

# Regular Expression

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# What are regular expressions?

- A regular expression is a pattern that describes a set of strings.
- Regular expressions are used to search and manipulate the text, based on the patterns.
- A regular expression, often shortened to “regex” or “regexp”.
- Regexes enhance the ability to meaningfully process text content, especially when combined with other commands.

# grep ,sed,awk

- Usually, regular expressions are included in the grep,sed and awk in the following format:
- grep [options] **[regexp]** [infile]
- In sed : sed [option] '/**[regexp]**action/' [infile]
- In awk: awk [option] '/**[regexp]**{Action}' [infile]

# BRE & ERE

- Two types of regular expression feature in unix/Linux shell
- Basic Regular Expression – BRE
- Extended Regular Expression – ERE

# BRE

- BRE – following meta characters are used
- . (dot) Matches any single character.
- ^ match expression at the start of a line, as ^PATTERN
- \$ match expression at the end of a line, as in PATTERN\$.
- \ (Back Slash) = turn off the special meaning of the next character, as in \^
- [ ] (Brackets)=match any one of the enclosed characters
- [^ ]= match any one character **except** those enclosed in [ ]
- \* (Asterisk) = match zero or more of the preceding character or expression
- ^PATTERN\$ = match PATTERN only in single line
- [-]=Character ranges as [A-Z] [0-9] [a-z] [A-Za-z0-9]

# ERE

- ERE – Following meta characters are used.
- ? means that the preceding item is optional, and if found, will be matched at the most, once.
- + means the preceding item will be matched one or more times.
- {n} means the preceding item is matched exactly n times
- {n,} means the item is matched n or more times.
- {n,m} means that the preceding item is matched at least n times, but not more than m times.
- {,m} means that the preceding item is matched, at the most, m times.
- | (alternation) operator means that the pattern containing this operator separately matches the parts on either side of it; if either one is found, the line containing it is a match.
- ( ) Grouping means that ( ) to group several patterns to behave as one.

# ERE

- In general ERE supports following operations
  - Alternative Match Patterns
  - Grouping Alternatives
  - Quantifiers

# Alternative Match Patterns

- Alternative Match Pattern means that you can specify a series of alternatives for a pattern using | to separate them.
- |(called alternation) is equivalent to an “or” in regular expression.
- Alternatives are checked from left to right, so the first alternative that matches is the one that's used.

# Grouping Alternatives

- Grouping “( ) “ allows parts of a regular expression to be treated as a single unit.
- Parts of a regular expression are grouped by enclosing them in parentheses.
- Used to group similar terms by their common characters and only specified the differences.
- The pairs of parentheses are numbered from left to right by the positions of the left parentheses.

# Quantifiers

- Quantifiers says how many times something may match, instead of the default of matching just once.
- You can use quantifier to specify that a pattern must match a specific number of times.
- Quantifiers in a regular expression are like loops in a program.

# Quantifiers (Contd..)

character	Description
* match 0 or more times	<p>It indicates that the string Immediately to the left should be matched zero or more times in order to be evaluated as a true.</p> <p>Example:-</p> <p>\$var =~ /st*/ # Will match for the strings like “st”, “sttr”, “ sts ”, “star”, “son “....</p> <p>The regexp “a*” will search for a followed by either “a” or any other character.</p> <p>It matches all strings which contain the character “a”</p>

# Quantifiers (Contd..)

character	Description
+ match 1 or more times	<p>It indicates that the string Immediately to the left should be matched one or more times in order to be evaluated as a true.</p> <p>Example:-</p> <p>\$var =~ /st+/ # Will match for the strings like "st", "str", "sts", "star ", but not "son".</p>

# Quantifiers (Contd..)

character	Description
?	<p>It indicates that the string Immediately to the left should be matched zero or one times in order to be evaluated as a true.</p> <p>Example : -</p> <p>\$var =~ /st?r/ # will match either “star” or “Sttr”.</p>
match 1 or 0 times	<p>\$var =~ /comm?a/ # will match either “coma” or “comma”</p>

# Quantifiers (Contd..)

character	Description
{ }	<p>It indicates that how many times the string immediately to the left should be matched.</p> <p>Example : -</p> <p>{n} - should match exactly n times. {n,} - should match at least n times {n, m} - Should match at least n times but not more than m times.</p> <p>Example :</p> <p>\$var =~ /mn{2,4}p/ # will match “mnnp”, “mnnnp”, “mnnnnp” .</p>

# Making Quantifiers Less Greedy

- To make Quantifiers less greedy –that is ,to match the minimum number of times possible –you follow the quantifier with a ?
- \*? Matches zero or more times.
- +? Matches one or more times.
- ?? Matches zero or one times.
- {n}? Matches n times.
- {n,}? Matches at least n times
- {m,n} Matches at least n times but more than m times.

# BRE vs ERE

- In basic regular expressions the metacharacters "?", "+", "{", "|", "(", and ")" lose their special meaning; instead use the backslashed versions "\?", "\+", "\{", "\|", "\(", and "\)".
- In ERE options
- grep -E
- sed -r

# Examples using grep

- we now exclusively want to display lines starting with the string "root":  
`grep ^root /etc/passwd`
- `root:x:0:0:root:/bin/bash`
- If we want to see which accounts have no shell assigned whatsoever, we search for lines ending in ":"  
`grep :$ /etc/passwd`
- `news:x:9:13:news:/var/spool/news:`

# Character classes

- grep [yf] /etc/group
- sys:x:3:root,bin,adm
- tty:x:5:
- mail:x:12:mail,postfix
- ftp:x:50:
- nobody:x:99:
- floppy:x:19:
- xfs:x:43:
- nfsnobody:x:65534:
- postfix:x:89:
-

