

**Lab 6 Assignment**

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Write a sed command to

1. print line numbers of lines beginning with "O"

```
└─$ sed -n '/^O/= ' g.txt
```

```
1
2
7
```

2. delete digits in the given input file.

```
└─$ sed 's/[0-9]//g' g.txt
```

```
Open the door to opportunity.
Ordinary day with surprises.
- This line has some digits.
Room is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
lines here
What is the line number of this?
Jefferies and hitchin.
:: PM in the middle of the day.
mcis program is at the university.
Social security number: --
Invalid social security: -.
Valid IP: ....
Invalid IP: ....
```

3. delete lines that contain both BEGIN and END

```
└─$ sed '/BEGIN.*END/d' g.txt
```

```
Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.
```

4. delete lines that contain BEGIN but not END

```
(sanju@kali)-[~/grep]
$ sed '/BEGIN/ { /END/!d }' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.
```

5. deletes the first character in each line in a file

```

$ sed 's/^./&/' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.
Files and folders.
She loves L in the middle.
Dates: 12-31-2023, 01/01/2020.
Short line.

```

6. deletes the last character in each line in a file

```

$ sed 's/.$//' g.txt

Open the door to opportunity
Ordinary day with surprises
12345 - This line has some digits
Room 101 is booked
Here is a line with both BEGIN and END in it
BEGIN but there is no END in this line
Once upon a time
Last character missing here
42 lines her
What is the line number of this
Jefferies and hitchin
12:34:56 PM in the middle of the day
mcis program is at the university
Social security number: 123-45-678
Invalid social security: 1234-56789
Valid IP: 192.168.0.1

```

7. deletes the first character, (if it numeric ) in each line in a file.

```

└─$ sed 's/^[0-9]//' g.txt

Open the door to opportunity.
Ordinary day with surprises.
2345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
2 lines here
What is the line number of this?
Jefferies and hitchin.
2:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.
Files and folders.
She loves L in the middle.
Dates: 12-31-2023, 01/01/2020.
Short line.
Another short line.
The quick brown fox jumps over the lazy dog.
Replace the word "mcis" with "sois" here.
SOIS will be added to the prefix of each line.
Sentence ending with a period.
Sentence with a question?

```

8. deletes the character before the last character in each line in a file.

```

└─$ sed 's/.\(.\)$/\1/' g.txt

Open the door to opportunit.
Ordinary day with surprise.
12345 - This line has some digit.
Room 101 is booke.
Here is a line with both BEGIN and END in i.
BEGIN but there is no END in this lin.
Once upon a tim.
Last character missing herz
42 lines hee

```

9. that swaps the first and second words in each line in a file

```
$ sed -E 's/^([[:alnum:]]+) ([[:alnum:]]+)/\2 \1/' g.txt
```

```
the Open door to opportunity.  
day Ordinary with surprises.  
12345 - This line has some digits.  
101 Room is booked.  
is Here a line with both BEGIN and END in it.  
but BEGIN there is no END in this line.  
upon Once a time.  
character Last missing herez  
lines 42 here  
is What the line number of this?  
and Jefferies hitchin.  
12:34:56 PM in the middle of the day.  
program mcis is at the university.  
security Social number: 123-45-6789  
social Invalid security: 1234-56789.  
IP Valid: 192.168.0.1.  
IP Invalid: 999.999.999.999.  
URL Website: http://manipal.edu.  
address Email: sample@manipal.edu  
email Improper: user@unknown.  
and Files folders.  
loves She L in the middle.
```

10. replace the word "mcis" with "sois" in the first five lines in a file

```
$ sed '1,5s/mcis/sois/g' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.  
mcis program is at the university.  
Social security number: 123-45-6789  
Invalid social security: 1234-56789.  
Valid IP: 192.168.0.1.  
Invalid IP: 999.999.999.999.  
Website URL: http://manipal.edu.  
Email address: sample@manipal.edu  
Improper email: user@unknown.
```

