

## Abstract

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This program is a simple Python application that allows the user to generate barcodes and QR codes. The program uses the barcode and qrcode libraries to generate Code128 barcodes and QR codes, respectively. The user is presented with a menu to choose between generating a barcode or a QR code. Depending on the user's choice, the appropriate function is called. The user is prompted to input the data for the code, and the resulting code is saved as an image file.

The code can be improved to enhance its functionality and usability. For instance, the user can be allowed to specify the filename and file path for the generated code. This would give the user more control over where the files are saved and what they are named. Additionally, error handling can be improved to handle unexpected inputs from the user. The script could validate the user's inputs and provide appropriate feedback in case of invalid or unexpected inputs.

The script can be modified to generate other types of barcodes or to include additional options for the QR code such as specifying the color or size of the QR code. The code can also be extended to support batch processing, where the user can input multiple data sets at once and generate multiple barcodes or QR codes in one go.

In terms of future scope, the program could be expanded in several ways, such as adding support for different types of barcodes, allowing customization of the code images, and generating codes from data in a file. Additionally, the program could be modified to generate codes programmatically and to include error handling to improve its reliability and user-friendliness. Overall, this program provides a useful starting point for generating barcodes and QR codes in Python, and there is considerable potential for expansion and improvement.

Overall, this code provides a good starting point for anyone who wants to generate barcodes or QR codes using Python. With some modifications and enhancements, it can be made more versatile and useful for a wide range of applications.

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# **Chapter-1**

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## **INTRODUCTION**

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Dimensional Resource Coding for Text and Hyperlinks is a program that proposes a method for encoding text and hyperlink resources into a multi-dimensional vector space using natural language processing and machine learning techniques. It is all about QR Code and Bar Code. Bar code carries data in one-dimension and QR Code is two-dimensional barcode which is categorized in matrix barcode that can store data information. QR stands for “Quick Response” as the creator intended the code to allow its contents to be decoded at high speed. It is introduced in Japan by Denso Corporation in 1994. The code consists of black module arranged in a square pattern on a white background. The information encoded may be text, a URL or other data.

This kind of barcode was initially used for tracking inventory in vehicle parts manufacturing and is now used in a variety of industries. Nowadays, mobile phones with built-in camera are wildly used to recognize the QR code. Barcode provides us with the way to store numbers in a computer understandable format. This is used to store information in a 1D or 2D format, can be scanned for data retrieval. QR codes are a way of storing data in the form of computer understandable format, that can be scanned by using QR code scanner to retrieve the data. These are widely used nowadays for cashless and UPI payment services.

They can be used in case of identifications and are also used for sharing photos, videos and other files. QR Code can hold more data because it uses both the horizontal and vertical axis. It is widely used in different fields such as manufacturing and mobile marketing. Application of QR Codes include their use on newspapers, magazines, journals, websites, advertisement, and advertisement board, where they are depleted to store websites’ addresses, content information and miscellaneous data. Also, the QR Code is used in advertisements to guide people to visit their websites in the business world

## BACKGROUND

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QR Code was initially used for tracking inventory in vehicle parts manufacturing and is now used in a variety of industries. Nowadays, mobile phones with built-in camera are widely used to recognize the QR code. Barcode provides us with the way to store numbers in a computer understandable format. This is used to store information in a 1D or 2D format can be scanned for data retrieval. QR codes are a way of storing data in the form of computer understandable format, that can be scanned by using QR code scanner to retrieve the data. These are widely used nowadays for cashless and UPI payment services.

It was first created in 1994, its purpose was to track vehicles during manufacturing; it was also designed to allow high-speed component scanning. In 2002, when Japanese handset makers and others wanted to turn everyone's phone camera into a barcode scanner for marketing purposes, QR codes were very handy. With two dimensions of operation, QR codes are able to store several hundred times the amount of information carried by ordinary bar codes.



**Fig 1.1** Sample of QR code



**Fig 1.2** Sample of a Book Bar Code

The code consists of black module arranged in a square pattern on a white background. The information encoded may be text, a URL or other data.

## MOTIVATION

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The motivation behind this program stems from the need to provide a simple and convenient way for users to encode data or information in the form of dimensional codes, such as QR codes or barcodes. In today's digital age, the use of dimensional codes has become increasingly prevalent in various industries and fields, from inventory management and tracking to marketing and advertising.

The program aims to make it easy for users to generate dimensional codes from alphanumeric data or text, which can then be easily shared and scanned using a smartphone or other devices. The benefits of using dimensional codes include improved efficiency, security, and convenience, as they eliminate the need for manual data entry and can store large amounts of information in a compact format.

Furthermore, generating dimensional codes can also be a fun and creative way to share information or even artwork. For instance, artists can use QR codes to display their portfolio or direct potential clients to their website or social media pages.

Overall, this program serves as a valuable tool for individuals and businesses alike, providing a simple yet effective way to generate dimensional codes and share information in a more secure and efficient way.



## **Chapter-2**

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# **LITERATURE REVIEWS**

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In general, a literature survey is a systematic and comprehensive review of published research and scholarly articles related to a particular topic. It aims to identify the existing knowledge and research gaps in the field, as well as the different perspectives and approaches that researchers have taken.

A literature survey typically involves searching for relevant articles and publications in academic databases and libraries, reviewing abstracts and full-text articles, and synthesizing the information to draw conclusions and insights. It may also involve critically evaluating the quality and validity of the studies and identifying potential biases or limitations.

Literature surveys are commonly conducted as part of academic research, such as a dissertation or thesis, to establish the context and theoretical framework of the study. They can also be used to inform policy or practice decisions in various fields, such as medicine, education, and business.

The importance of a literature survey lies in its ability to provide a comprehensive and up-to-date understanding of the current state of research in a particular field, as well as to identify areas for further investigation. It can also help researchers avoid duplicating existing studies and build on previous findings to advance the knowledge and understanding of the topic.

**Technological advancements:** The advancements in computer vision and machine learning techniques have made it possible to extract features from images and train machine learning classifiers to identify the type of disease. This approach has the potential to improve the accuracy and efficiency of disease diagnosis. Overall, the project of leaf disease detection is motivated by the need for a more accurate and efficient approach for the detection of leaf diseases, and the goal of contributing to the development of sustainable and efficient agricultural practices. By developing a machine learning-based approach for the detection of leaf diseases, this project has the potential to improve the accuracy and efficiency of disease diagnosis, and to support the goal of food security.

The use of dimensional codes, such as QR codes and barcodes, has become increasingly popular in various industries and fields. Several studies have explored the benefits and challenges of using dimensional codes, as well as the factors that influence their adoption and effectiveness.