- dog matches the string "dog"
- [dog]matches matches one character: a "d" an "o" or a "g"
- [dog]\* matches matches a string of zero or more characters from the set {"d" an "o" or a "g"}
- (dog|cat) matches the string "dog" or the string "cat"
- dog.\*cat matches the string "dog" followed by the string "cat" somewhere later in the string
- x(dog|cat)x matches the string "dog" or the string "cat" between two "x"s
- xx\* matches a string of one or more "x"s
- x+matches a string of one or more "x"s
- x(dog|cat)?x matches two "x"s with optionally the string "dog" or the string "cat" between the "x"s
- [aeiou] matches a single vowel
- [A-Z]+ matches a string of one or more uppercase characters
- [az-]+ matches a string of one characters from the set or three characters "a", "z", "-"
- [^a-z]+ matches a string of one or more characters that are not lowercaase letters
- "[a-z]" in flex matches exactly the five character string "[a-z]"
- [a-zA-Z][a-zA-Z0-9]\*matches a letter optionally followed by letters or digits
- [1-9][0-9]\*|0 matches a positive integer with no leading zero except when the number is zero
- [+]?[0-9]+ matches an integer with optional sign (note that leading zeroes are allowed)
- ([0-9].)\*matches an even number of characters where every odd numbered character is a digit
- [+]?[1-9][0-9]\*|0 matches an integer with no leading zero except when the number is zero. The number may have an optional sign
- [^\+\\-\\.\\\*\\]] matches one of the 6 characters: "^", "+", "-", ".", "\*", "]"

# Regx Snaps



File Edit View Search Terminal Help

[Karthikeyan@Host1 ~]\$ cat -n emp.db ## This is Sample input file

```
1 ram,sales,pune,10000
2 kumar,prod,pune,20000
3 shan,sales,bglore,24555
4 ashok,prod,chennai,12465
5 xerox,sales,bglore,34500
6 babu,HR,chennai,12900
7 vikas,hr,pune,34590
8 karthik,sales,bglore,34987
9 anu,hr,delhi,29954
10 zion,prod,bglore,13459
11 vikas,sales,pune,20000
```

[Karthikeyan@Host1 ~]\$

Karthikeyan@Host1:~

Karthikeyan@Host1:~

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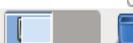
[Karthikeyan@Host1 ~]\$ grep -n ^s emp.db # Line start with s character

3:shan,sales,bglore,24555

[Karthikeyan@Host1 ~]\$

Karthikeyan@Host1:~

Karthikeyan@Host1:~



Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ cat -n emp.db ## This is Sample input file
1 ram,sales,pune,10000
2 kumar,prod,pune,20000
3 shan,sales,bglore,24555
4 ashok,prod,chennai,12465
5 xerox,sales,bglore,34500
6 babu,HR,chennai,12900
7 vikas,hr,pune,34590
8 karthik,sales,bglore,34987
9 anu,hr,delhi,29954
10 zion,prod,bglore,13459
11 vikas,sales,pune,20000
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ grep -n ^s emp.db # Line start with s character
3:shan,sales,bglore,24555
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n ^a emp.db # Line start with a character
4:ashok,prod,chennai,12465
9:anu,hr,delhi,29954
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n emp.db ## This is Sample input file
1 ram,sales,pune,10000
2 kumar,prod,pune,20000
3 shan,sales,bglore,24555
4 ashok,prod,chennai,12465
5 xerox,sales,bglore,34500
6 babu,HR,chennai,12900
7 vikas,hr,pune,34590
8 karthik,sales,bglore,34987
9 anu,hr,delhi,29954
10 zion,prod,bglore,13459
11 vikas,sales,pune,20000
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^s emp.db # Line start with s character
3:shan,sales,bglore,24555
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n ^a emp.db # Line start with a character
4:ashok,prod,chennai,12465
9:anu,hr,delhi,29954
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n ^anu emp.db # Line starts with anu
9:anu,hr,delhi,29954
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n emp.db ## This is Sample input file
1 ram,sales,pune,10000
2 kumar,prod,pune,20000
3 shan,sales,bglore,24555
4 ashok,prod,chennai,12465
5 xerox,sales,bglore,34500
6 babu,HR,chennai,12900
7 vikas,hr,pune,34590
8 karthik,sales,bglore,34987
9 anu,hr,delhi,29954
10 zion,prod,bglore,13459
11 vikas,sales,pune,20000
[Karthikeyan@Host1 ~]$
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ grep -n 00$ emp.db ## Line end with 00
1:ram,sales,pune,10000
2:kumar,prod,pune,20000
5:xerox,sales,bglore,34500
6:babu,HR,chennai,12900
11:vikas,sales,pune,20000
[Karthikeyan@Host1 ~]$
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n emp.db ## This is Sample input file
1 ram,sales,pune,10000
2 kumar,prod,pune,20000
3 shan,sales,bglore,24555
4 ashok,prod,chennai,12465
5 xerox,sales,bglore,34500
6 babu,HR,chennai,12900
7 vikas,hr,pune,34590
8 karthik,sales,bglore,34987
9 anu,hr,delhi,29954
10 zion,prod,bglore,13459
11 vikas,sales,pune,20000
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n 00$ emp.db ## Line end with 00
1:ram,sales,pune,10000
2:kumar,prod,pune,20000
5:xerox,sales,bglore,34500
6:babu,HR,chennai,12900
11:vikas,sales,pune,20000
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n 5$ emp.db ## Line end with 5
3:shan,sales,bglore,24555
4:ashok,prod,chennai,12465
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file
1 unix essentials
2 UNIX concepts
3 Linux shell scripts
4 linux essentials
5 unixAnos
6 unix os concepts
7 System standard IPCs
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ grep -n ^unix.* Input1 ## Line starts with unix List of all
1:unix essentials
5:unixAnos
6:unix os concepts
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ [พระขันทกุมาร Potri 10...]

