

GeeksforGeeks

A computer science portal for geeks

[Practice](#)[GATE CS](#)[Placements](#)[Videos](#)[Contribute](#)[Login/Register](#)

Quick Links for Python

[Recent Articles](#)[MCQ / Quizzes](#)[Practice Problems](#)

Basics

[Introduction](#)[New Generation Language](#)[Keywords, Set 1 Set 2](#)[Explore More...](#)

Variables

[Variables, Expressions & Functions](#)[Global and Local Variables](#)[Type Conversion](#)[Explore More...](#)

Operators

[Increment and Decrement Operator](#)[Teranry Operator & Divison Operator](#)[Logical and Bitwise Not Operators on Boolean](#)[Any & ALL](#)

Operator Functions Set 1 & Set 2
Data Types
Introduction
Arrays Set 1, Set 2
String Methods Set 1, Set 2, Set 3
String Template Class & String Formatting using %
List Methods Set 1, Set 2, Set 3
Tuples & Sets
Dictionary Methods Set 1, Set 2
ChainMap
Explore More...
Control Flow
Loops and Control Statements
Counters & Accessing Counters
Iterators & Iterator Functions Set 1, Set 2
Generators
Explore More...
Functions
Function Decorators
Returning Multiple Values
Yield instead of Return
Python Closures & Coroutine
Explore More...
Modules
Introduction



Numeric Functions & Logarithmic and Power functions	
Calender Functions Set 1, Set 2	
Complex Numbers Introduction & Important functions	
Explore More...	
Object Oriented Concepts	
Class, Object and Members	
Data Hiding and Object Printing	
Inheritance, Subclass and super	
Class method vs static method & Class or Static Variables	
Explore More...	
Exception Handling	
Exception Handling	
User-Defined Exceptions	
Built-in Exceptions	
Libraries and Functions	
Timeit	
Numpy Set 1, Set 2	
Get and Post	
import module & reload module	
Collection Modules Deque, Namedtuple & Heap	
Explore More...	
Machine Learning with Python	
Classifying data using Support Vector Machines(SVMs) in Python	



K means Clustering
How to get synonyms/antonyms from NLTK WordNet in Python?
Explore More...
Misc
Sql using Python & MongoDB and Python
Json formatting & Python Virtual environment
Metaprogramming with Metaclasses in Python
Python Input Methods for Competitive Programming
Explore More...
Applications and Projects
Creating a proxy webserver Set 1, Set 2
Send Message to FB friend
Twitter Sentiment Analysis & Whatsapp using Python
Desktop Notifier & Junk File Organizer
Explore More...

Reading and Generating QR codes in Python using QR-tools

This article aims to introduce the use of the python library: qrcode. This library can be used to both read QR codes and generate them.

What are QR codes?

QR code, or quick response code, is a trademark for a type of 2 dimensional barcode. 2 dimensional barcodes are similar to one dimensional barcodes, but can store more information per unit area.



Installation and Dependencies

1. **Debian Linux:** qrtools can be installed on debian based linux systems with the following commands

```
sudo apt-get update
sudo apt-get install python-qrtools
```

The following dependencies must be installed as well

```
[sudo] pip install pypng
[sudo] pip install zbar
[sudo] pip install pillow
```

2. **Windows:** qrtools can be installed on windows by downloading the file from [here](#). On downloading and extraction, run the following command from inside the folder

```
python setup.py install
```

Generate a QR Code

qrtools contains a class QR (can be viewed in the source code), for which we must initially create an object. The object takes the following arguments

1. data
2. pixel_size
3. level
4. margin_size
5. data_type

To create a QR code with default settings, we must simply specify the data while creating the object. Note that the data must be a unicode object if non-ASCII objects are going to be used.

```
# Python 2.x program to generate QR code
from qrtools
import QR

# creates the QR object
my_QR = QR(data = u"Example")

# encodes to a QR code
my_QR.encode()
```

[Run on IDE](#)