11. add "SOIS" prefix to all the lines

```

└─$ sed 's/^/SOIS /' g.txt

SOIS Open the door to opportunity.
SOIS Ordinary day with surprises.
SOIS 12345 - This line has some digits.
SOIS Room 101 is booked.
SOIS Here is a line with both BEGIN and END in it.
SOIS BEGIN but there is no END in this line.
SOIS Once upon a time.
SOIS Last character missing herez
SOIS 42 lines here
SOIS What is the line number of this?
SOIS Jefferies and hitchin.
SOIS 12:34:56 PM in the middle of the day.
SOIS mcis program is at the university.
SOIS Social security number: 123-45-6789
SOIS Invalid social security: 1234-56789.
SOIS Valid IP: 192.168.0.1.
SOIS Invalid IP: 999.999.999.999.
SOIS Website URL: http://manipal.edu.
SOIS Email address: sample@manipal.edu
SOIS Improper email: user@unknown.
SOIS Files and folders.
SOIS She loves L in the middle.
SOIS Dates: 12-31-2023, 01/01/2020.

```

12. add "." at the end of each line in the file.

```

└─$ sed 's/$/./' g.txt

Open the door to opportunity..
Ordinary day with surprises..
12345 - This line has some digits..
Room 101 is booked..
Here is a line with both BEGIN and END in it..
BEGIN but there is no END in this line..
Once upon a time..
Last character missing herez.
42 lines here.
What is the line number of this?.
Jefferies and hitchin..
12:34:56 PM in the middle of the day..
mcis program is at the university..
Social security number: 123-45-6789.
Invalid social security: 1234-56789..
Valid IP: 192.168.0.1..
Invalid IP: 999.999.999.999..
Website URL: http://manipal.edu..
Email address: sample@manipal.edu.
Improper email: user@unknown..

```

13. Pick the line with Social security number in the format of 999-99-9999

```
$ sed -n '/[0-9]\{3\}-[0-9]\{2\}-[0-9]\{4\}/p' g.txt
```

Social security number: 123-45-6789

14. Pick the Valid IP address of the computer (4 numbers separated by '.'). (e.g. 192.168.0.1)

```
$ sed -n '/\b[0-9]\{1,3\}\.[0-9]\{1,3\}\.[0-9]\{1,3\}\.[0-9]\{1,3\}\b/p' g.txt
```

Valid IP: 192.168.0.1.

Invalid IP: 999.999.999.999.

15. Pick the Valid URL beginning with "http://". (e.g. <http://manipal.edu>)

```
$ sed -n '/http:\/\/[a-zA-Z0-9.-]\+\. [a-z]\{2,4\}/p' g.txt
```

Website URL: <http://manipal.edu>.

HTML tags to remove: <BR>, <TABLE>, <A HREF="http://manipal.edu">.

16. Pick the Valid email address, assuming 'a-z','0-9','-'',' are the valid characters for user ID, and domain name has to end with either ".com" or ".net"

```
$ sed -n '/[a-z0-9.-]\+@[a-z0-9.-]\+\. (com|net)\b/p' g.txt
```

17. Print all lines containing words that start with "f" and end with "s".

```
$ sed -n '/\b[fF][a-zA-Z]*s\b/p' g.txt
```

Files and folders.

Renaming dog to cat across all .txt files

18. Print lines containing a capital "L", but not as the first character on the line

```
$ sed -n '/^[^L]*L/p' g.txt
```

Last character missing herez

Website URL: <http://manipal.edu>.

She loves L in the middle.

Large amount: 1,000,000.23

Leading zeroes: 00012345 and 00987.

HTML tags to remove: <BR>, <TABLE>, <A HREF="http://manipal.edu">.



19. matches dates in the American MM-DD-YYYY format where months and days can be 1 or 2 digits, years must be 4 digits starting with a 1 or a 2, and the delimiter is either "-" or "/" but not both.

```
└─$ sed -n '/\b([01-9]\|[10-2]\|[1-9])[-/](0[1-9]\|[12][0-9]\|3[01]\|[1-9])[-/](12)[0-9]\{3\}\b/p' g.txt
Dates: 12-31-2023, 01/01/2020.
```

20. print all the lines of a file that are less than 10 characters in length.

```
└─$ sed -n '/^.\{1,9\}$/p' g.txt
```

21. replace all occurrences in a file of "the" with "a" and "The" with "A".

```
└─$ sed 's/\bthe\b/a/g; s/\bThe\b/A/g' g.txt
```

```
Open a door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is a line number of this?
Jefferies and hitchin.
12:34:56 PM in a middle of a day.
mcis program is at a university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.
Files and folders.
She loves L in a middle.
Dates: 12-31-2023, 01/01/2020.
Short line.
Another short line.
A quick brown fox jumps over a lazy dog.
```