Applications Places System 81 °F Fri Dec 18, 02:15:44 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file
1 unix essentials
2 UNIX concepts
3 Linux shell scripts
4 linux essentials
5 unixAnos
6 unix os concepts
7 System standard IPCs
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^unix.* Input1 ## Line starts with unix List of all
1:unix essentials
5:unixAnos
6:unix os concepts
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -n ^unix.*$ Input1 ## Line starts with unix end with s char
1:unix essentials
5:unixAnos
6:unix os concepts
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกมรา Pottri 10...

Applications Places System 81 °F Fri Dec 18, 02:17:31 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file
1 unix essentials
2 UNIX concepts
3 Linux shell scripts
4 linux essentials
5 unixAnos
6 unix os concepts
7 System standard IPCs
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^U.* Input1 # Line start with U char
2:UNIX concepts
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระบันทกมรา Pottri 10...

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file
1 unix essentials
2 UNIX concepts
3 Linux shell scripts
4 linux essentials
5 unixAnos
6 unix os concepts
7 System standard IPCs
[Karthikeyan@Host1 ~]$
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ grep -n ^[uU].* Input1 ## Line start with u or U followed list of all
1:unix essentials
2:UNIX concepts
5:unixAnos
6:unix os concepts
[Karthikeyan@Host1 ~]$
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกุมาร Pottri 10...

Applications Places System 81 °F Fri Dec 18, 02:23:04 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file
1 unix essentials
2 unix os
3 UNIX concepts
4 Linux shell scripts
5 linux essentials
6 unixAnos
7 unixaos
8 Unix os
9 unix os concepts
10 System standard_IPCs
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^unix.os$ Input1 ## Line starts with unix followed by any single char end with os
2:unix os
7:unixaos
[Karthikeyan@Host1 ~]$ ## Note it wont display 8th line coz line starts with Unix
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกุมาร Pottri 10...

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file  
1 unix essentials  
2 unix os  
3 UNIX concepts  
4 Linux shell scripts  
5 linux essentials  
6 unixAnos  
7 unixaos  
8 Unix os  
9 unix os concepts  
10 System standard_IPCs
```

```
File Edit View Search Terminal Help  
[Karthikeyan@Host1 ~]$ grep -n ^unix.os$ Input1 ## Line starts with unix followed by any single char end with os  
2:unix os  
7:unixaos  
[Karthikeyan@Host1 ~]$ ## Note it wont display 8th line coz line starts with Unix  
[Karthikeyan@Host1 ~]$ grep -n ^unix..os$ Input1 ## Line starts with unix followed by any two chars end with os  
6:unixAnos  
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