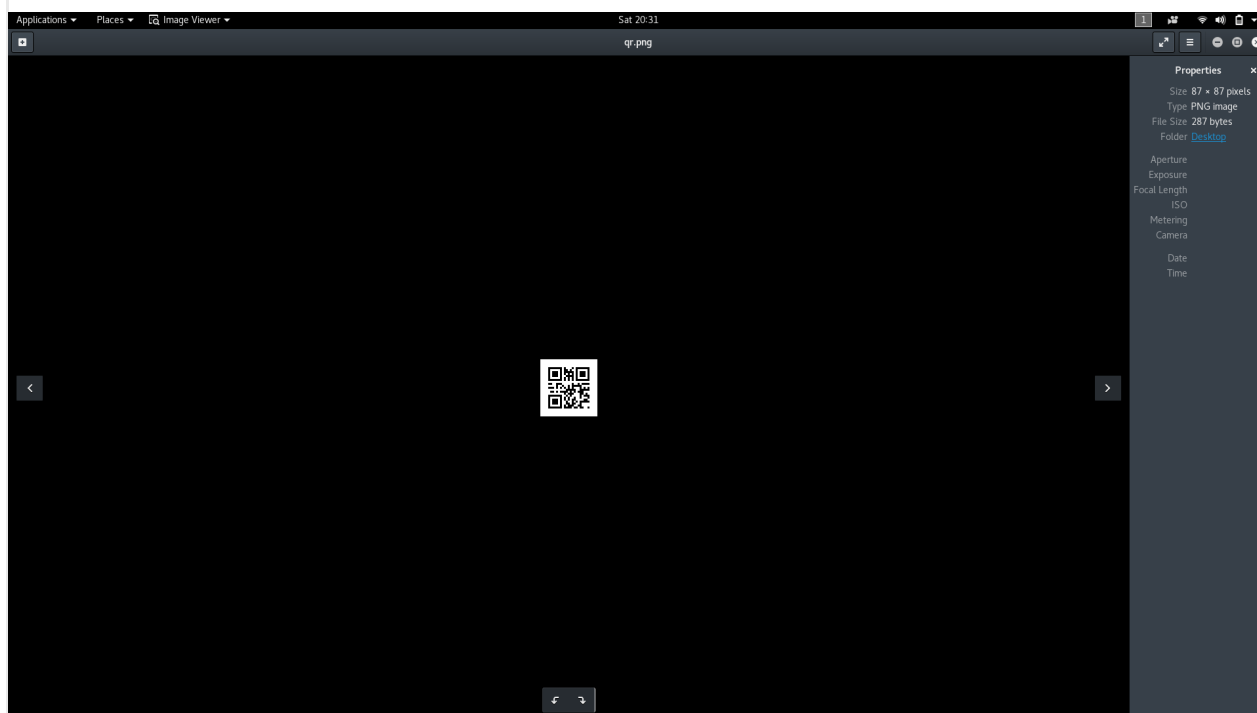
If the program runs successfully, it returns a value of 0, and the QR code is stored in the tmp folder. To know the exact location, use the following command

```
print my_QR.filename
```



Sample output

/tmp/qr-1496334996.385343/7489ebbcc2a00056ddaaaac190bce473e5c03696ea1bd8ed83cf59a174283862.png



This file can now be moved to another folder as per our convenience

```
# Python 2.x program to generate QR code
from qrcode import QR

import os
my_QR = QR(data = u"Example")
my_QR.encode()

# command to move the QR code to the desktop
os.system("sudo mv " + my_QR.filename + " ~/Desktop")
```