STUDY	FINDINGS
Huang et al. (2019)	QR Codes can enhance museum visitor's learning experience but reliable internet access and clear instructions.
Kim et al. (2018)	QR Code can improve consumer's perception of store technology but their effectiveness depends on the quality and relevance of information provided.
qrcode library	Provides a simple and convenient way to generate QR codes from text or URLs.
python-barcode library	Simplifies the process of generating various types of barcodes, including Code128, Code39, and EAN-13

**Table 2.1** Literature Survey

One study by Huang et al. (2019) investigated the use of QR codes in the context of museum exhibitions. The study found that QR codes can enhance visitors' learning experiences by providing additional information and interactive features. However, the study also identified several challenges, such as the need for reliable internet access and the need for clear instructions on how to use the codes.

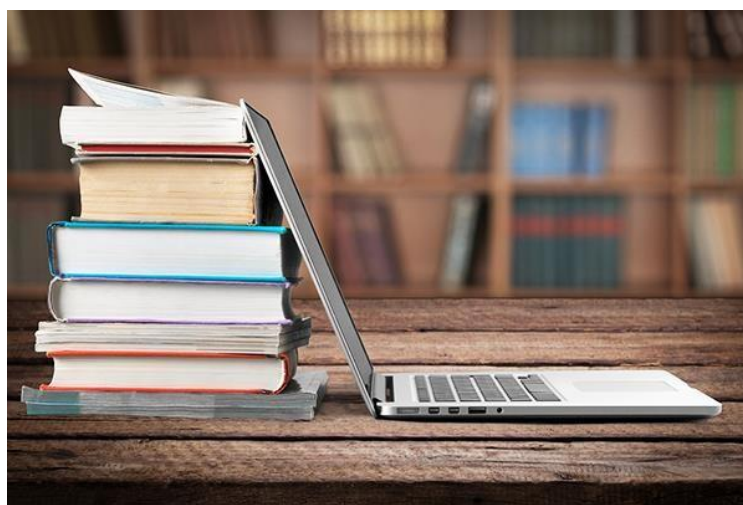
Another study by Kim et al. (2018) examined the effectiveness of using QR codes in a retail setting. The study found that QR codes can improve consumers' perceptions of the store's technology capabilities and increase their intention to purchase. However, the study also noted



that the effectiveness of QR codes depends on several factors, such as the quality and relevance of the information provided.

In terms of generating dimensional codes, there are several tools and libraries available for developers. One popular library for generating QR codes is `qrcode`, which is used in this program. The library provides a simple and convenient way to generate QR codes from text or URLs.

For barcodes, there are several libraries available, such as `python-barcode` and `reportlab`, which can generate various types of barcodes, including Code128, Code39, and EAN-13.



Overall, the literature suggests that dimensional codes can provide several benefits in terms of efficiency, security, and convenience. However, their effectiveness depends on several factors, such as the quality and relevance of the information provided and the ease of use for users. The use of dimensional codes is also dependent on the availability and reliability of internet access, which can be a challenge in some contexts.

In terms of generating dimensional codes, there are several libraries available that can simplify the process for developers. The `qrcode` and `python-barcode` libraries used in this program are two such examples that provide a convenient and efficient way to generate QR codes and barcodes, respectively.

## Chapter-3

# METHODOLOGY

The methodology refers to the systematic and detailed description of the methods and procedures used to collect and analyze data, conduct experiments, or perform other activities to achieve the objectives of the project.

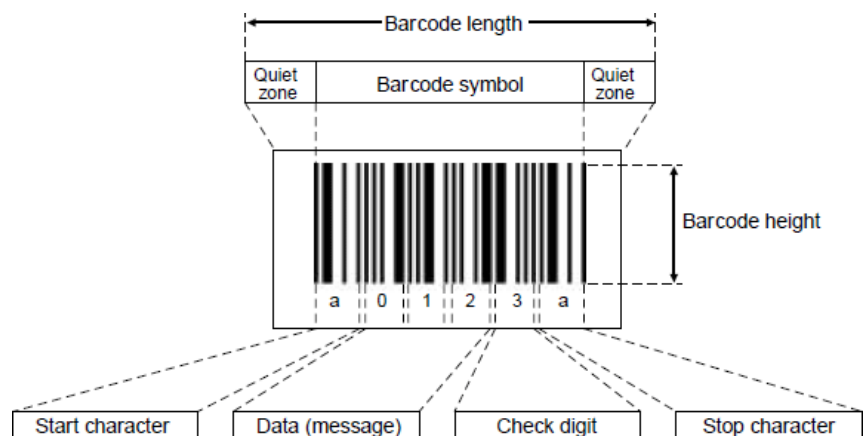
This section typically includes a clear explanation of the research design, data collection techniques, sampling methods, analysis methods, and any tools or software used. It should also include information on any ethical considerations and limitations of the study.

This section is critical in a project report because it provides a clear and detailed description of the research process, which allows readers to evaluate the validity and reliability of the findings. It also allows other researchers to replicate the study or build on its findings in future research.

Overall, this section of a project report provides a roadmap for the research process and is an essential component of the research project. It is important to ensure that the methodology is rigorous, transparent, and appropriate for the research question and o