Karthikeyan@Host1:~

[พระขันทกุมาร Pottri 10...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file
1 unix essentials
2 unix os
3 UNIX concepts
4 Linux shell scripts
5 linux essentials
6 unixAnos
7 unixaos
8 Unix os
9 unix os concepts
10 System standard IPCs
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ # How to print 9th line ? unix os concepts
[Karthikeyan@Host1 ~]$
```

Karthikeyan@Host1:~

พระอันนทกมาร Pottri 10...

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file
1 unix essentials
2 unix os
3 UNIX concepts
4 Linux shell scripts
5 linux essentials
6 unixAnos
7 unixaos
8 Unix os
9 unix os concepts
10 System standard_IPCs
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ # How to print 9th line ? unix os concepts
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n ^unix.* Input1
1:unix essentials
2:unix os
6:unixAnos
7:unixaos
9:unix os concepts
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกมรา Pottri 10...

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ cat -n Input1 ## This is Sample Input file
1 unix essentials
2 unix os
3 UNIX concepts
4 Linux shell scripts
5 linux essentials
6 unixAnos
7 unixaos
8 Unix os
9 unix os concepts
10 System standard_IPCs
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ # How to print 9th line ? unix os concepts
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n ^unix.* Input1
1:unix essentials
2:unix os
6:unixAnos
7:unixaos
9:unix os concepts
[Karthikeyan@Host1 ~]$ grep -n ^unix.*.concepts$ Input1
9:unix os concepts
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกมรา Pottri 10...

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ ## Display list of directories
[Karthikeyan@Host1 ~]$ ls -l
total 328
drwxrwxr-x. 2 Karthikeyan Karthikeyan 4096 Dec 11 11:07 Admin
-rw-rw-r--. 1 Karthikeyan Karthikeyan 30720 Dec 17 04:35 Admin.tar
drwxrwxr-x. 5 Karthikeyan Karthikeyan 4096 Dec 4 11:56 Assignments
        109 Dec 5 19:36 CGI_URL
20481 Dec 17 21:12 DB.tar
        4096 Dec 18 02:27 Desktop
        4096 Dec 16 04:38 Documents
        4096 Dec 17 05:19 Downloads
        251 Dec 18 02:03 emp.db
        138 Dec 18 02:21 Input1
        297 Dec 15 01:44 mail_Shells
4096 Nov 29 05:43 MH
4096 Nov 29 06:40 Music
4096 Dec 12 10:41 Pictures
4096 Nov 29 06:40 Public
4096 Dec 10 14:11 Python
1065 Dec 17 05:07 Ref_17
        328 Dec 17 04:59 report.html
140124 Dec 17 04:40 sent
        4096 Dec 11 09:48 Shell
        80 Nov 29 15:27 signal.pl
        142 Nov 29 15:39 stack.pl
1179 Dec 17 04:42 sysinfo.sh
4096 Nov 29 06:40 Templates
        2123 Dec 12 15:16 Thirupugzal
        2120 Dec 11 13:11 Thirupugzal~
4096 Dec 17 04:34 TT
30720 Dec 13 14:50 TT.tar
        4096 Dec 12 10:41 Videos
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ ls -l|grep ^d
drwxrwxr-x. 2 Karthikeyan Karthikeyan 4096 Dec 11 11:07 Admin
drwxrwxr-x. 5 Karthikeyan Karthikeyan 4096 Dec 4 11:56 Assignments
drwxr-xr-x. 2 Karthikeyan Karthikeyan 4096 Dec 18 02:27 Desktop
drwxr-xr-x. 4 Karthikeyan Karthikeyan 4096 Dec 16 04:38 Documents
drwxr-xr-x. 5 Karthikeyan Karthikeyan 4096 Dec 17 05:19 Downloads
drwxr-xr-x. 7 root      root      4096 Nov 29 05:43 MH
drwxr-xr-x. 2 Karthikeyan Karthikeyan 4096 Nov 29 06:40 Music
drwxr-xr-x. 3 Karthikeyan Karthikeyan 4096 Dec 12 10:41 Pictures
drwxr-xr-x. 2 Karthikeyan Karthikeyan 4096 Nov 29 06:40 Public
drwxrwxr-x. 7 Karthikeyan Karthikeyan 4096 Dec 10 14:11 Python
drwxr-xr-x. 2 Karthikeyan Karthikeyan 1065 Dec 17 05:07 Ref_17
drwxr-xr-x. 3 Karthikeyan Karthikeyan 328 Dec 17 04:59 report.html
drwxr-xr-x. 3 Karthikeyan Karthikeyan 140124 Dec 17 04:40 sent
drwxrwxr-x. 3 Karthikeyan Karthikeyan 4096 Dec 11 09:48 Shell
drwxr-xr-x. 1 Karthikeyan Karthikeyan 80 Nov 29 15:27 signal.pl
drwxr-xr-x. 1 Karthikeyan Karthikeyan 142 Nov 29 15:39 stack.pl
drwxr-xr-x. 1 root      root      1179 Dec 17 04:42 sysinfo.sh
drwxr-xr-x. 2 Karthikeyan Karthikeyan 4096 Nov 29 06:40 Templates
drwxr-xr-x. 1 Karthikeyan Karthikeyan 2123 Dec 12 15:16 Thirupugzal
drwxr-xr-x. 1 Karthikeyan Karthikeyan 2120 Dec 11 13:11 Thirupugzal~
drwxrwxr-x. 3 Karthikeyan Karthikeyan 4096 Dec 17 04:34 TT
drwxr-xr-x. 3 Karthikeyan Karthikeyan 30720 Dec 13 14:50 TT.tar
drwxr-xr-x. 3 Karthikeyan Karthikeyan 4096 Dec 12 10:41 Videos
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ ls -l|grep ^d|wc -l
14
[Karthikeyan@Host1 ~]$ 
```

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
2605 ? 00:00:01 nautilus  
2607 ? 00:00:00 bonobo-activati  
2614 ? 00:00:01 wnck-applet  
2615 ? 00:00:00 trashapplet  
2620 ? 00:00:00 gvfsd-trash  
2622 ? 00:00:00 gvfs-gdu-volume  
2624 ? 00:00:00 udisks-daemon  
2625 ? 00:00:00 udisks-daemon  
2630 ? 00:00:00 gnome-volume-co  
2635 ? 00:00:00 gvfs-gphoto2-vo  
2637 ? 00:00:00 im-settings-dae  
2644 ? 00:00:00 restorecond  
2681 ? 00:00:00 gvfs-afc-volume  
2718 ? 00:00:00 evolution-alarm  
2719 ? 00:00:00 nm-applet  
2766 ? 00:00:00 python  
2804 ? 00:00:00 gconf-im-settin  
2805 ? 00:00:00 gnome-power-man  
2806 ? 00:00:00 abrt-applet  
2808 ? 00:00:00 gpk-update-icon  
2814 ? 00:00:00 gdu-notificatio  
2817 ? 00:00:00 bluetooth-apple  
2818 ? 00:00:00 polkit-gnome-au  
2820 ? 00:00:00 gnome-screensav  
2824 ? 00:00:00 gnote  
2830 ? 00:00:00 gdm-user-switch  
2832 ? 00:00:00 notification-ar  
2833 ? 00:00:02 clock-applet  
2851 ? 00:00:00 gvfsd-metadata  
2853 ? 00:00:00 gvfsd-burn  
3891 ? 00:00:03 gnome-terminal  
3893 ? 00:00:00 gnome-pty-helpe  
3894 pts/0 00:00:00 bash  
3954 pts/1 00:00:00 bash  
4101 ? 00:00:51 vlc  
4168 ? 00:00:00 xdg-screensaver  
4176 ? 00:00:00 xdg-screensaver  
4180 ? 00:00:00 xprop  
4409 ? 00:00:00 sleep  
4429 pts/0 00:00:00 ps
```

[Karthikeyan@Host1 ~]\$

Karthikeyan@Host1:~

Karthikeyan@Host1:~

พระอันนทกมรา Pottri 10...

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ # list of process names end with d  
[Karthikeyan@Host1 ~]$  
[Karthikeyan@Host1 ~]$ ps -e|grep d$
```

