Job No: 03

Job Name: QR Code and Barcode generator and decoding

Objective: Create QR codes and barcodes in Python, save them as pictures, and then read and extract data from them.

Algorithm:

1. **Generate QR Code**:
    - Initialize a QR code object with specified parameters such as version, error correction level, box size, and border.
    - Add the data to be encoded to the QR code object.
    - Generate the QR code image using the specified parameters.
2. **Generate Barcode**:
    - Initialize a barcode object (EAN-13 format) with the desired value.
    - Generate the barcode image.
3. **Save Images**:
    - Save the generated QR code and barcode images to the local filesystem.
4. **Decode QR Code and Barcode**:
    - Load the saved QR code and barcode images.
    - Use the **pyzbar** library to decode the images and extract the encoded data.
5. **Print Results**:
    - Print the decoded data from the QR code and barcode.

Program:

Generating QR Code:

```
import qrcode

qr = qrcode.QRCode(
    version=1,
    error_correction=qrcode.constants.ERROR_CORRECT_L,
    box_size=10,
    border=4,
)
qr.add_data("Name: Mahfuz Ahmed Rafi\nRoll: 751921\nSemester:
3rd(Morning)\nDept: CST")
qr.make(fit=True)
```

```
img = qr.make_image(fill_color="black", back_color="white")
img.save("qrcode.png")
```

Decoding QR Code:

```
from pyzbar.pyzbar import decode
from PIL import Image

img = Image.open('qrcode.png')
result = decode(img)
for i in result:
    print(i.data.decode("utf-8"))
```

Generating Barcode:

```
import barcode
from barcode.writer import ImageWriter

ean = barcode.get('ean13', '1502274722751921', writer=ImageWriter())
filename = ean.save('barcode')
print(f"Barcode saved as: {filename}")
```

Decoding Barcode:

```
from pyzbar.pyzbar import decode
from PIL import Image

# Load the barcode image
barcode_image = Image.open('barcode.png')

# Decode the barcode
decoded_objects = decode(barcode_image)

# Print decoded barcode value
if decoded_objects:
    barcode_value = decoded_objects[0].data.decode('utf-8')
    print("Decoded barcode value:", barcode_value)
else:
    print("No barcode detected.")
```

Output:

Generating QR Code:

Decoding QR Code:

Name: Mahfuz Ahmed Rafi

Roll: 751921

Semester: 3rd(Morning)

Dept: CST

Generating Barcode:

Barcode saved as: barcode.png

Decoding Barcode:

Decoded barcode value: 1502274722750