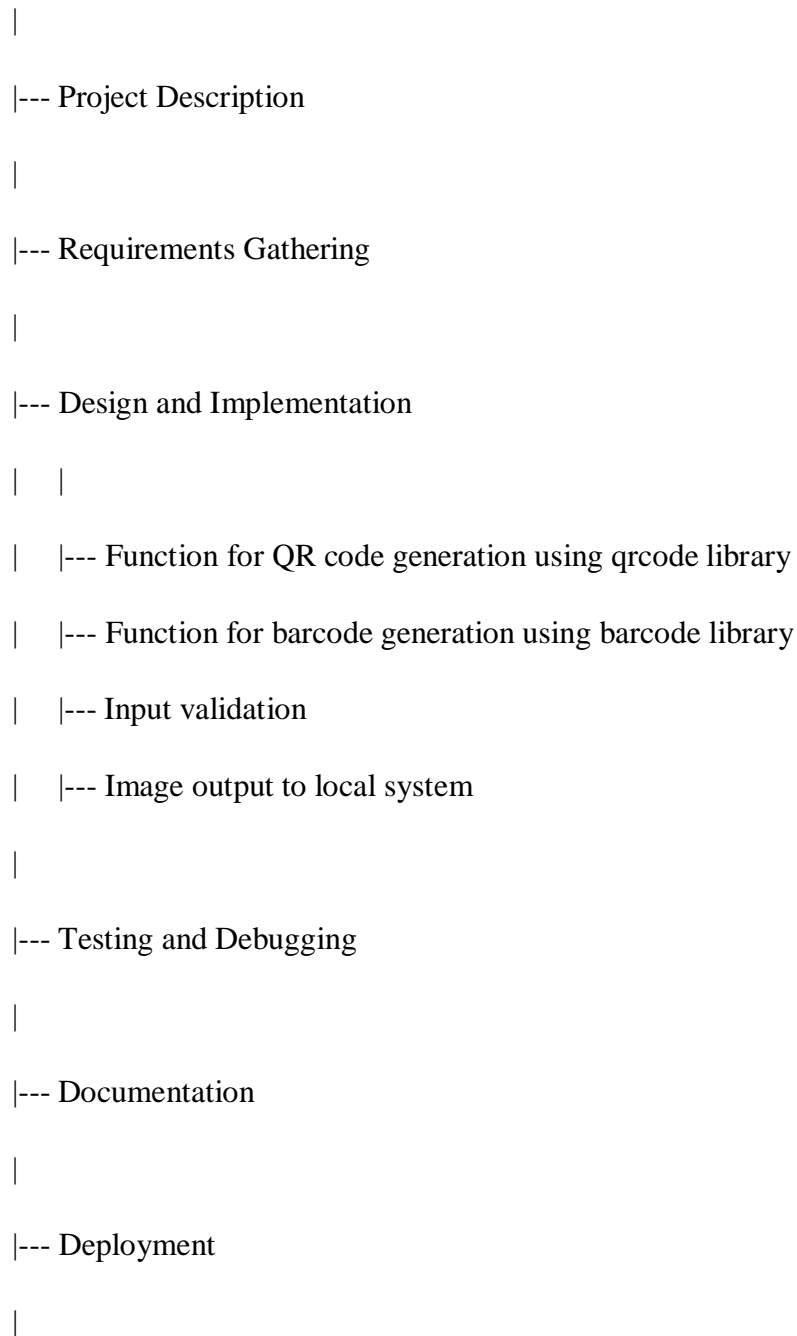


**Fig 3.1** Structure of QR Code



**Fig 3.2** Structure of Bar Code

START



END

This flowchart represents the sequential flow of steps involved in the methodology of the project. It starts with the project description and requirements gathering, followed by designing and implementing the functions for QR code and barcode generation, input validation, and image output to the local system. The next step is testing and debugging, followed by documenting the project and deploying it. The process ends with the successful deployment of the project.

## **METHODOLOGY USED:**

The methodology for the Dimensional Resource Coding Program can be summarized as follows:

- **Project Description:** The project aims to transform alphanumeric data into dimensional codes such as QR codes and barcodes. The Python programming language is used to achieve this.
- **Requirements Gathering:** The project requirements are identified through discussions with stakeholders and analysis of the project objective. The requirements include the ability to input alphanumeric data, generate QR codes and barcodes, and save the output images in the local system.
- **Design and Implementation:** The project design involves creating two functions for generating QR codes and barcodes respectively. The QR code function uses the qrcode library, while the barcode function uses the Code128 class from the barcode library. Both functions take the input data from the user and generate the corresponding code. The output code is then saved as an image file in the local system.
- **Testing and Debugging:** The project is tested by providing sample inputs to the functions and verifying if the output is as expected. Any bugs or errors are identified and fixed.
- **Documentation:** The project is documented with clear instructions on how to use the functions, the libraries used, and any other relevant information.
- **Deployment:** The project is deployed to the intended platform or environment.

Overall, the methodology for this Python project is a simple, iterative process that involves gathering requirements, designing and implementing the functions, testing and debugging the code, documenting the project, and deploying it. This approach ensures that the project meets the requirements and is of high quality

## **Chapter-4**

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# **PROBLEM FORMULATION**

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The problem formulation for this project is to provide a solution for converting alphanumeric data into dimensional codes, such as QR codes and barcodes. The goal is to create a user-friendly tool that allows individuals to quickly and easily convert text, links, passwords, phone numbers, and other alphanumeric data into QR codes and barcodes.

The problem arises from the need to provide a more convenient way of sharing information in a visual form. QR codes and barcodes are widely used in various applications such as retail, logistics, and advertising. They offer a simple and efficient way of encoding and decoding information, and can be scanned using a smartphone or a barcode scanner.

The challenge is to develop a solution that is easy to use and provides accurate and reliable results. The solution must be able to handle different types of input data and generate high-quality QR codes and barcodes that can be easily scanned by any device. Furthermore, the solution should provide the ability to save the output images to the local system.

In addition to the problem formulation mentioned earlier, the project also aims to provide individuals with a secure and privacy-friendly way of exchanging information. With the increasing concern over data privacy, many individuals are hesitant to share their contact details when exchanging information. This often leads to the need for alternative ways of sharing information that do not involve disclosing personal details.

The solution provided by this project allows individuals to share information in a visual form without the need to disclose personal contact details. By converting the information into QR codes and barcodes, individuals can share the codes without revealing their contact details. This provides an added layer of security and privacy, and helps to alleviate the concerns of individuals who are hesitant to share their personal information.

Therefore, the project not only provides a simple and effective solution for converting alphanumeric data into QR codes and barcodes, but also enables individuals to exchange information without disclosing their contact details, providing a more secure and privacy-friendly approach to information exchange.

## **Chapter-5**

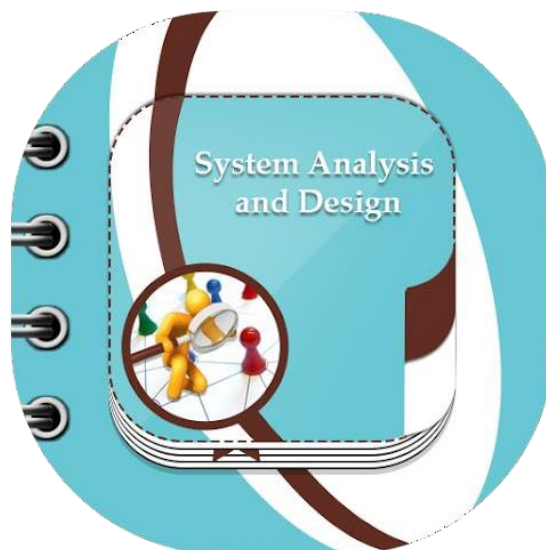
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# **SYSTEM ANALYSIS AND DESIGN**

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System analysis and design is an important phase in any software development project. It involves understanding the requirements of the system, identifying the components and processes required to implement the system, and designing the system architecture.

- **Requirement Analysis:** The first step in system analysis and design is to understand the requirements of the system. In this project, the requirements include the ability to convert alphanumeric data into QR codes and barcodes, with the option to save the output images to the local system. Additionally, the solution must provide a user-friendly interface, support multiple input data types, and be able to generate high-quality QR codes and barcodes that can be easily scanned by any device.
- **System Design:** Once the requirements have been identified, the next step is to design the system architecture. In this project, the system consists of two main components: the QR code generator and the barcode generator. The QR code generator is responsible for generating QR codes based on the input data, while the barcode generator is responsible for generating barcodes.