Karthikeyan@Host1:~

```
File Edit View Search Terminal Help
2605 ? 00:00:01 nautilus
2607 ? 00:00:00 bonobo-activati
2614 ? 00:00:01 wnck-applet
2615 ? 00:00:00 trashapplet
2620 ? 00:00:00 gvfsd-trash
2622 ? 00:00:00 gvfs-gdu-volume
2624 ? 00:00:00 udisks-daemon
2625 ? 00:00:00 udisks-daemon
2630 ? 00:00:00 gnome-volume-co
2635 ? 00:00:00 gvfs-gphoto2-vo
2637 ? 00:00:00 im-settings-dae
2644 ? 00:00:00 restorecond
2681 ? 00:00:00 gvfs-afc-volume
2718 ? 00:00:00 evolution-alarm
2719 ? 00:00:00 nm-applet
2766 ? 00:00:00 python
2804 ? 00:00:00 gconf-im-settin
2805 ? 00:00:00 gnome-power-man
2806 ? 00:00:00 abrt-applet
2808 ? 00:00:00 gpk-update-icon
2814 ? 00:00:00 gdu-notificatio
2817 ? 00:00:00 bluetooth-apple
2818 ? 00:00:00 polkit-gnome-au
2820 ? 00:00:00 gnome-screensav
2824 ? 00:00:00 gnote
2830 ? 00:00:00 gdm-user-switch
2832 ? 00:00:00 notification-ar
2833 ? 00:00:02 clock-applet
2851 ? 00:00:00 gvfsd-metadata
2853 ? 00:00:00 gvfsd-burn
3891 ? 00:00:03 gnome-terminal
3893 ? 00:00:00 gnome-pty-helpe
3894 pts/0 00:00:00 bash
3954 pts/1 00:00:00 bash
4101 ? 00:00:51 vlc
4168 ? 00:00:00 xdg-screensaver
4176 ? 00:00:00 xdg-screensaver
4180 ? 00:00:00 xprop
4409 ? 00:00:00 sleep
4429 pts/0 00:00:00 ps
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

```
File Edit View Search Terminal Help
[Karthikeyan@Host1 ~]$ # list of process names end with d
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ #ps -e|grep d$ 
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ ps -e|grep d$|wc -l
29
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกุมาร Pottri 10...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input2 ## Input file
1 root:x:0:0:root:/bin/bash
2 bin:x:1:1:bin:/bin:/sbin/nologin
3 daemon:x:2:2:daemon:/sbin:/sbin/nologin
4
5 adm:x:3:4:adm:/var/adm:/sbin/nologin
6 lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
7 sync:x:5:0:sync:/sbin:/bin/sync
8
9 shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
10 halt:x:7:0:halt:/sbin:/sbin/halt
11 login
12 uucp:x:10:14:uucp:/var/spool/uucp:/sbin/nologin
13
14 operator:x:11:0:operator:/root:/sbin/nologin
15 games:x:12:100:games:/usr/games:/sbin/nologin
16
17 gopher:x:13:30:gopher:/var/gopher:/sbin/nologin
[Karthikeyan@Host1 ~]$
```

File Edit View Search Terminal Help

Karthikeyan@Host1:~\$ ## Display List of empty lines

Karthikeyan@Host1 ~\$

Karthikeyan@Host1 ~\$ grep -n ^\$ Input2

4:

8:

13:

16:

[Karthikeyan@Host1 ~]\$

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกมรา Pottri 10...



81 °F Fri Dec 18, 02:33:21 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input2 ## Input file
1 root:x:0:0:root:/bin/bash
2 bin:x:1:1:bin:/bin:/sbin/nologin
3 daemon:x:2:2:daemon:/sbin:/sbin/nologin
4
5 adm:x:3:4:adm:/var/adm:/sbin/nologin
6 lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
7 sync:x:5:0:sync:/sbin:/bin.sync
8
9 shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
10 halt:x:7:0:halt:/sbin:/sbin/halt
11 login
12 uucp:x:10:14:uucp:/var/spool/uucp:/sbin/nologin
13
14 operator:x:11:0:operator:/root:/sbin/nologin
15 games:x:12:100:games:/usr/games:/sbin/nologin
16
17 gopher:x:13:30:gopher:/var/gopher:/sbin/nologin
[Karthikeyan@Host1 ~]$ 
```

```
File Edit View Search Terminal Help
Karthikeyan@Host1:~$ ## Display List of empty lines
[Karthikeyan@Host1 ~]$ grep -n ^$ Input2
4:
8:
13:
16:
[Karthikeyan@Host1 ~]$ ## Display Non-Empty lines
[Karthikeyan@Host1 ~]$ grep -nv ^$ Input2
1:root:x:0:0:root:/root:/bin/bash
2:bin:x:1:1:bin:/bin:/sbin/nologin
3:daemon:x:2:2:daemon:/sbin:/sbin/nologin
5:adm:x:3:4:adm:/var/adm:/sbin/nologin
6:lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
7:sync:x:5:0:sync:/sbin:/bin.sync
9:shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
10:halt:x:7:0:halt:/sbin:/sbin/halt
11:login
12:uucp:x:10:14:uucp:/var/spool/uucp:/sbin/nologin
14:operator:x:11:0:operator:/root:/sbin/nologin
15:games:x:12:100:games:/usr/games:/sbin/nologin
17:gopher:x:13:30:gopher:/var/gopher:/sbin/nologin
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

Karthikeyan@Host1:~

พระอันนทกุมาร Potri 10...

Applications Places System 81 °F Fri Dec 18, 02:35:13 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input3
1 root:x:0:0:root:/bin/bash
2 bin:x:1:1:bin:/bin:/sbin/nologin
3 daemon:x:2:2:daemon:/sbin:/sbin/nologin
4 adm:x:3:4:adm:/var/adm:/sbin/nologin
5 Root:x:1:Root:/bin/bash
6 lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
7 sync:x:5:0:sync:/sbin:/bin/sync
8 shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
9 halt:x:7:0:halt:/sbin:/sbin/halt
10 login
11 gopher:x:13:30:gopher:/var/gopher:/sbin/nologin
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -n ^[rR].*bash$ Input3
1:root:x:0:0:root:/bin/bash
5:Root:x:1:Root:/bin/bash
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกมรา Pottri 10...

Applications Places System 81 °F Fri Dec 18, 02:39:19 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input4
1 Ram kumar shiv:sales
2 karthik ram kumar:prod
3 kumar Ram karthik:sales
4 ram Kumar:sales
5 anil kumar:HR
6 RAM kumar Shiv:prod
7 shiv kumar ram:prod
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^Ram.[kK]umar.* Input4
1:Ram kumar shiv:sales
[Karthikeyan@Host1 ~]$ 
```