22. substitute the word "button" for "tree", only if tree occurs at the end of a line.

```
└─$ sed 's/tree$/button/' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.  
mcis program is at the university.  
Social security number: 123-45-6789  
Invalid social security: 1234-56789.  
Valid IP: 192.168.0.1.  
Invalid IP: 999.999.999.999.  
Website URL: http://manipal.edu.  
Email address: sample@manipal.edu  
Improper email: user@unknown.  
Files and folders.  
She loves L in the middle.  
Dates: 12-31-2023, 01/01/2020.  
Short line.
```

23. substitute the word foible for the word tree but not the word trees.

```
└─$ sed 's/\btree\b/foible/g' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.  
mcis program is at the university.  
Social security number: 123-45-6789  
Invalid social security: 1234-56789.  
Valid IP: 192.168.0.1.  
Invalid IP: 999.999.999.999.  
Website URL: http://manipal.edu.  
Email address: sample@manipal.edu  
Improper email: user@unknown.
```

24. change a text so that every period at the end of a sentence is changed to an exclamation point (!) and every question mark is replaced with an ellipsis (...)

```
└─$ sed 's/\.\\s*$!/;/g; s/?/.../g' g.txt
```

```
Open the door to opportunity!  
Ordinary day with surprises!  
12345 - This line has some digits!  
Room 101 is booked!  
Here is a line with both BEGIN and END in it!  
BEGIN but there is no END in this line!  
Once upon a time!  
Last character missing herez  
42 lines here  
What is the line number of this...  
Jefferies and hitchin!  
12:34:56 PM in the middle of the day!  
mcis program is at the university!  
Social security number: 123-45-6789  
Invalid social security: 1234-56789!  
Valid IP: 192.168.0.1!  
Invalid IP: 999.999.999.999!  
Website URL: http://manipal.edu!  
Email address: sample@manipal.edu  
Improper email: user@unknown!  
Files and folders!
```

25. Change every occurrence of the word 'me' with 'you' but only at the end of a line.

```
└─$ sed 's/me$/you/' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.  
mcis program is at the university.  
Social security number: 123-45-6789  
Invalid social security: 1234-56789.  
Valid IP: 192.168.0.1.  
Invalid IP: 999.999.999.999.  
Website URL: http://manipal.edu.  
Email address: sample@manipal.edu  
Improper email: user@unknown.  
Files and folders.  
She loves L in the middle.  
Dates: 12-31-2023, 01/01/2020.
```

26. change a document so that every occurrence of a three-letter abbreviation for a month is replaced by the appropriate number, i.e., Jan is replace by 1, Feb by 2 etc.

```

$ sed -e 's/\bJan\b/1/g' -e 's/\bFeb\b/2/g' -e 's/\bMar\b/3/g' -e 's/\bApr\b/4/g' -e 's/\bMay\b/5/g' -e 's/\bJun\b/6/g' -e 's/\bJul\b/7/g' -e 's/\bAug\b/8/g' -e 's/\bSep\b/9/g' -e 's/\bOct\b/10/g' -e 's/\bNov\b/11/g' -e 's/\bDec\b/12/g' g.txt
Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789.
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.

```

27. match lines containing (i) Jefferies jeffery jeffey (ii) hitchen hitchin hitching (iii) Heard herd Hird (iv) dix dicks dickson dixon (v) McGee mcghee magee.

```

$ sed -n '/b\(\Jefferies\|jeffery\|jeffey\|hitchen\|hitchin\|hitching\|Heard\|herd\|Hird\|dix\|dicks\|dickson\|dixon\|Mcgee\|mcghee\|magee\)\b/p' g.txt
Jefferies and hitchin.
hitchen hitchin herd herd
Jefferies jeffery jeffey.

```

28. replace all multiple spaces in a string by only one space.

```

$ sed 's/ */ /g' g.txt
Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.