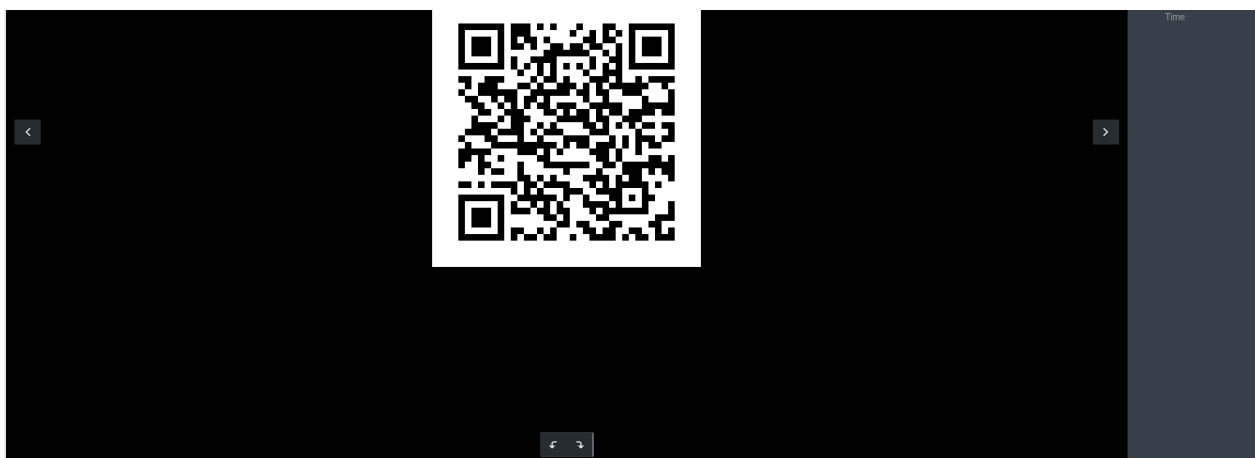
Run on IDE

The pixel value of the QR code may also be changed by specifying the value during the creation of the QR object. The default size tends to be a little small for reading using scanners on smartphones, so a size of around 10 would be ideal for such purposes, for example:

```
my_QR = QR(data = u"example", pixel_size = 10)
```

The below QR code has pixel size = 10, and has been encoded with a URL





We can also add email data, sms data, mms data, bookmarks, etc to the QR code. The following code excerpt is taken from the source code, which specifies the various datatypes that can be used along with the format of the data that would be required for its usage:

```
# use these for custom data formats eg. url, phone number, VCARD
# data should be an unicode object or a list of unicode objects
data_encode = {
    'text': lambda data: data,
    'url': encode_url,
    'email': lambda data: 'mailto:' + re.compile(
        r'^mailto:', re.IGNORECASE
    ).sub('', data),
    'emailmessage': lambda data: 'MATMSG:TO:' + data[0] + ';SUB:' + data[1] +
        ';BODY:' + data[2] + ';;',
    'telephone': lambda data: 'tel:' + re.compile(
        r'^tel:', re.IGNORECASE
    ).sub('', data),
    'sms': lambda data: 'SMSTO:' + data[0] + ':' + data[1],
    'mms': lambda data: 'MMSTO:' + data[0] + ':' + data[1],
    'geo': lambda data: 'geo:' + data[0] + ',' + data[1],
    'bookmark': lambda data: "MEBKM:TITLE:" + data[0] + ";URL:" +
        data[1] + ";;",
    # phonebook or meCard should be a list of tuples like this:
    # [('N', 'Name'), ('TEL', '231698890'), ...]
    'phonebook': lambda data: "MECARD:" + ";".join([":".join(i)
        for i in data]) + ";"
}
```

Run on IDE

From the above code, we observe the various data types that can be assigned and used while creating QR codes. For example, to use a bookmark as data we must provide data as a list, consisting of a title and the url. To accomplish this, we must do the following

```
# Python 2.x program to generate QR code
from qrtools import QR

# creates the QR object
my_QR = QR(data = [u"geeksforgeeks", u"http://www.geeksforgeeks.org/"],
              data_type = 'bookmark')

# encodes to a QR code
my_QR.encode()
```