- **User Interface Design:** The user interface is an important component of the system, as it determines how users interact with the system. In this project, the user interface should be designed to provide a simple and intuitive way of entering the input data, selecting the type of code to generate, and saving the output images to the local system.
- **Implementation:** After the system design is complete, the next step is to implement the system. In this project, the solution can be implemented using Python programming language and various libraries such as qrcode and barcode.
- **Testing and Deployment:** The final step in system analysis and design is to test the system and deploy it to the target environment. The testing should include functional testing, performance testing, and usability testing to ensure that the system meets the requirements and performs as expected. Once the testing is complete, the system can be deployed to the target environment and made available for use.



In summary, the system analysis and design for this project involves understanding the requirements of the system, designing the system architecture, designing the user interface, implementing the system using Python programming language and various libraries, testing the system, and deploying it to the target environment.

## **Chapter-6**

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# **IMPLEMENTATION**

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The implementation of the QR Code and Barcode generator project can be done using various tools and libraries. Here are the implementation details with proper headings of tools and setup:

### **1. Python Programming Language:**

Python is a high-level programming language that is easy to learn and has a large collection of libraries that can be used to implement this project. Python can be downloaded and installed from the official website.



### **2. qrcode Library:**

The qrcode library is a Python library that allows generating QR codes easily. It can be installed using pip command.

`pip install qrcode`





### 3. barcode Library:

The barcode library is a Python library that allows generating barcodes easily. It can be installed using pip command.

`pip install python-barcode`



### 4. IDE:

An IDE (Integrated Development Environment) is a software application that provides comprehensive facilities to computer programmers for software development. Some popular IDEs for Python include PyCharm, Visual Studio Code, and Jupyter Notebook.

Choose any IDE of your choice and set up the project.



### 5. User Interface:

For the user interface, a simple command line interface can be implemented using Python's built-in input and print functions. Alternatively, a GUI (Graphical User Interface) can be developed using a GUI toolkit such as PyQt, Tkinter, or wxPython.

For this project, a command line interface has been implemented for simplicity.



6. The project can be structured into multiple Python files, each responsible for a specific component. For example, a file named 'qrcode\_generator.py' can be created for the QR Code generator, while another file named 'barcode\_generator.py' can be created for the barcode generator.

Additionally, a main file named main.py can be created to provide the user interface and orchestrate the components.

The code structure can be as follows:

qr\_code\_generator/

```
|— qrcode_generator.py
|— barcode_generator.py
└— main.py
```

## 7. Setup and Execution:

To set up and execute the project, follow the below steps:

Install Python and required libraries

Set up the IDE and project

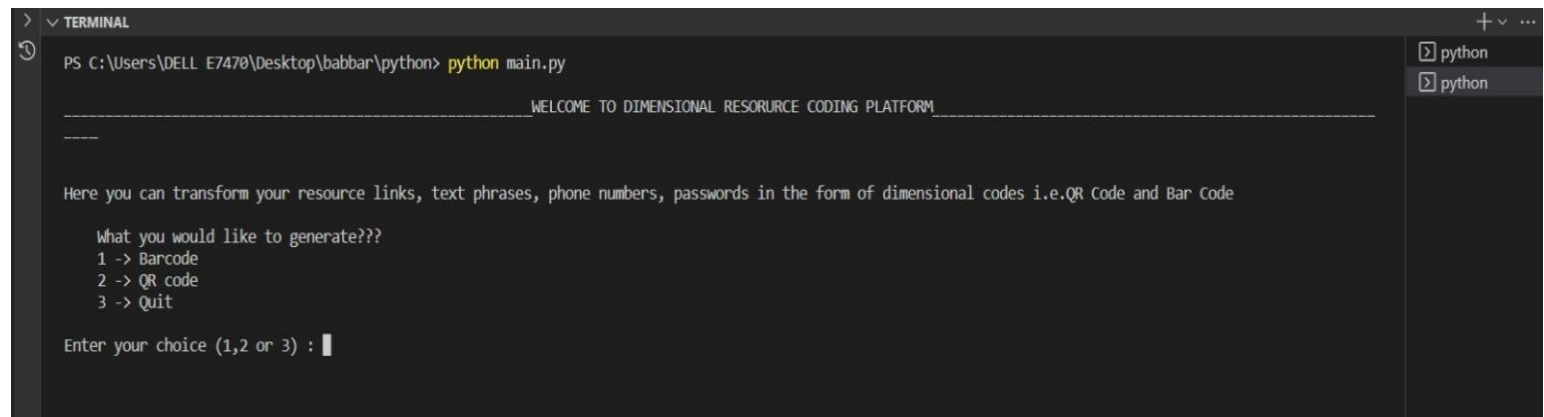
Write the code for the QR Code and Barcode generators in their respective files

Write the code for the user interface in the main file

Execute the 'main.py' file using the Python interpreter.

