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bsite to
re are certain
a-z, numbers
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lid format that

replacing all

the characters that are not allowed by a % sign followed by two hexadecimal digits. These two hexadecimal values represent the numerical values of the character in the ASCII character set. For example a space is not acceptable in a URL and is replaced by '%20' or a '+' sign while encoding. Similarly a \$ sign is replaced by '%24'. **Reserved Characters:** There are certain characters which sometimes have special meanings in the URL and it can be used in both ways. For example the '/' character is a reserved character and it has a special meaning when being used as a delimiter to separate the paths of a URL. Here it is used by encoding it to '%2F'. Else when it has no special purpose it can be used normally. There are many reserved characters which are listed below:

Character Encoded Form

!	%21
*	%2A
'	%27
(%28
)	%29
;	%3B
:	%3A
@	%40
&	%26
=	%3D
+	%2B
\$	%24
,	%2C
/	%2F
?	%3F
#	%23
[%5B
]	%5D

Some characters need to be encoded while some don't need to be. Here is the classification shows the group of characters that need to be encoded.

- **Safe Characters:** Alphanumeric i.e. 0-9, a-z and A-Z, special characters \$, -, _, ., +, !, *, ', (,), are reserved characters used for their reserved purposes. These characters have no need to be encoded.
- **ASCII Control characters:** It includes the characters ranging from 00-1F in hex (0-31 decimal) and 7F (127 decimal). These characters needs to be encoded.
- **Non-ASCII Control characters:** It includes 80-FF in hex (128-255 decimal). These characters needs to be encoded.
- **Reserved characters:** These characters are used for special purpose and they requires encoding.
- **Unsafe characters:** These character can be misunderstood within URLs for various reasons. So it requires encoding. The characters < and > are unsafe because they are used as the delimiters around URLs in free text, the quote mark (" ") is unsafe as it is used to delimit URLs in some systems. The unsafe characters list are given below:

Character Encoded Form

space	%20
"	%22
<	%3C
>	%3E
#	%23
%	%25
{	%7B
}	%7D
	%7C
\	%5C
^	%5E
~	%7E
[%5B

] %5D

A list of complete URL Encoded Characters is given below:

CHARACTER ENCODED FORM

backspace	%08
tab	%09
linefeed	%0A
c return	%0D
space	%20
!	%21
“	%22
#	%23
\$	%24
%	%25
&	%26
‘	%27
(%28
)	%29
*	%2A
+	%2B
,	%2C
—	%2D
.	%2E
/	%2F
0	%30
1	%31
2	%32
3	%33
4	%34
5	%35

6	%36
7	%37
8	%38
9	%39
:	%3A
;	%3B
<	%3C
=	%3D
>	%3E
?	%3F
@	%40
A	%41
B	%42
C	%43
D	%44
E	%45
F	%46
G	%47
H	%48
I	%49
J	%4A
K	%4B
L	%4C
M	%4D
N	%4E
O	%4F
P	%50
Q	%51
R	%52
S	%53

T	%54
U	%55
V	%56
W	%57
X	%58
Y	%59
Z	%5A
[%5B
\	%5C
]	%5D
^	%5E
_	%5F
`	%60
a	%61
b	%62
c	%63
d	%64
e	%65
f	%66
g	%67
h	%68
i	%69
j	%6A
k	%6B
l	%6C
m	%6D
n	%6E
o	%6F
p	%70
q	%71

r	%72
s	%73
t	%74
u	%75
v	%76
w	%77
x	%78
y	%79
z	%7A
{	%7B
 	%7C
}	%7D
~	%7E
	%7F
`	%E2%82%AC
	%81
,	%E2%80%9A
f	%C6%92
„	%E2%80%9E
...	%E2%80%A6
†	%E2%80%A0
‡	%E2%80%A1
^	%CB%86
%o	%E2%80%B0
Š	%C5%A0
‹	%E2%80%B9
Œ	%C5%92
	%C5%8D
Ž	%C5%BD
	%8F

	%C2%90
‘	%E2%80%98
’	%E2%80%99
“	%E2%80%9C
”	%E2%80%9D
•	%E2%80%A2
—	%E2%80%93
—	%E2%80%94
~	%CB%9C
TM	%E2%84
Š	%C5%A1
›	%E2%80
œ	%C5%93
	%9D
ž	%C5%BE
ÿ	%C5%B8
	%C2%A0
ı	%C2%A1
¢	%C2%A2
£	%C2%A3
¤	%C2%A4
¥	%C2%A5
¡	%C2%A6
§	%C2%A7
¨	%C2%A8
©	%C2%A9
ª	%C2%AA
«	%C2%AB
¬	%C2%AC
	%C2%AD

®	%C2%AE
—	%C2%AF
◦	%C2%B0
±	%C2%B1
²	%C2%B2
³	%C2%B3
´	%C2%B4
µ	%C2%B5
¶	%C2%B6
·	%C2%B7
¸	%C2%B8
¹	%C2%B9
º	%C2%BA
»	%C2%BB
¼	%C2%BC
½	%C2%BD
¾	%C2%BE
¿	%C2%BF
À	%C3%80
Á	%C3%81
Â	%C3%82
Ã	%C3%83
Ä	%C3%84
Å	%C3%85
Æ	%C3%86
Ç	%C3%87
È	%C3%88
É	%C3%89
Ê	%C3%8A
Ë	%C3%8B

ì	%C3%8C
í	%C3%8D
î	%C3%8E
ï	%C3%8F
Ð	%C3%90
Ñ	%C3%91
Ò	%C3%92
Ó	%C3%93
Ô	%C3%94
Õ	%C3%95
Ö	%C3%96
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