CS5354
UNIX TOOL PROGRAMMING

Sed : STREAM EDITOR

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WHAT IS SED?

- A non-interactive stream editor
- Interprets sed instructions and performs actions

- Use sed to:
  - Automatically perform edits on file(s)
  - Simplify doing the same edits on multiple files
  - Write conversion programs

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Sed: THE STREAM EDITOR

Sed is a multipurpose tool which combine the work of several filters.

It uses very few options but all are very useful

Sed perform noninteractive operation on a data stream.

Syntax:

Sed [options] 'address action' files(s)

Adressing done in two ways

By one or two line number   By specifing a /-enclosed pattern which occurs in a line

LINE ADDRESS

Examples:

$`sed '3q' input-file`

show only line 3 (address:3, action :quit)

```
adhoc@adhoc: ~/Desktop
File Edit View Search Terminal Help
adhoc@adhoc:~/Desktop$ sed '3q' emp.lst
2233 | a.k.shukla         | g.m.      | sales      | 12/12/52 | 6000
9876 | jai sharma         | director  | production | 12/03/50 | 7000
5678 | sumit chakrobarty  | d.g.m.    | marketing  | 19/04/43 | 6000
adhoc@adhoc:~/Desktop$
```

`sed -n '1,2p' input-file`

print 2 line (option:n lines, address:
   start1,2p: print 2 line)

```
adhoc@adhoc:~/Desktop$ sed -n '1,2p' emp.lst
2233 | a.k.shukla         | g.m.      | sales      | 12/12/52 | 6000
9876 | jai sharma         | director  | production | 12/03/50 | 7000
adhoc@adhoc:~/Desktop$ sed -n '2,2p' emp.lst
9876 | jai sharma         | director  | production | 12/03/50 | 7000
```

LINE ADDRESS

$sed -n '$p' input-file

Print last line

Selecting line from Anywhere

$sed -n '9,11p' input-file

Select/ print line from 9 through 11

Selecting multiple groups of line

$sed -n '1,2p

7,9p

$p' input-file


```
adhoc@adhoc: ~/Desktop
File  Edit  View  Search  Terminal  Help
adhoc@adhoc:~/Desktop$ sed -n '1,2p
7,9p
$p' emp.lst
2233 | a.k.shukla       | g.m.      | sales      | 12/12/52 | 6000
9876 | jai sharma       | director  | production | 12/03/50 | 7000
6213 | karuna ganguly   | g.m.      | accounts   | 05/06/62 | 6300
1265 | s.n. dasgupta    | manager   | sales      | 12/09/63 | 5600
4290 | jayant choudhury | executive | production | 07/09/50 | 6000
0110 | v.k.agrawal      | g.m.      | marketing  | 31/12/40 | 9000
adhoc@adhoc:~/Desktop$
```

LINE ADDRESS

Negating the Action(!)

Select first two line == not select 3 through the end

$sed -n '1,2p' file == $sed -n '3,$!p' file


```
adhoc@adhoc:~/Desktop$ sed -n '1,2p' emp.lst
2233 | a.k.shukla      | g.m.     | sales      | 12/12/52 | 6000
9876 | jai sharma      | director | production | 12/03/50 | 7000
adhoc@adhoc:~/Desktop$ sed -n '3,$!p' emp.lst
2233 | a.k.shukla      | g.m.     | sales      | 12/12/52 | 6000
9876 | jai sharma      | director | production | 12/03/50 | 7000
adhoc@adhoc:~/Desktop$ 
```

Using Multiple Instruction (-e, -f)

-e: allow you to enter as many instruction as you wish

e.g
$sed -n   -e '1,2p'   -e '7,9p'   -e '$p' Input- file

Using Multiple Instruction (-e, -f)

-f: Instruction from file

   $sed -n -f inst.fil emp.lst

```
adhoc@adhoc:~/Desktop$ cat inst.fil
1,2p
7,9p
$p
adhoc@adhoc:~/Desktop$ sed -n -f inst.fil emp.lst
2233 | a.k.shukla         | g.m.       | sales      | 12/12/52 | 6000
9876 | jai sharma         | director   | production | 12/03/50 | 7000
6213 | karuna ganguly     | g.m.       | accounts   | 05/06/62 | 6300
1265 | s.n. dasgupta      | manager    | sales      | 12/09/63 | 5600
4290 | jayant choudhury   | executive| production | 07/09/50 | 6000
0110 | v.k.agrawal        | g.m.       | marketing  | 31/12/40 | 9000
adhoc@adhoc:~/Desktop$
```

We can use many instruction files.