Run on IDE

Read a QR code

Scanning and reading a QR code is relatively simple. While creating the QR object, we must simply specify the path to the QR code as an argument. Suppose we are trying to decode the QR code created at the beginning of the article.

```
# Python 2.x program to Scan and Read a QR code
from qrttools import QR
my_QR = QR(filename = "home/user/Desktop/qr.png")

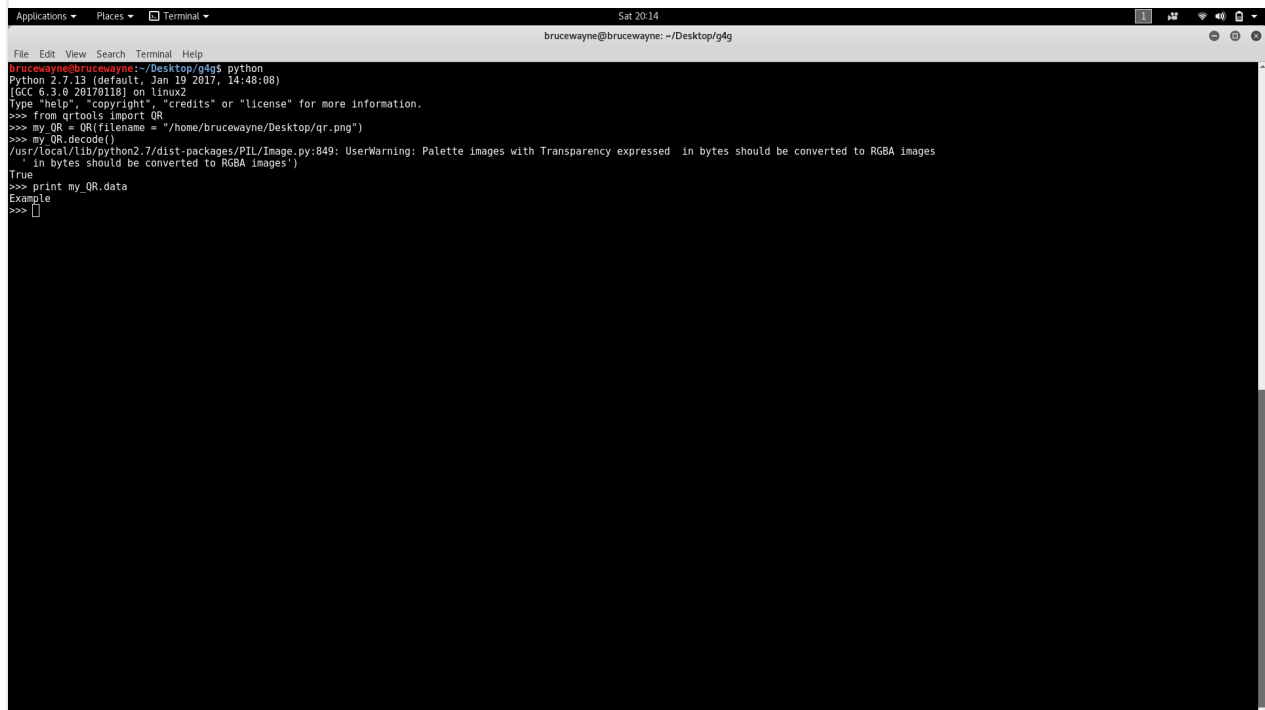
# decodes the QR code and returns True if successful
my_QR.decode()

# prints the data
print my_QR.data
```

[Run on IDE](#)

Output :

Example

A screenshot of a terminal window titled "Sat 20:14" and "brucewayne@brucewayne: ~/Desktop/g4g". The terminal shows the execution of a Python script. The output includes the Python version (2.7.13), GCC version (6.3.0), and the execution of the QR code reading script. The script successfully decodes the QR code and prints the data "Example".

```
brucewayne@brucewayne:~/Desktop/g4g$ python
Python 2.7.13 (default, Jan 19 2017, 14:48:08)
[GCC 6.3.0 20170118] on linux2
Type "help", "copyright", "credits" or "license()" for more information.
>>> from qrttools import QR
>>> my_QR = QR(filename = "/home/brucewayne/Desktop/qr.png")
>>> my_QR.decode()
/usr/local/lib/python2.7/dist-packages/PIL/Image.py:849: UserWarning: Palette images with Transparency expressed in bytes should be converted to RGBA images
  in bytes should be converted to RGBA images')
True
>>> print my_QR.data
Example
>>>
```