```

29. A line comment in C is introduced by the sequence `//`. Alternatively the comment can be enclosed by `/*` and `*/`. Write a sed command which transforms the `//` comments to the enclosed ones.

```
└─$ sed 's|/|/(.*)|/* \1 */|' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.  
mcis program is at the university.  
Social security number: 123-45-6789  
Invalid social security: 1234-56789.  
Valid IP: 192.168.0.1.  
Invalid IP: 999.999.999.999.  
Website URL: http/* manipal.edu. */  
Email address: sample@manipal.edu  
Improper email: user@unknown.  
Files and folders.  
She loves L in the middle.  
Dates: 12-31-2023, 01/01/2020.  
Short line.  
Another short line.  
The quick brown fox jumps over the lazy dog.
```

30. Print alternative lines (line1,3,5...)

```

$ sed -n 'p;n' g.txt

Open the door to opportunity.
12345 - This line has some digits.
Here is a line with both BEGIN and END in it.
Once upon a time.
42 lines here
Jefferies and hitchin.
mcis program is at the university.
Invalid social security: 1234-56789.
Invalid IP: 999.999.999.999.
Email address: sample@manipal.edu
Files and folders.
Dates: 12-31-2023, 01/01/2020.
Another short line.
Replace the word "mcis" with "sois" here.
Sentence ending with a period.
me is at the end of this line.
hitchen hitchin herd herd
Jefferies jeffery jeffeys.
Change "user-friendly" to include double quotes.
This line has a hex number: 0xA0FF2375C3
dog in the line with cat somewhere.
Sentence-ending punctuation: stick!
dog1234 meets cat.
Trailing spaces and tabs follow
A line with one unmatched single quote: Here's the text.
1,234,567.23
file Mar.12.99 should become 1999-03-12

```

31. Change the letters "dog" to "HORSE" everywhere it occurs on all lines.

```

$ sed 's/dog/HORSE/g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.

```

32. Change all occurrences of the letters "Man" at the beginning of a line to "Person".

```

└─$ sed 's/^Man/Person/' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.
Files and folders.
She loves L in the middle.
Dates: 12-31-2023, 01/01/2020.
Short line.
Another short line.
The quick brown fox jumps over the lazy dog.

```

33. Change all occurrences of "stick" followed by any punctuation at the end of a line to "Stick.". (The punctuation is replaced by a period.)

```

└─$ sed 's/stick[[:punct:]]$/Stick./' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.

```

34. Change all occurrences of "Dog" or "dog" to "COW".



```

$ sed 's/[Dd]og/COW/g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.

```

35. Change all Canadian or American spellings of colour (color) to "Color".

```

$ sed 's/\bcolour\b/Color/g; s/\bcolor\b/Color/g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.

```

36. Double all vowels in every word on every line.



```

$ sed 's/[aeiouAEIOU]/&&g' g.txt

OOpeen thee dooor too ooppoortuuniity.
OOrdiinaary daay wiith suurpriiises.
12345 - Thiis liinee haas soomee diigiits.
Rooom 101 iis booookeed.
Heeree iis aa liinee wiith booth BEEGIIN aand EEND iin iit.
BEEGIIN buut theeree iis noo EEND iin thiis liinee.
OOncee uupoon aa tiimee.
Laast chaaraacter miissiing heereez
42 liinees heeree
Whaat iis thee liinee nuumbeer oof thiis?
Jeeffeeriies aand hiitchiin.
12:34:56 PM iin thee miiddlee oof thee daay.
mciis proograam iis aat thee uuniiveersiity.
Soociiaal seecuuriity nuumbeer: 123-45-6789
IInvaaliid soociiaal seecuuriity: 1234-56789.
Vaaliid IIP: 192.168.0.1.
IInvaaliid IIP: 999.999.999.999.
Weebsiitee UURL: http://maaniipaal.eeduu.
EEmaaiil aadresse: saamplee@maaniipaal.eeduu
IImproopeer eemaail: uuseer@uunknoown.

```

37. Triple the amount of space between every word.

```

$ sed 's/ /  /g' g.txt

Open  the  door  to  opportunity.
Ordinary  day  with  surprises.
12345  -  This  line  has  some  digits.
Room  101  is  booked.
Here  is  a  line  with  both  BEGIN  and  END  in  it.
BEGIN  but  there  is  no  END  in  this  line.
Once  upon  a  time.
Last  character  missing  herez
42  lines  here
What  is  the  line  number  of  this?
Jefferies  and  hitchin.
12:34:56  PM  in  the  middle  of  the  day.
mcis  program  is  at  the  university.
Social  security  number:  123-45-6789
Invalid  social  security:  1234-56789.
Valid  IP:  192.168.0.1.
Invalid  IP:  999.999.999.999.