Applications Places System 81 °F Fri Dec 18, 02:39:52 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input4
1 Ram kumar shiv:sales
2 karthik ram kumar:prod
3 kumar Ram karthik:sales
4 ram Kumar:sales
5 anil kumar:HR
6 RAM kumar Shiv:prod
7 shiv kumar ram:prod
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^Ram.[kK]umar.* Input4
1:Ram kumar shiv:sales
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n ^[Rr]am.[kK]umar.* Input4
1:Ram kumar shiv:sales
4:ram Kumar:sales
[Karthikeyan@Host1 ~]$ 
```

Applications Places System 81 °F Fri Dec 18, 02:40:23 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input4
1 Ram kumar shiv:sales
2 karthik ram kumar:prod
3 kumar Ram karthik:sales
4 ram Kumar:sales
5 anil kumar:HR
6 RAM kumar Shiv:prod
7 shiv kumar ram:prod
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^Ram.[kK]umar.* Input4
1:Ram kumar shiv:sales
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n ^[Rr]am.[kK]umar.* Input4
1:Ram kumar shiv:sales
4:ram Kumar:sales
[Karthikeyan@Host1 ~]$ grep -n ^[Rr][Aa]m.[kK]umar.* Input4
1:Ram kumar shiv:sales
4:ram Kumar:sales
[Karthikeyan@Host1 ~]$ grep -n ^[Rr][Aa][Mm].[kK]umar.* Input4
1:Ram kumar shiv:sales
4:ram Kumar:sales
6:RAM kumar Shiv:prod
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระชั้นทกมรา Pottri 10...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat >Input5
UNIXCONTENTS

file
process
MEMORY
DeviceDrivers
Device Control

IPC Concepts
System V standards
posix 1003 stds
12345
#####
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^[A-Z] Input5 ## Line start with any upper case chars
1:UNIXCONTENTS
5:MEMORY
6:DeviceDrivers
7:Device Control
9:IPC Concepts
10:System V standards
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

พระอันนกมาร Pottri 10...

Applications Places System 81 °F Fri Dec 18, 02:48:06 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat >Input5
UNIXCONTENTS

file
process
MEMORY
DeviceDrivers
Device Control

IPC Concepts
System V standards
posix 1003 stds
12345
#####
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^[A-Z] Input5 ## Line start with any upper case chars
1:UNIXCONTENTS
5:MEMORY
6:DeviceDrivers
7:Device Control
9:IPC Concepts
10:System V standards
[Karthikeyan@Host1 ~]$ grep -n ^[a-z] Input5 ## Line start with any lower case chars
3:file
4:process
11:posix 1003 stds
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ พระอันนทกมรา Pottri 10...

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ cat >Input5
UNIXCONTENTS
file
process
MEMORY
DeviceDrivers
Device Control
IPC Concepts
System V standards
posix 1003 stds
12345
#####
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ grep -n ^[A-Z] Input5 ## Line start with any upper case chars
1:UNIXCONTENTS
5:MEMORY
6:DeviceDrivers
7:Device Control
9:IPC Concepts
10:System V standards
[Karthikeyan@Host1 ~]$ grep -n ^[^A-Z] Input5 ## Line NOT START WITH UPPER CASE chars
3:file
4:process
11:posix 1003 stds
12:12345
13:#####
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ cat >Input5
UNIXCONTENTS

file
process
MEMORY
DeviceDrivers
Device Control

IPC Concepts
System V standards
posix 1003 stds
12345
#####
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ grep -n ^[A-Z] Input5 ## Line start with any upper case chars
1:UNIXCONTENTS
5:MEMORY
6:DeviceDrivers
7:Device Control
9:IPC Concepts
10:System V standards
[Karthikeyan@Host1 ~]$ grep -n ^[^A-Z] Input5 ## Line NOT START WITH UPPER CASE chars
3:file
4:process
11:posix 1003 stds
12:12345
13:#####
[Karthikeyan@Host1 ~]$ grep -n ^[A-Za-z] Input5 ## Line start with any case
1:UNIXCONTENTS
3:file
4:process
5:MEMORY
6:DeviceDrivers
7:Device Control
9:IPC Concepts
10:System V standards
11:posix 1003 stds
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat >Input5
UNIXCONTENTS

file
process
MEMORY
DeviceDrivers
Device Control

IPC Concepts
System V standards
posix 1003 stds
12345
#####
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^[0-9].*[0-9]$ Input5 ## Line Matched only Numbers
12:12345
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

Karthikeyan@Host1:~

Karthikeyan@Host1:~

