**QR Code Tutorial**

**Data Analysis**

A QR code encodes a string of text. The QR code standard has four modes for encoding text: numeric, alphanumeric, byte, and Kanji. Each mode encodes the text as a string of bits (1s and 0s), but each mode uses a different method for converting the text into bits. Each method is optimized to generate the shortest possible string of bits for that data type. This page explains how to identify which mode to use.

**The QR Code Modes**

The four encoding modes include the following characters:

* Numeric mode is for decimal digits 0 through 9.
* Alphanumeric mode is for the decimal digits 0 through 9, as well as uppercase letters (not lowercase!), and the symbols $, %, \*, +, -, ., /, and : as well as a space. All of the supported characters for alphanumeric mode are listed in the left column of this alphanumeric table.
* Byte mode, by default, is for characters from the ISO-8859-1 character set. However, some QR code scanners can automatically detect if UTF-8 is used in byte mode instead.
* Kanji mode is for double-byte characters from the Shift JIS character set. While UTF-8 can encode Kanji characters, it must use three or four bytes to do so. Shift JIS, on the other hand, uses just two bytes to encode each Kanji character, so Kanji mode compresses Kanji characters more efficiently. If the entire input string consists of characters in the double-byte range of Shift JIS, use Kanji mode. It is also possible to use multiple modes within the same QR code, as described later on this page.

**alphanumeric table**

0 0

1 1

2 2

3 3

4 4

5 5

6 6

7 7

8 8

9 9

A 10

B 11

C 12

D 13

E 14

F 15

G 16

H 17

I 18

J 19

K 20

L 21

M 22

N 23

O 24

P 25

Q 26

R 27

S 28

T 29

U 30

V 31

W 32

X 33

Y 34

Z 35

36

$ 37

% 38

\* 39

+ 40

- 41

. 42

/ 43

: 44