   $sed -n -f inst1 -f inst2 emp.lst

```
adhoc@adhoc:~/Desktop$ cat inst1
1,4p
adhoc@adhoc:~/Desktop$ cat inst2
6,7p
adhoc@adhoc:~/Desktop$ sed -n -f inst1 -f inst2 emp.lst
2233 | a.k.shukla         | g.m.       | sales      | 12/12/52 | 6000
9876 | jai sharma         | director   | production | 12/03/50 | 7000
5678 | sumit chakrobarty | d.g.m.     | marketing  | 19/04/43 | 6000
2365 | barun sengupta     | director   | personnel  | 11/05/47 | 7800
1006 | chanchal singhvi   | director   | sales      | 03/09/38 | 6700
6213 | karuna ganguly     | g.m.       | accounts   | 05/06/62 | 6300
adhoc@adhoc:~/Desktop$
```

Context Adderssing

Single pattern in all lines of input file

$sed -n '/director/p' emp.lst   **(/SEARCH/)**

Using RE

Select all agrawals

$sed -n '/[aA]gg*[ar][ar]wal/p' emp.lst

More than one

$sed -n '/[aA]gg*[ar][ar]wal/p
        /gupta /p' emp.lst

Wirting selected line to a file(w)

Select / write specifi line (filed) into other file

$sed -n '/director/**w destination_file**' input file

```
adhoc@adhoc:~$ cd Desktop
adhoc@adhoc:~/Desktop$ sed -n '/director/w dist1' emp.lst
adhoc@adhoc:~/Desktop$ cat dist1
9876 | jai sharma        | director | production | 12/03/50 | 7000
2365 | barun sengupta    | director | personnel  | 11/05/47 | 7800
1006 | chanchal singhvi  | director | sales      | 03/09/38 | 6700
6521 | lalit chowduryg*_ | director | marketing  | 26/09/45 | 8200
adhoc@adhoc:~/Desktop$ □
```

Spliting file into more than one file

$sed -n '/director/w dist1

      /manager / w mag1

      /executive /w ext1' emp.lst

Split file **main_file** into two files. 1^{St} (1-500 lines) and 2nd(501 to end)

$sed -n '1,500w file1

 501,$W file2' main_file

Text Editing

Sed can **insert** text and **change** existing text in file

1.Insert & Change lines (i,a,c)

Insert c header files in foo.c file

$sed '1i\

#include<stdio.h>\

#include<conio.h>

' foo.c > $$

Note: need to use \ before [enter]
        except last line. $$ is temp file

Append blank line after every line of file

$sed 'a\

' emp.lst

```
adhoc@adhoc:~/Desktop$ cat foo.c
int main()
{
printf("hi");
return 0;
}
adhoc@adhoc:~/Desktop$ sed '1i\
> #include<stdio.h>\
> #include<conio.h>
> ' foo.c > $$
adhoc@adhoc:~/Desktop$ cat foo.c
int main()
{
printf("hi");
return 0;
}
adhoc@adhoc:~/Desktop$ mv $$ foo.c
adhoc@adhoc:~/Desktop$ cat foo.c
#include<stdio.h>
#include<conio.h>
int main()
{
printf("hi");
return 0;
}
adhoc@adhoc:~/Desktop$ 
```

Text Editing
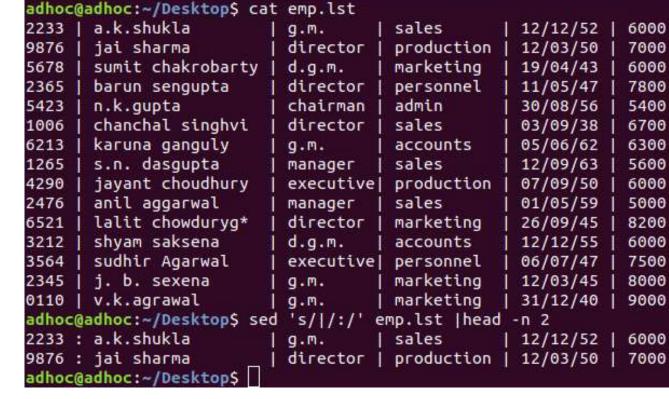
Delete line (d)

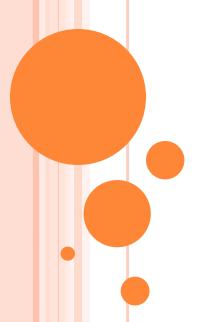Delete all lines except those containg director