```
[Karthikeyan@Host1 ~]$ cat >Input5
UNIXCONTENTS

file
process
MEMORY
DeviceDrivers
Device Control

IPC Concepts
System V standards
posix 1003 stds
12345
#####
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

```
File Edit View Search Terminal Help
6:DeviceDrivers
7:Device Control
9:IPC Concepts
10:System V standards
[Karthikeyan@Host1 ~]$ grep -n ^[A-Z] Input5 ## Line NOT START WITH UPPER CASE chars
3:file
4:process
11:posix 1003 stds
12:12345
13:#####
[Karthikeyan@Host1 ~]$ grep -n ^[A-Za-z] Input5 ## Line start with any case
1:UNIXCONTENTS
3:file
4:process
5:MEMORY
6:DeviceDrivers
7:Device Control
9:IPC Concepts
10:System V standards
11:posix 1003 stds
[Karthikeyan@Host1 ~]$ grep -n [0-9] Input5 ## Line Matched any digits
11:posix 1003 stds
12:12345
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

Applications Places System 81 °F Fri Dec 18, 03:18:45 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat >Input5
UNIXCONTENTS
file
process
MEMORY
DeviceDrivers
Device Control
IPC Concepts
System V standards
posix 1003 stds
12345
#####
[Karthikeyan@Host1 ~]$
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n ^[0-9].*[0-9]$ Input5 ## Line Matched only Numbers
12:12345
[Karthikeyan@Host1 ~]$ grep -n ^[A-Za-z0-9].* Input5 ## Line start with Any case(upper or lower) or number
1:UNIXCONTENTS
3:file
4:process
5:MEMORY
6:DeviceDrivers
7:Device Control
9:IPC Concepts
10:System V standards
11:posix 1003 stds
12:12345
[Karthikeyan@Host1 ~]$ grep -n [^A-Za-z0-9].* Input5 ## Line NOT MATCHED WITH UPPER CASE,LOWER CASE & DIGITS
7:Device Control
9:IPC Concepts
10:System V standards
11:posix 1003 stds
13:#####
[Karthikeyan@Host1 ~]$ ### The above one matched with Upper case/Lower case Numbers and Space
[Karthikeyan@Host1 ~]$ ###
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~

Applications Places System 81 °F Fri Dec 18, 03:19:31 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat >Input5
UNIXCONTENTS
file
process
MEMORY
DeviceDrivers
Device Control

IPC Concepts
System V standards
posix 1003 stds
12345
#####
[Karthikeyan@Host1 ~]$
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ grep -n [^A-Za-z0-9].* Input5 ## Line NOT MATCHED WITH UPPER CASE,LOWER CASE & DIGITS
7:Device Control
9:IPC Concepts
10:System V standards
11:posix 1003 stds
13:#####
[Karthikeyan@Host1 ~]$ ### The above one matched with Upper case/Lower case Numbers and Space
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n [^A-Za-z0-9" "].* Input5 ## Display only special chars
13:#####
[Karthikeyan@Host1 ~]$ 
```

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

[Karthikeyan@Host1 ~]\$ cat >Input5

UNIXCONTENTS

file  
process  
MEMORY  
DeviceDrivers  
Device Control  
  
IPC Concepts  
System V standards  
posix 1003 stds  
12345  
#####

[Karthikeyan@Host1 ~]\$

File Edit View Search Terminal Help

[Karthikeyan@Host1 ~]\$ grep -n [^A-Za-z0-9].\* Input5 ## Line NOT MATCHED WITH UPPER CASE,LOWER CASE & DIGITS

7:Device Control  
9:IPC Concepts  
10:System V standards  
11:posix 1003 stds  
13:#####  
[Karthikeyan@Host1 ~]\$ ### The above one matched with Upper case/Lower case Numbers and Space

[Karthikeyan@Host1 ~]\$

[Karthikeyan@Host1 ~]\$ grep -n [^A-Za-z0-9" "].\* Input5 ## Display only special chars

13:#####

[Karthikeyan@Host1 ~]\$

Karthikeyan@Host1:~

Karthikeyan@Host1:~

Lord Muruga Songs.mp...

Applications Places System 81 °F Fri Dec 18, 03:23:10 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input6
1 Item W3 cost is:4560$
2 Item W2 cost is:4532INR
3 Item W1 cost is:3000$
4 Item W5 cost is:4565$
5 Item W9 cost is:4500INR
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ ## Display line end with $
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n \$$ Input6
1:Item W3 cost is:4560$
3:Item W1 cost is:3000$
4:Item W5 cost is:4565$
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ Lord Muruga Songs.mp...

Applications Places System 81 °F Fri Dec 18, 03:23:40 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input6
1 Item W3 cost is:4560$
2 Item W2 cost is:4532INR
3 Item W1 cost is:3000$
4 Item W5 cost is:4565$
5 Item W9 cost is:4500INR
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ ## Display line end with INR
[Karthikeyan@Host1 ~]$ 
[Karthikeyan@Host1 ~]$ grep -n INR$ Input6
2:Item W2 cost is:4532INR
5:Item W9 cost is:4500INR
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ Lord Muruga Songs.mp...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ echo "
abc
bash
tfeA
123
END
end
TEXT" |grep -nE 'a+'
2:abc
3:bash
[Karthikeyan@Host1 ~]$ # + -one more occurrence of previous character
```

Karthikeyan@Host1:~ [skanda sasti kavacha... Regular expressions in...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ echo "
abc
bash
tfeA
123
END
end
TEXT
acb"|grep -nE 'ab+'
2:abc
```

[Karthikeyan@Host1 ~]\$

Karthikeyan@Host1:~ Karthikeyan@Host1:~ [skanda sasti kavacha... Regular expressions in...