The project can be executed as follows:

```
python main.py
```



```
PS C:\Users\DELL E7470\Desktop\babbar\python> python main.py

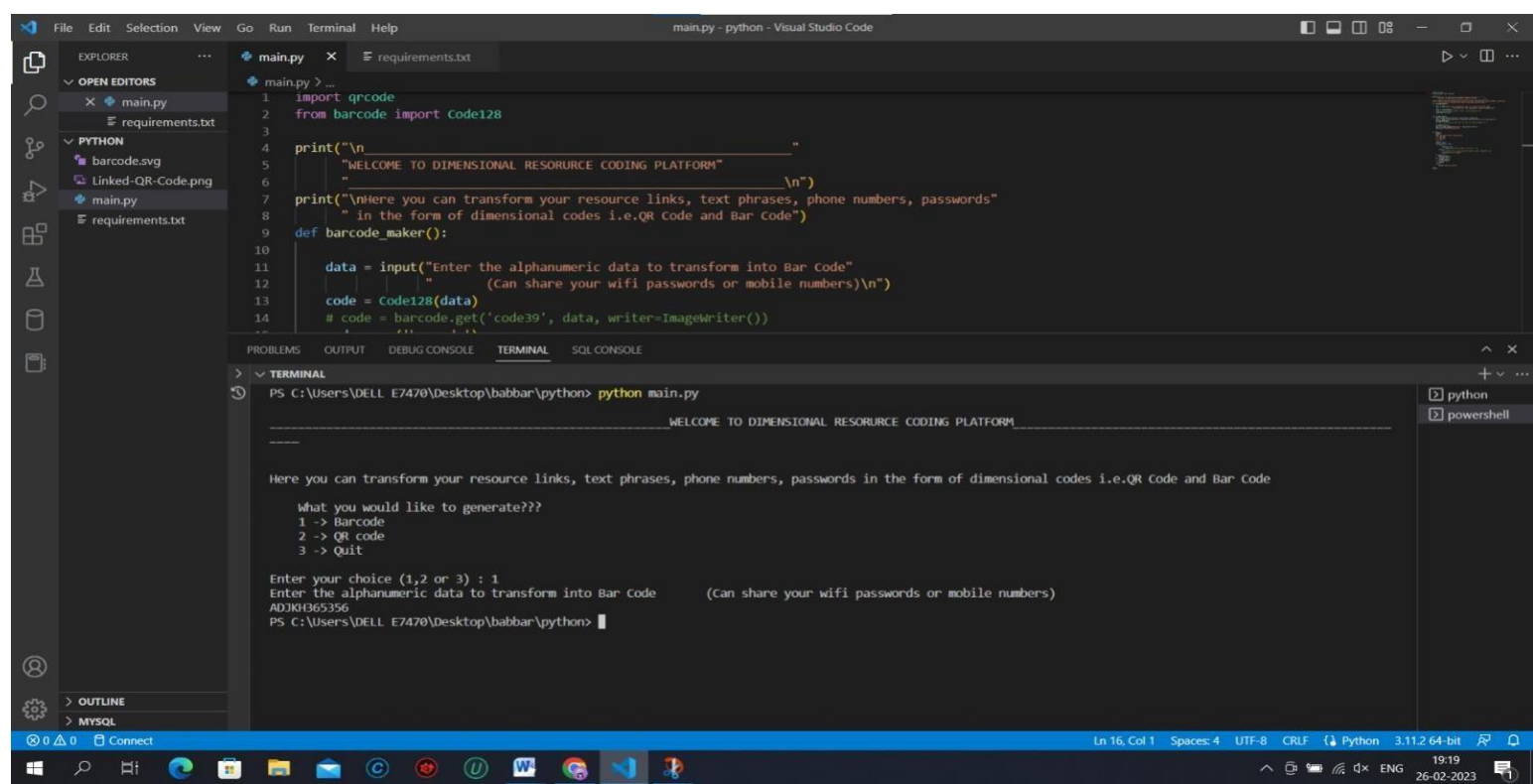
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WELCOME TO DIMENSIONAL RESORUCE CODING PLATFORM
-----

Here you can transform your resource links, text phrases, phone numbers, passwords in the form of dimensional codes i.e.QR Code and Bar Code

What you would like to generate???
1 -> Barcode
2 -> QR code
3 -> Quit

Enter your choice (1,2 or 3) : 
```

**Fig 6.1** Initial User Interface



```
main.py
1 import qrcode
2 from barcode import Code128
3
4 print("\n
5     WELCOME TO DIMENSIONAL RESORUCE CODING PLATFORM
6     \n")
7 print("\nHere you can transform your resource links, text phrases, phone numbers, passwords
8     in the form of dimensional codes i.e.QR Code and Bar Code")
9 def barcode_maker():
10
11     data = input("Enter the alphanumeric data to transform into Bar Code
12                 (Can share your wifi passwords or mobile numbers)\n")
13     code = Code128(data)
14     # code = barcode.get('code39', data, writer=ImageWriter())
```

```
PS C:\Users\DELL E7470\Desktop\babbar\python> python main.py

-----
WELCOME TO DIMENSIONAL RESORUCE CODING PLATFORM
-----

Here you can transform your resource links, text phrases, phone numbers, passwords in the form of dimensional codes i.e.QR Code and Bar Code

What you would like to generate???
1 -> Barcode
2 -> QR code
3 -> Quit

Enter your choice (1,2 or 3) : 1
Enter the alphanumeric data to transform into Bar Code      (Can share your wifi passwords or mobile numbers)
ADJ0U65356
PS C:\Users\DELL E7470\Desktop\babbar\python> 
```