$sed '/director/d' emp.lst

```
adhoc@adhoc:~/Desktop$ sed '/director/d' emp.lst
2233 | a.k.shukla        | g.m.      | sales      | 12/12/52 | 6000
5678 | sumit chakrobarty | d.g.m.    | marketing  | 19/04/43 | 6000
5423 | n.k.gupta         | chairman  | admin      | 30/08/56 | 5400
6213 | karuna ganguly    | g.m.      | accounts   | 05/06/62 | 6300
1265 | s.n. dasgupta     | manager   | sales      | 12/09/63 | 5600
4290 | jayant choudhury  | executive | production | 07/09/50 | 6000
2476 | anil aggarwal     | manager   | sales      | 01/05/59 | 5000
3212 | shyam saksena     | d.g.m.    | accounts   | 12/12/55 | 6000
3564 | sudhir Agarwal    | executive | personnel  | 06/07/47 | 7500
2345 | j. b. sexena      | g.m.      | marketing  | 12/03/45 | 8000
0110 | v.k.agrawal       | g.m.      | marketing  | 31/12/40 | 9000
adhoc@adhoc:~/Desktop$ 
```

$sed '/director/d' emp.lst > outlist

Substitution(s)

Substitution(s) [Replace]

Syntax:

      [address] s/exp1/exp2/ flags

$sed 's/|/:/' emp.lst | head -n 2

```
adhoc@adhoc:~/Desktop$ cat emp.lst
2233 | a.k.shukla        | g.m.      | sales      | 12/12/52 | 6000
9876 | jai sharma        | director  | production | 12/03/50 | 7000
5678 | sumit chakrobarty | d.g.m.    | marketing  | 19/04/43 | 6000
2365 | barun sengupta    | director  | personnel  | 11/05/47 | 7800
5423 | n.k.gupta         | chairman  | admin      | 30/08/56 | 5400
1006 | chanchal singhvi  | director  | sales      | 03/09/38 | 6700
6213 | karuna ganguly    | g.m.      | accounts   | 05/06/62 | 6300
1265 | s.n. dasgupta     | manager   | sales      | 12/09/63 | 5600
4290 | jayant choudhury  | executive | production | 07/09/50 | 6000
2476 | anil aggarwal     | manager   | sales      | 01/05/59 | 5000
6521 | lalit chowduryg*  | director  | marketing  | 26/09/45 | 8200
3212 | shyam saksena     | d.g.m.    | accounts   | 12/12/55 | 6000
3564 | sudhir Agarwal    | executive | personnel  | 06/07/47 | 7500
2345 | j. b. sexena      | g.m.      | marketing  | 12/03/45 | 8000
0110 | v.k.agrawal       | g.m.      | marketing  | 31/12/40 | 9000
adhoc@adhoc:~/Desktop$ sed 's/|/:/' emp.lst |head -n 2
2233 : a.k.shukla        | g.m.      | sales      | 12/12/52 | 6000
9876 : jai sharma        | director  | production | 12/03/50 | 7000
adhoc@adhoc:~/Desktop$
```

Substitution(s)

Want to replace all matching : use global(g)

$sed 's/|/:/g' emp.lst

[Replace all | with : of file emp.lst, only print purpose]

```
adhoc@adhoc:~/Desktop$ sed 's/|/:/g' emp.lst
2233 : a.k.shukla        : g.m.     : sales      : 12/12/52 : 6000
9876 : jai sharma        : director : production : 12/03/50 : 7000
5678 : sumit chakrobarty : d.g.m.   : marketing  : 19/04/43 : 6000
2365 : barun sengupta    : director : personnel  : 11/05/47 : 7800
5423 : n.k.gupta         : chairman : admin      : 30/08/56 : 5400
1006 : chanchal singhvi  : director : sales      : 03/09/38 : 6700
6213 : karuna ganguly    : g.m.     : accounts   : 05/06/62 : 6300
1265 : s.n. dasgupta     : manager  : sales      : 12/09/63 : 5600
4290 : jayant choudhury  : executive: production : 07/09/50 : 6000
2476 : anil aggarwal     : manager  : sales      : 01/05/59 : 5000
6521 : lalit chowduryg*  : director : marketing  : 26/09/45 : 8200
3212 : shyam saksena     : d.g.m.   : accounts   : 12/12/55 : 6000
3564 : sudhir Agarwal    : executive: personnel  : 06/07/47 : 7500
2345 : j. b. sexena      : g.m.     : marketing  : 12/03/45 : 8000
0110 : v.k.agrawal       : g.m.     : marketing  : 31/12/40 : 9000
```

We can limit the vertical boundaries vertically too.

