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nixCraft: Linux Tips, Hacks, Tutorials, And Ideas In Blog Format
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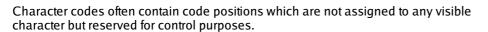# sed Find and Replace ASCII Control Codes / Nonprintable Characters

Posted by Vivek Gite <vivek@nixcraft.com>

Q. How do I find and replace character codes (control-codes or nonprintable characters) such as ctrl+a using sed command under UNIX like operating systems?

A. ASCII is the American Standard Code for Information Interchange. It is a 7-bit code. Many 8-bit codes (such as ISO 8859-1, the Linux default character set) contain ASCII as their lower half. The international counterpart of ASCII is known as ISO 646.

Character codes often contain code positions which are not assigned to any visible character but reserved for control purposes.

[1]

You can easily find and replace them with the help of shell substitute:

```
sed -e 's/'$(echo "octal-value")'/replace-word/g'
```

OR

```
sed 's/'`echo "octal-value"`'/replace-word/g'
```

To replace 0x1B (033 octal) with ASCII letters, enter:

```
sed 's/'`echo "\033"`'/foo/g'
```

OR

```
sed -e 's/'$(echo "\033")'/ESC/g'
```

You can view ascii table by reading its man page or here is the ascii table for your references:

```
 The following table contains the 128 ASCII characters.

     C program '\X' escapes are noted.

 Oct   Dec   Hex   Char                          Oct   Dec   Hex   Char
 ----------------------------------------------------------------------
 000   0     00    NUL '\0'                      100   64    40    @
 001   1     01    SOH (start of heading)        101   65    41    A
 002   2     02    STX (start of text)           102   66    42    B
 003   3     03    ETX (end of text)             103   67    43    C
 004   4     04    EOT (end of transmission)     104   68    44    D
 005   5     05    ENQ (enquiry)                 105   69    45    E
 006   6     06    ACK (acknowledge)             106   70    46    F
 007   7     07    BEL '\a' (bell)               107   71    47    G
 010   8     08    BS  '\b' (backspace)          110   72    48    H
 011   9     09    HT  '\t' (horizontal tab)     111   73    49    I
 012   10    0A    LF  '\n' (new line)           112   74    4A    J
 013   11    0B    VT  '\v' (vertical tab)       113   75    4B    K
 014   12    0C    FF  '\f' (form feed)          114   76    4C    L
 015   13    0D    CR  '\r' (carriage ret)       115   77    4D    M
 016   14    0E    SO  (shift out)               116   78    4E    N
 017   15    0F    SI  (shift in)                117   79    4F    O
 020   16    10    DLE (data link escape)        120   80    50    P
 021   17    11    DC1 (device control 1)        121   81    51    Q
 022   18    12    DC2 (device control 2)        122   82    52    R
 023   19    13    DC3 (device control 3)        123   83    53    S
 024   20    14    DC4 (device control 4)        124   84    54    T
 025   21    15    NAK (negative ack.)           125   85    55    U
```

```
026    22    16    SYN (synchronous idle)      126    86    56    V
027    23    17    ETB (end of trans. blk)     127    87    57    W
030    24    18    CAN (cancel)                130    88    58    X
031    25    19    EM  (end of medium)         131    89    59    Y
032    26    1A    SUB (substitute)            132    90    5A    Z
033    27    1B    ESC (escape)                133    91    5B    [
034    28    1C    FS  (file separator)        134    92    5C    \    '\\'
035    29    1D    GS  (group separator)       135    93    5D    ]
036    30    1E    RS  (record separator)      136    94    5E    ^
037    31    1F    US  (unit separator)        137    95    5F    _
040    32    20    SPACE                       140    96    60    `
041    33    21    !                           141    97    61    a
042    34    22    "                           142    98    62    b
043    35    23    #                           143    99    63    c
044    36    24    $                           144    100   64    d
045    37    25    %                           145    101   65    e
046    38    26    &                           146    102   66    f
047    39    27    ´                           147    103   67    g
050    40    28    (                           150    104   68    h
051    41    29    )                           151    105   69    i
052    42    2A    *                           152    106   6A    j
053    43    2B    +                           153    107   6B    k
054    44    2C    ,                           154    108   6C    l
055    45    2D    -                           155    109   6D    m
056    46    2E    .                           156    110   6E    n
057    47    2F    /                           157    111   6F    o
060    48    30    0                           160    112   70    p
061    49    31    1                           161    113   71    q
062    50    32    2                           162    114   72    r
063    51    33    3                           163    115   73    s
064    52    34    4                           164    116   74    t
065    53    35    5                           165    117   75    u
066    54    36    6                           166    118   76    v
067    55    37    7                           167    119   77    w
070    56    38    8                           170    120   78    x
071    57    39    9                           171    121   79    y
072    58    3A    :                           172    122   7A    z
073    59    3B    ;                           173    123   7B    {
074    60    3C    <                           174    124   7C    |
075    61    3D    =                           175    125   7D    }
076    62    3E    >                           176    126   7E    ~
077    63    3F    ?                           177    127   7F    DEL
```

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