**Fig 6.2** Interface when user chose barcode

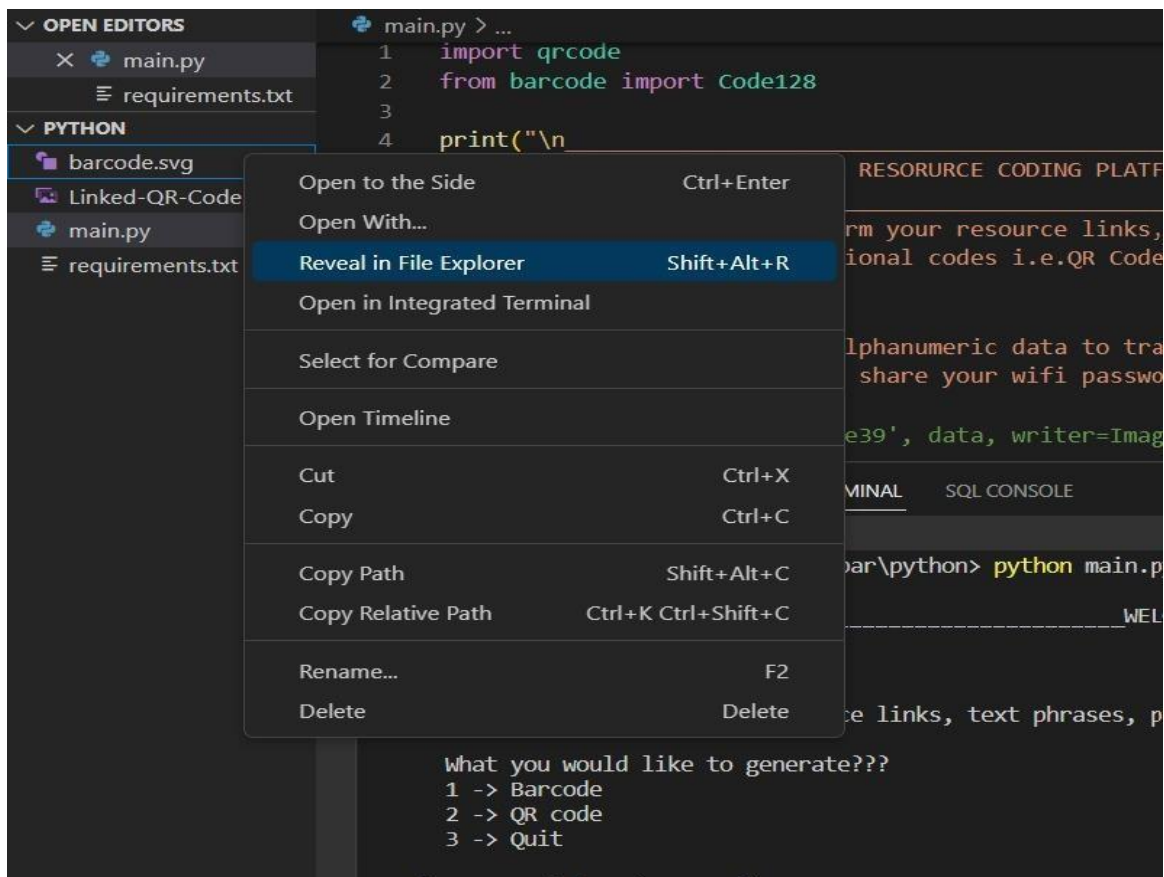


Fig 6.2.1 .svg file created

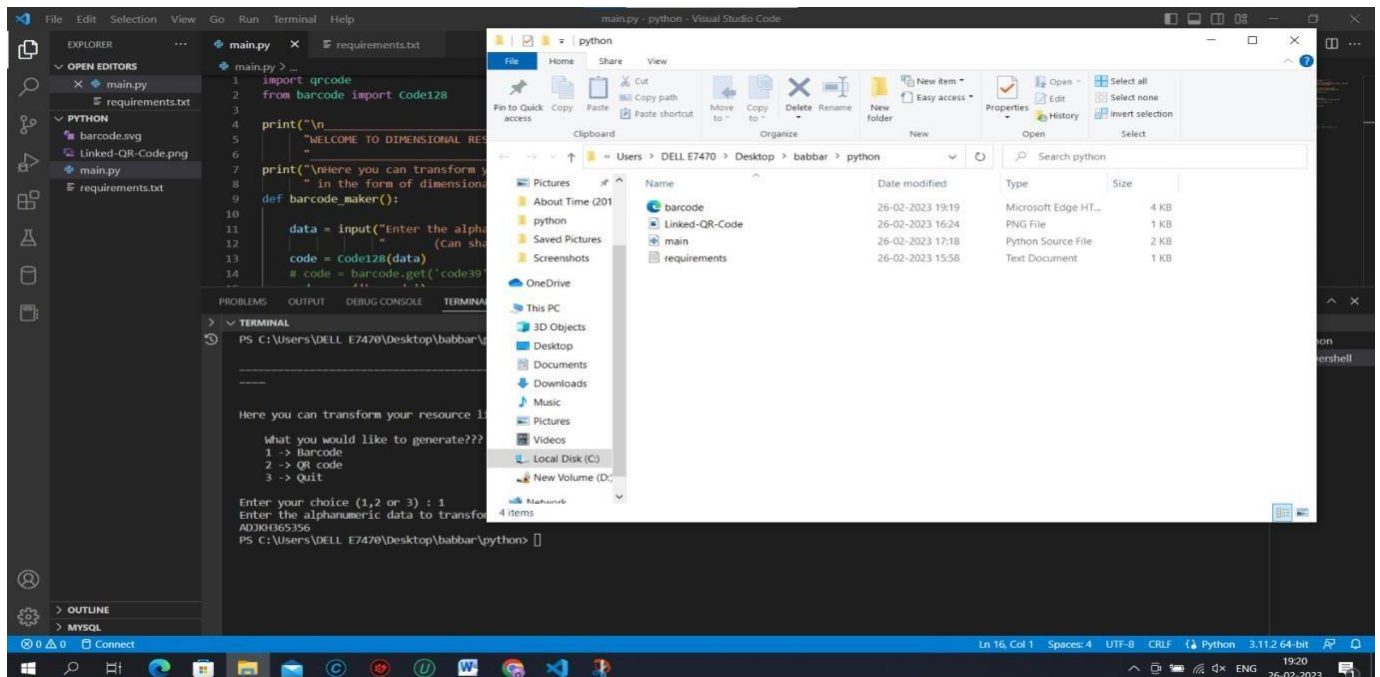
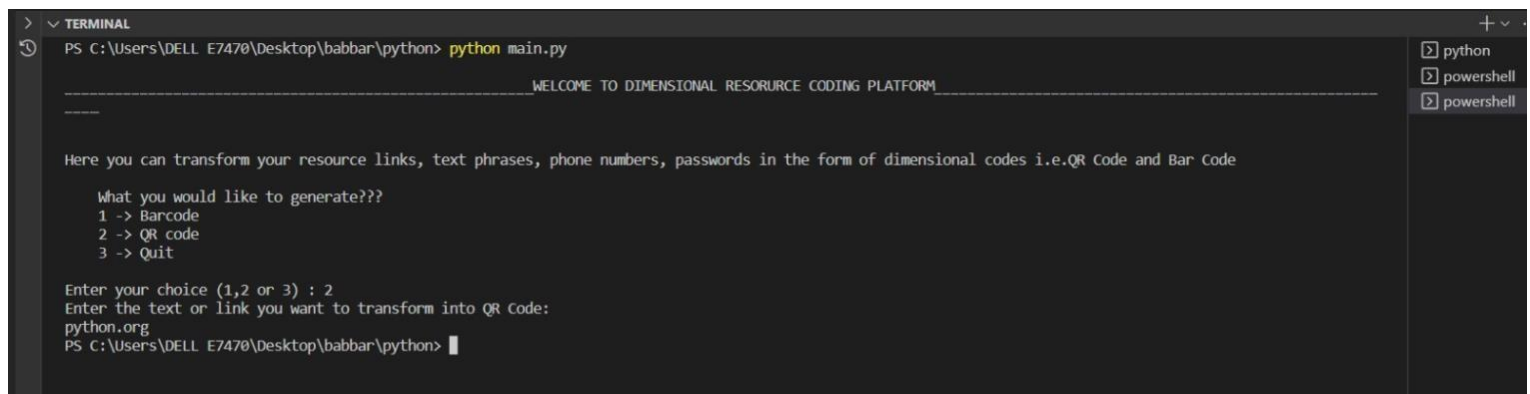