$sed '1,3s/|/:/g' emp.lst

```
adhoc@adhoc:~/Desktop$ sed '1,3s/|/:/g' emp.lst
2233 : a.k.shukla        : g.m.     : sales      : 12/12/52 : 6000
9876 : jai sharma        : director : production : 12/03/50 : 7000
5678 : sumit chakrobarty : d.g.m.   : marketing  : 19/04/43 : 6000
2365 | barun sengupta    | director | personnel  | 11/05/47 | 7800
5423 | n.k.gupta         | chairman | admin      | 30/08/56 | 5400
1006 | chanchal singhvi  | director | sales      | 03/09/38 | 6700
6213 | karuna ganguly    | g.m.     | accounts   | 05/06/62 | 6300
1265 | s.n. dasgupta     | manager  | sales      | 12/09/63 | 5600
4290 | jayant choudhury  | executive| production | 07/09/50 | 6000
2476 | anil aggarwal     | manager  | sales      | 01/05/59 | 5000
6521 | lalit chowduryg*  | director | marketing  | 26/09/45 | 8200
3212 | shyam saksena     | d.g.m.   | accounts   | 12/12/55 | 6000
3564 | sudhir Agarwal    | executive| personnel  | 06/07/47 | 7500
2345 | j. b. sexena      | g.m.     | marketing  | 12/03/45 | 8000
0110 | v.k.agrawal       | g.m.     | marketing  | 31/12/40 | 9000
```

Substitution(s)

Word replacement

$sed '1,5s/director/member/' emp.lst


```
adhoc@adhoc:~/Desktop$ sed '1,5s/director/member/g' emp.lst
2233 | a.k.shukla       | g.m.       | sales     | 12/12/52 | 6000
9876 | jai sharma       | member | production | 12/03/50 | 7000
5678 | sumit chakrobarty | d.g.m.     | marketing  | 19/04/43 | 6000
2365 | barun sengupta   | member | personnel  | 11/05/47 | 7800
5423 | n.k.gupta        | chairman | admin     | 30/08/56 | 5400
1006 | chanchal singhvi | director | sales     | 03/09/38 | 6700
6213 | karuna ganguly   | g.m.       | accounts   | 05/06/62 | 6300
1265 | s.n. dasgupta    | manager  | sales     | 12/09/63 | 5600
4290 | jayant choudhury | executive| production | 07/09/50 | 6000
2476 | anil aggarwal    | manager  | sales     | 01/05/59 | 5000
6521 | lalit chowduryg* | director | marketing  | 26/09/45 | 8200
3212 | shyam saksena    | d.g.m.     | accounts   | 12/12/55 | 6000
3564 | sudhir Agarwal   | executive| personnel  | 06/07/47 | 7500
2345 | j. b. sexena     | g.m.       | marketing  | 12/03/45 | 8000
0110 | v.k.agrawal      | g.m.       | marketing  | 31/12/40 | 9000
adhoc@adhoc:~/Desktop$
```

Relacement by RE

$sed 's/[Aa]gg*[ar][ar]wal/Agarwal/g' emp.lst

[Replace all types of agrawal with Agarwal]

Substitution(s)

Add **Prefix**/Begining (^)

$sed 's/^/2/' emp.lst

[add 2 to every line of file emp.lst]

```
adhoc@adhoc:~/Desktop$ sed 's/^/2/' emp.lst
22233 | a.k.shukla          | g.m.      | sales       | 12/12/52 | 6000
29876 | jai sharma          | director  | production  | 12/03/50 | 7000
25678 | sumit chakrobarty   | d.g.m.    | marketing   | 19/04/43 | 6000
22365 | barun sengupta      | director  | personnel   | 11/05/47 | 7800
25423 | n.k.gupta           | chairman  | admin       | 30/08/56 | 5400
21006 | chanchal singhvi    | director  | sales       | 03/09/38 | 6700
26213 | karuna ganguly      | g.m.      | accounts    | 05/06/62 | 6300
21265 | s.n. dasgupta       | manager   | sales       | 12/09/63 | 5600
24290 | jayant choudhury    | executive | production  | 07/09/50 | 6000
22476 | anil aggarwal       | manager   | sales       | 01/05/59 | 5000
26521 | lalit chowduryg*    | director  | marketing   | 26/09/45 | 8200
23212 | shyam saksena       | d.g.m.    | accounts    | 12/12/55 | 6000
23564 | sudhir Agarwal      | executive | personnel   | 06/07/47 | 7500
22345 | j. b. sexena        | g.m.      | marketing   | 12/03/45 | 8000
20110 | v.k.agrawal         | g.m.      | marketing   | 31/12/40 | 9000
adhoc@adhoc:~/Desktop$ sed 's/^/2/' emp.lst
```

