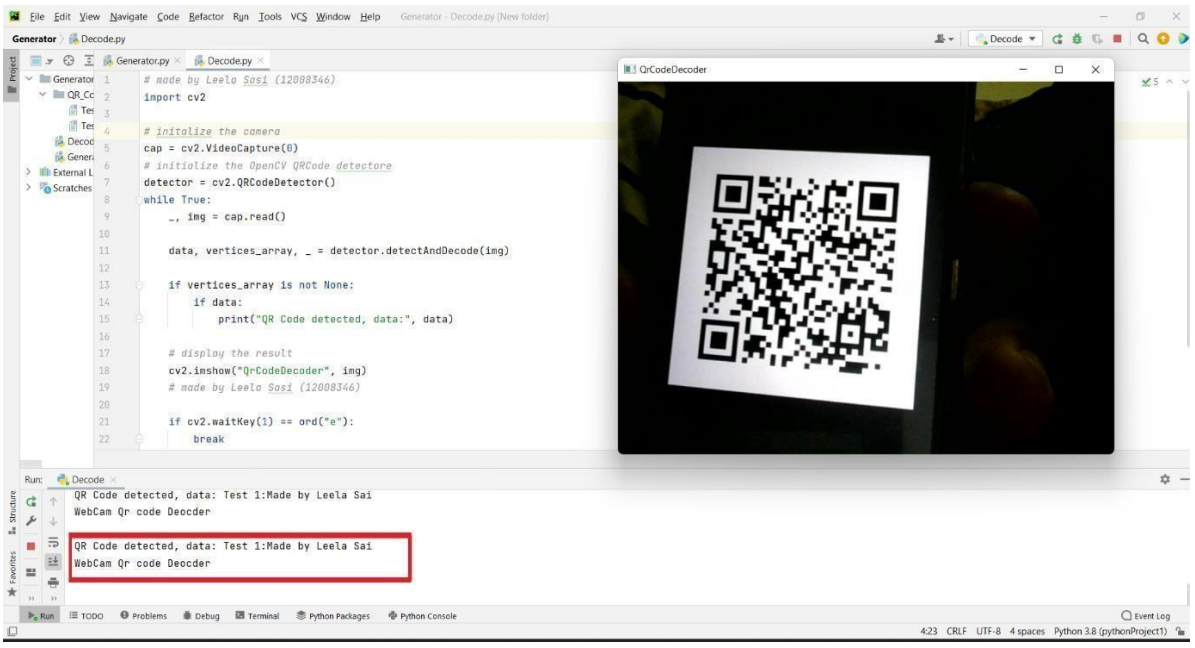
  During this phase of code, the importing of OpenCV library is done and it is used for the visual communication through the webcam also it initialises the inbuilt Qr code detector from the OpenCv.

  ie.,

  cv2.QRCodeDetecto

  r()

- **During Runtime**
- During the runtime of the program the code enables the webcam to detect any Qr code and decodes it into the process window.



Exit

The code will not self-exit but if we press the desired key (to my code it is alphabet '**e**'). This enables our code not only to detect one code at a time but numerous ones.

Conclusion

From this project we understood that there is strength in unity and working us a team made us realise this. The project thus conducted is not only to prove that we have the calibre to work as a beginner python coders but also to prove that the Qr code have a long promising future.

QR (Quick Response) Codes can be read and understood by mobile devices. Marketers have used this in billboards, magazines, web pages, and any other marketing material. QR codes can provide more information about the product or service without a sweat, and the information quickly goes to the user's device. Basically, QR codes promote interaction and engagement through the mobile phone.
This type of marketing strategy enables businesses to transfer information to the user. Nowadays, users are done with anything that's slow and time-consuming. It's all about being instant and fast, especially in the world of marketing.The application of Qr code cannot be limited to one use but the application is so many…,

For QR codes to continue to be successful, however, it is incumbent on marketers to create a great experience and give their target audience guidelines on the proper usage. Easy-to-understand directions can go a long way to increase the number of participants in the campaign and conversions. And it is equally important that if you are going to move your customers to download the QR code app, scan your code, and deliver them to a URL, then the to be worth

their time. Delivering true value will be rewarded with increased web traffic and conversions.

Some Applications:

1. Direct customers to a landing page/website
2. Dial your business number
3. Send a message
4. Send an email
5. Download apps
6. View business location
7. Direct customers to social media pages
8. Shopping and E-commerce.

References

To conduct this project the following tools have been used:

- PyCharm: For Compiling + Library Management + Executing code.

- Stack Overflow: For Doubt clearing.

- Udemy & Coursera: For Python Learning.