Fig 6.2.2 .svg file revealed in file explorer



**Fig 6.2.3** Bar code generated



**Fig 6.3** Interface when user chose QR Code

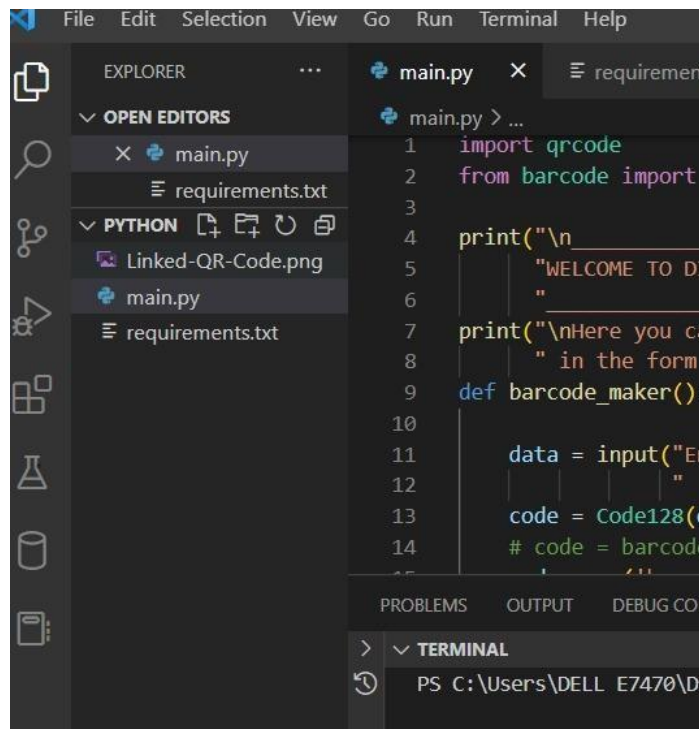


Fig 6.3.1 .png file created

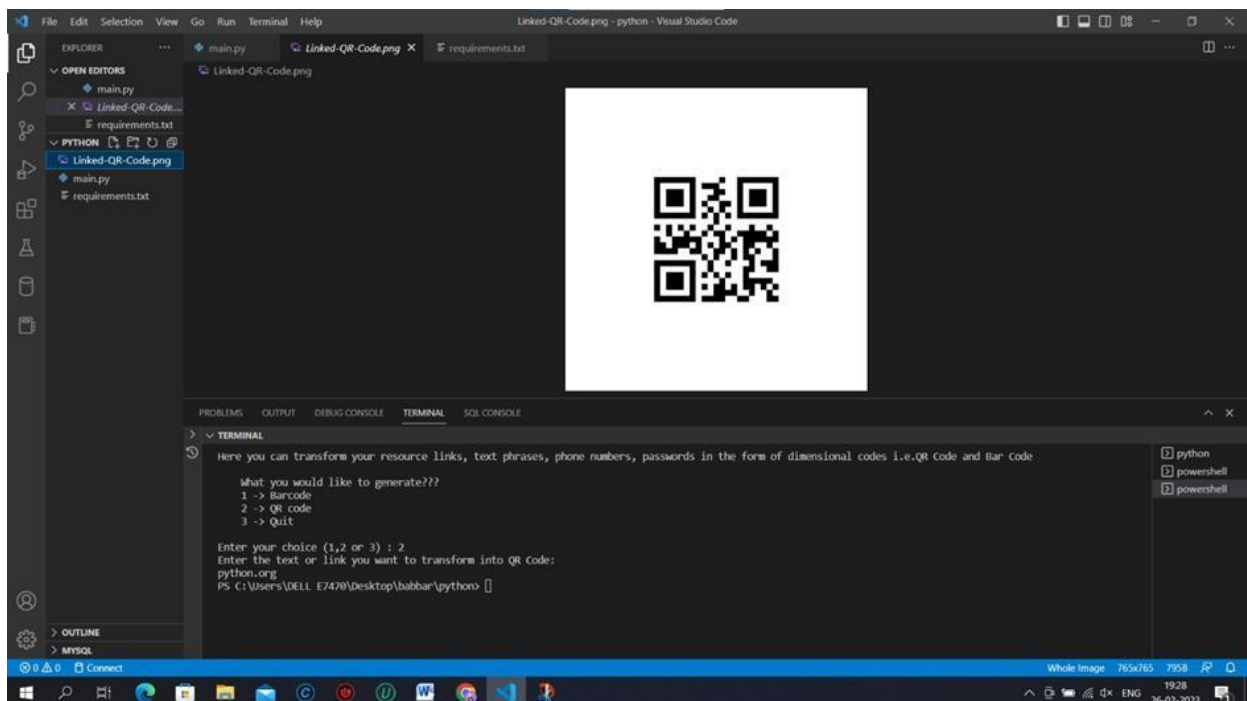
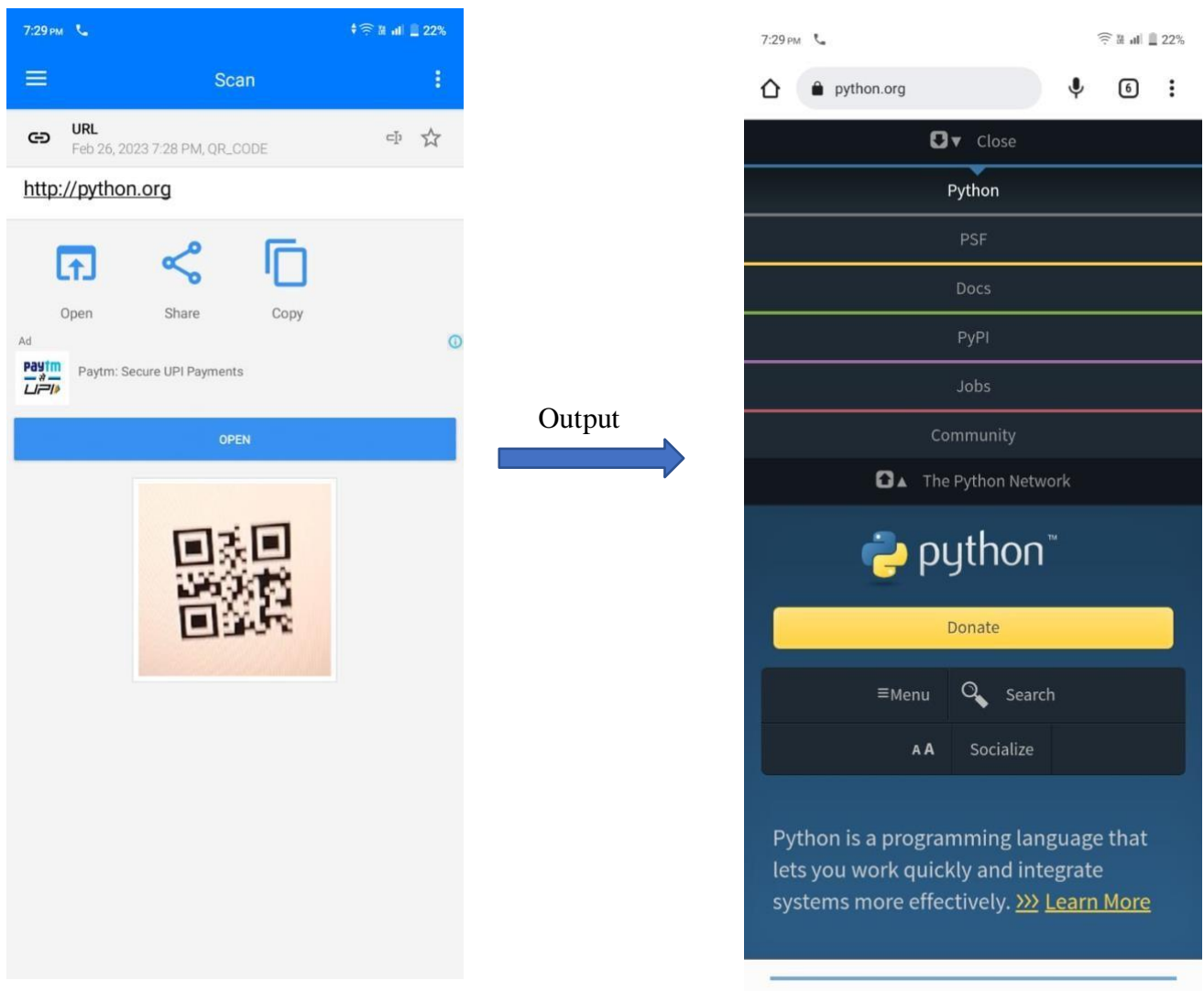


Fig 6.3.2 QR Code generated



**Fig 6.3.3** On scanning QR Code

**Implementation Summary** - In summary, the implementation of the QR Code and Barcode generator project can be done using Python programming language, qrcode and barcode libraries, an IDE, a user interface, and a structured codebase. The execution of the project involves installing the required tools, setting up the project, writing the code, and executing the main file using the Python interpreter.