```

38. Find and print lines that contain "dog" followed by any number of digits then "cat".

```

$ sed -n '/dog[0-9]*cat/p' g.txt

Another dog123cat example.

```

39. Find and print lines that contain the letters "dog" followed anywhere by the letters "cat".

```
└─$ sed -n '/dog.*cat/p' g.txt

dog in the line with cat somewhere.
Another dog123cat example.
dog1234 meets cat.
Renaming dog to cat across all .txt files
```

40. Change all occurrences of one or more digits to the single word "NUMBER".

```
└─$ sed 's/[0-9]\+/NUMBER/g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
NUMBER - This line has some digits.
Room NUMBER is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
NUMBER lines here
What is the line number of this?
Jefferies and hitchin.
NUMBER:NUMBER:NUMBER PM in the middle of the day.
mcis program is at the university.
Social security number: NUMBER-NUMBER-NUMBER
Invalid social security: NUMBER-NUMBER.
Valid IP: NUMBER.NUMBER.NUMBER.NUMBER.
Invalid IP: NUMBER.NUMBER.NUMBER.NUMBER.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.
Files and folders.
She loves L in the middle.
Dates: NUMBER-NUMBER-NUMBER. NUMBER/NUMBER/NUMBER.
```

41. Replace all occurrences of one or more blanks with a single blank.

```
└─$ sed 's/\ +/ /g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
```

42. Replace all occurrences of one or more tabs or blanks with a single blank.

```
└─$ sed 's/[ \t]\+/ /g' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.
```

43. Remove the first 8 characters from every line.

```
└─$ sed 's/^\.{8\}//' g.txt
```

```
door to opportunity.  
day with surprises.  
This line has some digits.  
is booked.  
a line with both BEGIN and END in it.  
t there is no END in this line.  
n a time.  
racter missing herez  
here  
the line number of this?  
s and hitchin.  
PM in the middle of the day.  
gram is at the university.  
ecurity number: 123-45-6789  
social security: 1234-56789.
```

44. Remove all leading blanks or tabs from all lines.

```
└─$ sed 's/^[ \t]*//' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.
```

45. Remove all trailing blanks or tabs from all lines.

```

$ sed 's/[ \t]*$//' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.

```

46. Replace all tab characters with eight spaces.

```

$ sed 's/\t/ /g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1

```

47. Change all punctuation so that the sentence period lies outside of the closing double quote, e.g. "Hello there." becomes "Hello there".

```
└─$ sed 's/\("\)\.\./1/' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.
```

48. Remove everything leading up to and including the last blank on each line.

```
└─$ sed 's/.* //g' g.txt
```

```
opportunity.  
surprises.  
digits.  
booked.  
it.  
line.  
time.  
herez  
here  
this?  
hitchin.
```

49. Remove everything including and after the first blank on each line.

```
└─$ sed 's/ .*$//' g.txt
```

```
Open  
Ordinary  
12345  
Room  
Here  
BEGIN  
Once  
Last  
42  
What  
Jefferies  
12:34:56  
,
```

50. Put double quotes around every occurrence of the phrase "user-friendly".

```

└─$ sed 's/user-friendly/"&"/g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.

```

51. Add an extra blank after every period at the end of a sentence.

```

└─$ sed 's/\.\s*/. /g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192. 168. 0. 1.
Invalid IP: 999. 999. 999. 999.
Website URL: http://manipal. edu
Email address: sample@manipal. edu
Improper email: user@unknown.
Files and folders.

```

52. Make sure that every period at the end of a sentence is followed by exactly two blanks.

```
└─$ sed 's/\\.\\s*/. /g' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.  
mcis program is at the university.
```

53. Truncate every line to ten characters.

```
└─$ sed 's/^\(.\\{10\\}\\).*$/\1/' g.txt
```

```
Open the d  
Ordinary d  
12345 - Th  
Room 101 i  
Here is a  
BEGIN but  
Once upon  
Last chara  
42 lines h  
What is th  
Jefferies  
12:34:56 P  
mcis progr  
Social sec  
Invalid so  
Valid IP:  
Invalid IP  
Website UR  
Email addr  
Improper e  
Files and  
She loves
```