Add **Suffix**/End ($)

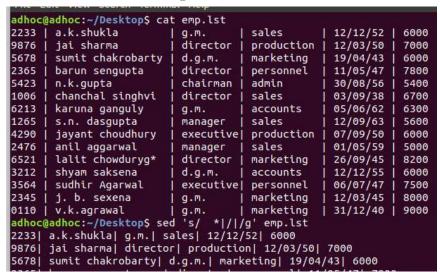$sed 's/$/.00' emp.lst

```
adhoc@adhoc:~/Desktop$ sed 's/$/.00/' emp.lst
2233 | a.k.shukla          | g.m.      | sales       | 12/12/52 | 6000.00
9876 | jai sharma          | director  | production  | 12/03/50 | 7000.00
5678 | sumit chakrobarty   | d.g.m.    | marketing   | 19/04/43 | 6000.00
2365 | barun sengupta      | director  | personnel   | 11/05/47 | 7800.00
5423 | n.k.gupta           | chairman  | admin       | 30/08/56 | 5400.00
1006 | chanchal singhvi    | director  | sales       | 03/09/38 | 6700.00
6213 | karuna ganguly      | g.m.      | accounts    | 05/06/62 | 6300.00
1265 | s.n. dasgupta       | manager   | sales       | 12/09/63 | 5600.00
4290 | jayant choudhury    | executive | production  | 07/09/50 | 6000.00
2476 | anil aggarwal       | manager   | sales       | 01/05/59 | 5000.00
6521 | lalit chowduryg*    | director  | marketing   | 26/09/45 | 8200.00
3212 | shyam saksena       | d.g.m.    | accounts    | 12/12/55 | 6000.00
3564 | sudhir Agarwal      | executive | personnel   | 06/07/47 | 7500.00
2345 | j. b. sexena        | g.m.      | marketing   | 12/03/45 | 8000.00
0110 | v.k.agrawal         | g.m.      | marketing   | 31/12/40 | 9000.00
```

Substitution(s)

Multiple Substitution

$sed 's/director/doctor/g

>s/manager/seniormanager/g' emp.lst

Compressing multiple spaces (Remove extra space)

$sed 's/ *|/|/g' emp.lst

Substitution(s) with RE

1. Repeated Pattern (&)

$sed 's/director/executive **director**/' emp.lst

$sed 's/director/executive **$**/' emp.lst

Note:// means Rembers the scanned patterns

$sed '/director/s//executive **$**/' emp.lst

```
adhoc@adhoc:~/Desktop$ sed 's/director/eective director/' emp.lst
2233 | a.k.shukla       | g.m.      | sales      | 12/12/52 | 6000
9876 | jai sharma       | eective director | production | 12/03/50 | 7000
5678 | sumit chakrobarty | d.g.m.    | marketing  | 19/04/43 | 6000
2365 | barun sengupta   | eective director | personnel | 11/05/47 | 7800
```

```
0110 | v.k.agrawal      | g.m.      | marketing  | 31/12/40 | 9000
adhoc@adhoc:~/Desktop$ sed 's/director/eective &/' emp.lst
2233 | a.k.shukla       | g.m.      | sales      | 12/12/52 | 6000
9876 | jai sharma       | eective director | production | 12/03/50 | 7000
5678 | sumit chakrobarty | d.g.m.    | marketing  | 19/04/43 | 6000
2365 | barun sengupta   | eective director | personnel | 11/05/47 | 7800
```

```
0110 | v.k.agrawal      | g.m.      | marketing  | 31/12/40 | 9000
adhoc@adhoc:~/Desktop$ sed '/director/s//eective &/' emp.lst
2233 | a.k.shukla       | g.m.      | sales      | 12/12/52 | 6000
9876 | jai sharma       | eective director | production | 12/03/50 | 7000
5678 | sumit chakrobarty | d.g.m.    | marketing  | 19/04/43 | 6000
2365 | barun sengupta   | eective director | personnel | 11/05/47 | 7800
5432 | n.k.gupta        | chairman  | admin      | 30/08/56 | 5400
```