## Chapter-7

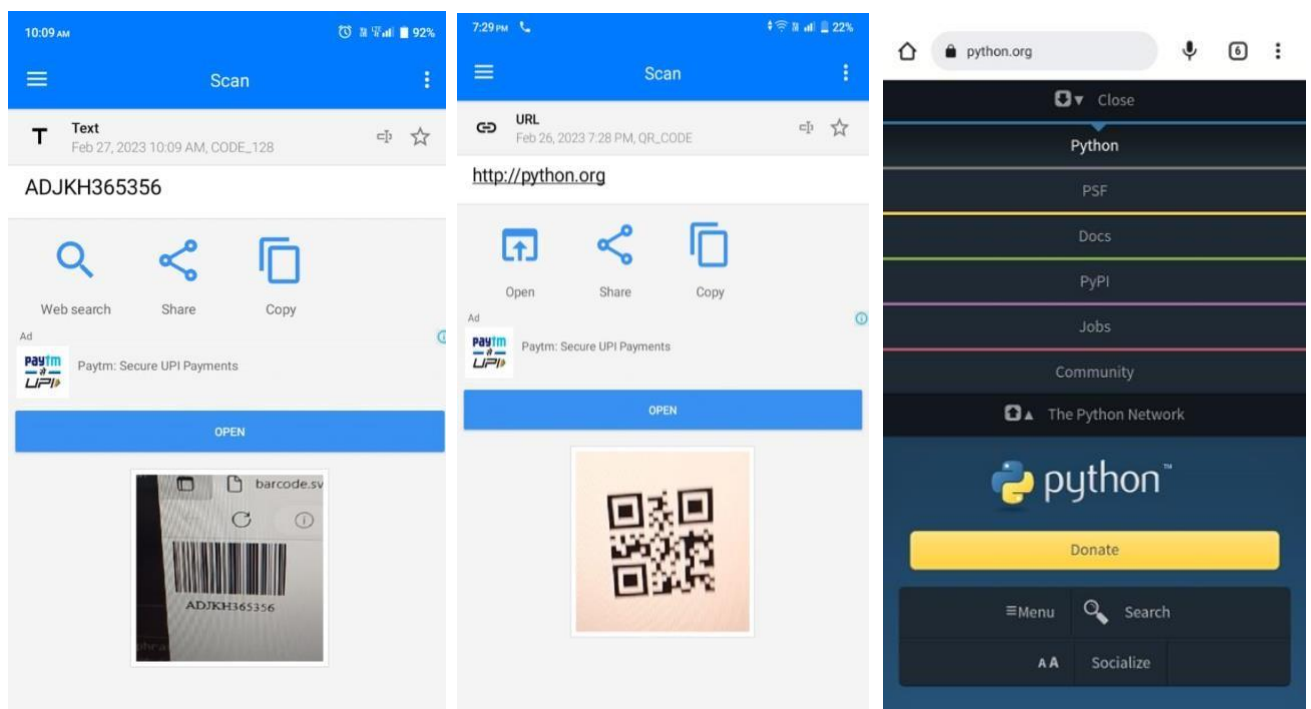
# RESULT

The result of the given program is the generation of barcode and QR code images based on the user input.

If the user chooses the Barcode option, they are prompted to enter an alphanumeric data such as a mobile number or wifi password. The program then generates a Code 128 barcode and saves it as an image file named 'barcode.png' in the same directory.

If the user chooses the QR code option, they are prompted to enter a text or a link that they want to transform into a QR code. The program generates a QR code using the entered data and saves it as an image file named 'Linked-QR-Code.png' in the same directory.

The generated images can be used for various purposes, such as sharing data, advertising, or inventory management. The program provides a quick and easy way for users to generate two-dimensional codes without requiring any technical knowledge.



**Fig 7.1** Final output after Bar Code and QR Code scanning



## Chapter-8

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### FUTURE SCOPE

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QR codes and bar codes are becoming one of the most prime facet in cashless transactions. These codes are slowly becoming first preference for many users in the recent times. The main limitation of QR codes and and bar codes is that they are only being used to redirect to a webpage or website but they are not collecting any information on their own. If in this hugely data driven world, if these codes start to collect information and start a two-way transaction then it will surely stabilize in this technology market for future years.

There are several ways in which this program could be expanded or improved:

- **Adding more barcode formats:** The barcode library supports several barcode formats, such as Code39, EAN-13, and UPC-A. The program could be modified to allow the user to choose between generating different types of barcodes.
- **Customizing the barcode and QR code images:** The program currently generates black-and-white images for both barcodes and QR codes. However, it could be modified to allow the user to customize the colors and styles of the codes.
- **Generating codes from data in a file:** The program currently prompts the user to input the data for the barcode or QR code. However, it could be modified to read the data from a file, allowing the user to generate codes from larger datasets.
- **Generating codes programmatically:** The program currently requires user input to generate the codes. However, it could be modified to generate codes programmatically, allowing developers to integrate the code generation into other applications.
- **Adding error handling:** The program currently does not have robust error handling. For example, if the barcode or qrcode libraries encounter an error during code generation, the program may crash. Adding error handling would make the program more reliable and user-friendly.

Overall, there are several ways in which this program could be expanded or improved to make it more useful and flexible.

## **Chapter-9**

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# **CONCLUSION**

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The above program is a practical and useful tool for generating two-dimensional codes in the form of barcodes and QR codes. It offers a user-friendly interface and clear instructions for easy use, making it accessible to both novice and experienced users.

One of the most significant advantages of this program is its versatility in terms of application. Barcodes and QR codes are widely used in different fields, such as inventory management, advertising, and contact sharing. By providing a simple and efficient way of generating these codes, this program can benefit users in different contexts.

For example, a business owner can use this program to generate barcodes for their inventory items, making it easy to manage stock levels and track sales. Similarly, a marketer can use QR codes to promote their products and services by adding them to brochures, business cards, and billboards. Additionally, individuals can use this program to share contact information with others without revealing personal details such as phone numbers or email addresses.

Overall, the given program offers a practical and valuable solution for generating two-dimensional codes with various applications. Its ease of use and versatility make it a valuable tool for both personal and professional use.

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