54. Exchange the first 10 characters with the next 15 characters on every line.



```
└─$ sed 's/^\(.{10}\)\(.{15}\)/\2\1/' g.txt
```

```
oor to opportunOpen the dity.  
ay with surprisOrdinary des.  
is line has som12345 - The digits.  
Room 101 is booked.  
line with both Here is a BEGIN and END in it.  
there is no ENDBEGIN but in this line.  
Once upon a time.  
cter missing heLast chararez  
42 lines here  
e line number oWhat is thf this?  
Jefferies and hitchin.  
M in the middle12:34:56 P of the day.  
am is at the unmcis progriversity.  
urity number: 1Social sec23-45-6789  
cial security: Invalid so1234-56789.  
Valid IP: 192.168.0.1.  
: 999.999.999.9Invalid IP99.  
L: http://manipWebsite URal.edu.
```

55. Exchange the first number with the second number on every line.

```
└─$ sed -E 's/([0-9]+)([0-9]*)([0-9]+)/\3\2\1/' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
51234 - This line has some digits.  
Room 110 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
24 lines here  
What is the line number of this?  
Jefferies and hitchin.  
34:12:56 PM in the middle of the day.  
mcis program is at the university.  
Social security number: 45-123-6789  
Invalid social security: 56789-1234.  
Valid IP: 168.192.0.1.  
Invalid IP: 999.999.999.999.  
Website URL: http://manipal.edu.  
Email address: sample@manipal.edu  
Improper email: user@unknown.
```

56. Remove all leading zeroes from the first number on each line. Don't mishandle single digit zeroes.



```
$ sed 's/\b0*\([1-9][0-9]*\)/\1/' g.txt
```

```
Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?  
Jefferies and hitchin.  
12:34:56 PM in the middle of the day.  
mcis program is at the university.  
Social security number: 123-45-6789  
Invalid social security: 1234-56789.  
Valid IP: 192.168.0.1.  
Invalid IP: 999.999.999.999.  
Website URL: http://manipal.edu.
```

57. Find and print lines that contain all the vowels in alphabetical order, a before e before i before o before u. Test using /usr/dict/words.

```
$ sed -n '/a.*e.*i.*o.*u/p' g.txt
```

```
Change "user-friendly" to include double quotes.
```

58. Find and print lines that contain all the vowels in any order. Test using /usr/dict/words.

```
$ sed -n '/[aA].*[eE].*[iI].*[oO].*[uU]/p' g.txt
```

```
Change "user-friendly" to include double quotes.  
A line with one unmatched single quote: Here's the text.
```

59. Change all occurrences of one or more digits surrounded by spaces to the word "NUMBER" also surrounded by spaces.

```

$ sed 's/ [0-9]\+ / NUMBER /g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room NUMBER is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu

```

60. Change only the second occurrence of a single blank to a colon in each line.

```

$ sed 's/ /:/2' g.txt

Open the:door to opportunity.
Ordinary day:with surprises.
12345 -:This line has some digits.
Room 101:is booked.
Here is:a line with both BEGIN and END in it.
BEGIN but:there is no END in this line.
Once upon:a time.
Last character:missing herez
42 lines:here
What is:the line number of this?
Jefferies and:hitchin.
12:34:56 PM:in the middle of the day.
mcis program:is at the university.
Social security:number: 123-45-6789
Invalid social:security: 1234-56789.
Valid IP::192.168.0.1.
Invalid IP::999.999.999.999.

```

61. Change the only the second-to-last single blank to a colon in each line.

```
$ sed -E ':a; s/ (.*) /\1:/; ta' g.txt
```

```
Openthe doorto :::opportunity.  
Ordinary daywith ::surprises.  
12345-Thislinehassome ::::digits.  
Room101is ::booked.  
Hereis a line with both BEGIN and END in :::::::it.  
BEGIN but there is no END in this :::::::line.  
Once upon a ::time.  
Last character missing ::herez  
42 lines :here  
What is the line number of :::::this?  
Jeffries and :hitchin.  
12:34:56 PM in the middle of the ::::::day.  
mcis program is at the ::::university.  
Social security number: ::123-45-6789  
Invalid social security: ::1234-56789.  
Valid IP: :192.168.0.1.  
Invalid IP: :999.999.999.999.  
Website URL: :http://manipal.edu.  
Email address: :sample@manipal.edu  
Improper email: :user@unknown.  
Files and :folders.  
She loves Lin the ::::middle.  
Dates: 12-31-2023, :01/01/2020.  
Short line.  
Another short :line.  
The quick brown fox jumps over the lazy ::::::dog.  
Replace the word "mcis" with "sois" :::::here.
```