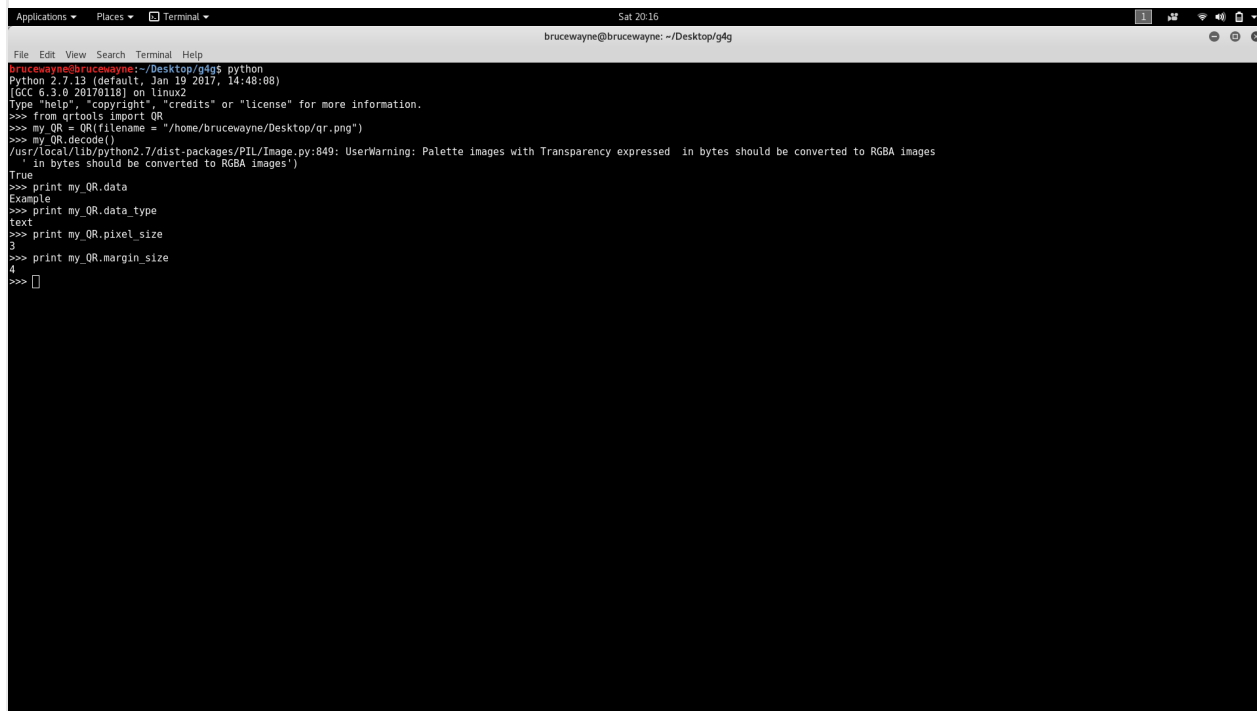
We may also print the values of the other parameters passed while creating the QR object to generate the QR code, for example, using the same QR code generated at the beginning of the article, additionally adding these print statements would give the following additional output

```
print my_QR.data_type
print my_QR.pixel_size
print my_QR.margin_size
```



Output:


```
text
3
4
```



```
Applications ▾ Places ▾ Terminal ▾ Sat 20:16
brucewayne@brucewayne: ~/Desktop/g4g
File Edit View Search Terminal Help
brucewayne@brucewayne:~/Desktop/g4g$ python
Python 2.7.13 (default, Jan 19 2017, 14:48:08)
[GCC 6.3.0 20170118] on linux2
Type "help", "copyright", "credits" or "license()" for more information.
>>> from qrcode import QR
>>> my_QR = QR(filename = "/home/brucewayne/Desktop/qr.png")
>>> my_QR.decode()
/usr/local/lib/python2.7/dist-packages/PIL/Image.py:849: UserWarning: Palette images with Transparency expressed in bytes should be converted to RGBA images
  in bytes should be converted to RGBA images')
True
>>> print my_QR.data
Example
>>> print my_QR.data_type
text
>>> print my_QR.pixel_size
3
>>> print my_QR.margin_size
4
>>>
```

This article is contributed by **Deepak Srivatsav**. If you like GeeksforGeeks and would like to contribute, you can also write an article using contribute.geeksforgeeks.org or mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above.



GBlog Python

Recommended Posts:

[fnmatch – Unix filename pattern matching in Python](#)[Performing Google Search using Python code](#)[Object Oriented Programming in Python | Set 1 \(Class, Object and Members\)](#)[Implementing Web Scrapping in Python with BeautifulSoup](#)[copyreg — Register pickle support functions](#)

([Login](#) to Rate and Mark)

2

Average Difficulty : **2/5.0**
Based on **1** vote(s)



Add to TODO List



Mark as DONE

Writing code in comment? Please use ide.geeksforgeeks.org, generate link and share the link here.

Load Comments

Share this post!

@geeksforgeeks, Some rights reserved

[Contact Us!](#)

[About Us!](#)

[Careers!](#)

[Privacy Policy](#)