Applications Places System 81 °F Fri Dec 18, 03:51:23 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ echo "
abc
bash
tfeA
123
END
end
TEXT
acb"\|grep -nE 'ab+'
2:abc
```

```
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ echo "
abc
bash
tfeA
123
END
end
TEXT
acb"\|grep -nE '[aE]+'
2:abc
3:bash
6:END
8:TEXT
9:acb
```

```
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ [skanda sasti kavacha... Regular expressions in...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ echo "
abc
bash
tfmA
123
END
end
TEXT
acb" |grep -nE [A-Z]+
4:tfmA
6:END
8:TEXT
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ [skanda sasti kavacha... Regular expressions in...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input7
1 Text1 contents
2 Text2 details
3 unix essentials
4 N0space
5 Text3    text
6 Text4        text
[Karthikeyan@Host1 ~]$ grep -nE '[[[:space:]]+]' Input7
1:Text1 contents
2:Text2 details
3:unix essentials
5:Text3    text
6:Text4        text
[Karthikeyan@Host1 ~]$ grep -nE '[[[:space:]]?'
1:Text1 contents
2:Text2 details
3:unix essentials
4:N0space
5:Text3    text
6:Text4        text
[Karthikeyan@Host1 ~]$
```

Karthikeyan@Host1:~

Karthikeyan@Host1:~

[skanda sasti kavacha...]

Regular expressions in...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input7
1 Text1 contents
2 Text2 details
3 unix essentials
4 N0space
5 Text3    text
6 Text4        text
[Karthikeyan@Host1 ~]$ grep -nE '[[[:space:]]]+' Input7
1:Text1 contents
2:Text2 details
3:unix essentials
5:Text3    text
6:Text4        text
[Karthikeyan@Host1 ~]$ grep -nE '[[[:space:]]]?' Input7
1:Text1 contents
2:Text2 details
3:unix essentials
4:N0space
5:Text3    text
6:Text4        text
[Karthikeyan@Host1 ~]$
```

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input8
1 man
2 maan
3 Man
4 Men
5 Maan
6 Maaan
7 Maaaan
8 Maaaaan
9 maaaaaan
10 maan
[Karthikeyan@Host1 ~]$ grep -nE ma[2]n Input8
2:maan
10:maan
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~ Karthikeyan@Host1:~ [skanda sasti kavacha... Regular expressions in...

Applications Places System

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input8
1 man
2 maan
3 Man
4 Men
5 Maan
6 Maaan
7 Maaaan
8 Maaaaan
9 maaaaaan
10 maan
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -nE 'ma{2,}n' Input8
2:maan
9:maaaaaan
10:maan
[Karthikeyan@Host1 ~]$ 
```

Karthikeyan@Host1:~

Karthikeyan@Host1:~

[skanda sasti kavacha...]

Regular expressions in...

Applications Places System 79 °F Fri Dec 18, 04:02:17 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input8
1 man
2 maan
3 Man
4 Men
5 Maan
6 Maaan
7 Maaaan
8 Maaaaan
9 maaaaaan
10 maan
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -nE 'ma{2,}n' Input8
2:maan
9:maaaaaan
10:maan
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -nE 'ma{2,4}n' Input8
2:maan
10:maan
[Karthikeyan@Host1 ~]$ grep -nE 'ma{2,6}n' Input8
2:maan
9:maaaaaan
10:maan
[Karthikeyan@Host1 ~]$ 
```

Applications Places System 79 °F Fri Dec 18, 04:02:37 Karthikeyan

Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ cat -n Input8
1 man
2 maan
3 Man
4 Men
5 Maan
6 Maaan
7 Maaaan
8 Maaaaan
9 maaaaaan
10 maan
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -nE 'ma{2,}n' Input8
2:maan
9:maaaaaan
10:maan
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -nE 'ma{2,4}n' Input8
2:maan
10:maan
[Karthikeyan@Host1 ~]$ grep -nE 'ma{2,6}n' Input8
2:maan
9:maaaaaan
10:maan
[Karthikeyan@Host1 ~]$ grep -nE '[mM]a{2,6}n' Input8
2:maan
5:Maan
6:Maaan
7:Maaaan
8:Maaaaan
9:maaaaaan
10:maan
[Karthikeyan@Host1 ~]$ 
```

Applications Places System  79 °F Fri Dec 18, 04:07:09 Karthikeyan

Karthikeyan@Host1:~

```
File Edit View Search Terminal Help
[Karthikeyan@Host1 ~]$ ## Alternate |
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -nE 'root|daemon|Admin|user1' /etc/passwd
1:root:x:0:0:root:/root:/bin/bash
3:daemon:x:2:2:daemon:/sbin/nologin
11:operator:x:11:0:operator:/root:/sbin/nologin
25:haldaemon:x:68:68:HAL daemon:/sbin/nologin
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ ## Admin and user1 patterns are not matched.
[Karthikeyan@Host1 ~]$ 
```

Applications Places System Karthikeyan@Host1:~

File Edit View Search Terminal Help

```
[Karthikeyan@Host1 ~]$ ## Admin and user1 patterns are not matched.
[Karthikeyan@Host1 ~]$ grep -nE 'root|daemon|Admin|user1' /etc/passwd
1:root:x:0:0:root:/bin/bash
3:daemon:x:2:2:daemon:/sbin/nologin
11:operator:x:11:0:operator:/root:/sbin/nologin
25:haldaemon:x:68:68:HAL daemon:/sbin/nologin
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -nE '(root|daemon|Admin|user1):x' /etc/passwd
1:root:x:0:0:root:/bin/bash
3:daemon:x:2:2:daemon:/sbin/nologin
25:haldaemon:x:68:68:HAL daemon:/sbin/nologin
[Karthikeyan@Host1 ~]$
[Karthikeyan@Host1 ~]$ grep -nE '(root|daemon|Admin|user1):x:[0-2]' /etc/passwd
1:root:x:0:0:root:/bin/bash
3:daemon:x:2:2:daemon:/sbin/nologin
[Karthikeyan@Host1 ~]$ 
```

Thank you