62. Change only the second occurrence of a string of one or more blanks to a colon in each line.

```

$ sed 's/ */:/2' g.txt

Open the:door to opportunity.
Ordinary day:with surprises.
12345 -:This line has some digits.
Room 101:is booked.
Here is:a line with both BEGIN and END in it.
BEGIN but:there is no END in this line.
Once upon:a time.
Last character:missing herez
42 lines:here
What is:the line number of this?
Jefferies and:hitchin.
12:34:56 PM:in the middle of the day.
mcis program:is at the university.
Social security:number: 123-45-6789
Invalid social:security: 1234-56789.
Valid IP::192.168.0.1.
Invalid IP::999.999.999.999.
Website URL::http://manipal.edu.
Email address::sample@manipal.edu
Improper email::user@unknown.

```

63. Change only the second-to-last occurrence of a string of one or more blanks to a colon in each line.

```

$ sed -E ':a; s/ *(.*) */\1:/; ta' g.txt

Openthe doorto :::opportunity.
Ordinarydaywith ::surprises.
12345-Thislinehassome ::::digits.
Room101is ::booked.
HereisalinewithbothBEGINandENDin ::::::it.
BEGINbutthereisnoENDinthis ::::::line.
Onceupona ::time.
Lastcharactermissing ::herez
42lines :here
Whatisthelinenumerofof ::::this?
Jefferiesand :hitchin.
12:34:56PMinthemiddleofthe ::::day.
mcisprogramisatthe ::::university.
Socialsecuritynumber: ::123-45-6789
Invalidsocialsecurity: ::1234-56789.
ValidIP: :192.168.0.1.
InvalidIP: :999.999.999.999.
WebsiteURL: :http://manipal.edu.

```

64. Remove all occurrences of HTML tags whose open and closing angle brackets are on the same line (e.g. <BR>, <TABLE>, <A HREF="...">, etc.). Remove all of them, not just the first ones.

```

└─$ sed 's/<[^>]*>//g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.

```

65. Remove everything on every line that appears between double quotes, leaving only the quotes. (Example: a "bcd" efg "h i" j --> a "" efg "" j ) Handle empty strings (adjacent quotes) correctly

```

└─$ sed 's/"[^"]*"//g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu
Improper email: user@unknown.

```

66. Find lines that contain only one single quote character (an unmatched quote).

```

└─$ sed -n '/^[^']**(\'[^\']*\\)\$/p' g.txt

quote> hai
quote>

```

67. Put double quotes around every occurrence of the phrase "user-friendly", unless the phrase already has double quotes around it.

```
└─$ # Convert $123.45 to 123.45CDN
sed 's/\$\[([0-9]*\.[0-9]*\)/\1CDN/g' g.txt
# Reverse: convert 123.45CDN to $123.45
sed 's/\([([0-9]*\.[0-9]*\)CDN\)/\1/g' g.txt
```

```
Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
```

68. Find all numbers prefixed by a dollar sign, remove the dollar sign, and suffix the number with "CDN", e.g. \$123.45 becomes 123.45CDN. Now do the reverse.

```
└─$ # Convert $123.45 to 123.45CDN
sed 's/\$\[([0-9]*\.[0-9]*\)/\1CDN/g' g.txt
# Reverse: convert 123.45CDN to $123.45
sed 's/\([([0-9]*\.[0-9]*\)CDN\)/\1/g' g.txt
```

```
Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
```

69. Find all numbers with periods separating decimals and change the periods to commas, e.g. 123.45 becomes 123,45. Now do the reverse.

```

└─$ # Convert decimal points to commas
sed 's/\([0-9]\+\)\.\([0-9]\+\)/\1,\2/g' g.txt
# Reverse: Convert commas back to decimal points
sed 's/\([0-9]\+\),\([0-9]\+\)/\1.\2/g' g.txt

```

```

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez

```

70. Find all numbers with commas separating sets of three digits and change all the commas to spaces, e.g. 1,234,567.23 becomes 1 234 567.23. (You may assume the only use of a comma immediately followed by three digits is as a separator.)

```

└─$ # Replace commas separating groups of three digits with spaces
sed 's/\([0-9]\+\),\([0-9]\{3\}\)/\1 \2/g' g.txt
# Reverse: Convert spaces back to commas
sed 's/\([0-9]\+\) \([0-9]\{3\}\)/\1,\2/g' g.txt

```

```

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789

```

71. Locate common misspellings and mistypings of "@college.com" and fix them all. (e.g. fix manipal.edu, etc.)



```
└─$ sed 's/@college[.]com/@college.com/g; s/@college[.]com/@college.com/g' g.txt
```

Open the door to opportunity.  
Ordinary day with surprises.  
12345 - This line has some digits.  
Room 101 is booked.  
Here is a line with both BEGIN and END in it.  
BEGIN but there is no END in this line.  
Once upon a time.  
Last character missing herez  
42 lines here  
What is the line number of this?

72. Remove either single or double quotes from around all strings of one or more digits, e.g. "10" or '10' become just 10. Now do the reverse (add quotes to all numbers).

```

|_ $ # Remove single or double quotes around numbers
sed 's/[\'"]([0-9]\+)[\'"]/\1/g' g.txt
# Add double quotes around numbers
sed 's/b\([0-9]\+\)b/\1"/g' g.txt

```

Open the door to opportunity.  
 Ordinary day with surprises.  
 12345 - This line has some digits.  
 Room 101 is booked.  
 Here is a line with both BEGIN and END in it.  
 BEGIN but there is no END in this line.  
 Once upon a time.

73. Locate hexadecimal numbers having the form "0xA0FF2375C3" and prefix them with the string "(HEX:)", e.g. 0xDEAD would appear as (HEX:)0xDEAD and 0xBEAD00BEAD00 would appear as (HEX:)0xBEAD00BEAD00. Now do the reverse (remove the prefixes).

```

└─$ # Prefix hexadecimal numbers with (HEX:)
sed 's/\(0x[A-Fa-f0-9]\+\)/(\HEX:)\1/g' g.txt
# Remove (HEX:) prefix
sed 's/(\HEX:)0x/0x/g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789

```

74. Use a single regular expression to change every occurrence of the word "dog" to be "dog-eat-dog" and "cat" to be "cat-eat-cat". Now do the reverse.



```

└─$ # Convert "dog" to "dog-eat-dog" and "cat" to "cat-eat-cat"
sed 's/\bdog\b/dog-eat-dog/g; s/\bcat\b/cat-eat-cat/g' g.txt
# Reverse: Convert "dog-eat-dog" back to "dog" and "cat-eat-cat" back to "cat"
sed 's/dog-eat-dog/dog/g; s/cat-eat-cat/cat/g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.

```

75. Produce a plain list of mail addresses and home pages for everyone with an account on this system.

```

└─$ sed -n 's/.*\(\b[A-Za-z0-9._%+-]\+@[A-Za-z0-9.-]\+\.[A-Za-z]\{2,}\b\).*/\1/p' g.txt

sed: -e expression #1, char 68: Unmatched \{

```

76. Write a script that will perform a simple substitution on the contents of each of the files given on the command line, e.g. `./script 's/dog/cat/g' *.txt`

```

└─$ # Assuming `substitute.sh` contains:
# #!/bin/bash
# sed -i "$1" "$@"

# Run with:
./substitute.sh 's/dog/cat/g' g.txt

zsh: no such file or directory: ./substitute.sh

```

76. Have every new sentence in a document start at the beginning of a line. (Insert newline characters at the end of every sentence.)

```

└─$ # Assuming `substitute.sh` contains:
# #!/bin/bash
# sed -i "$1" "$@"

# Run with:
./substitute.sh 's/dog/cat/g' g.txt

zsh: no such file or directory: ./substitute.sh

```

77. Find and print lines where all vowels are in strict alphabetical order, i.e. no e precedes an a, no i precedes an e, no o precedes an i, etc. All vowels that appear are in alphabetical order in the input, from left to right. Test your expression on `/usr/dict/words`.

```

└─$ sed 's/[.!?] */&\n/g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here

```

78. Change the second and all subsequent occurrences of one or more blanks to single blanks. (The first occurrence of a string of blanks is untouched.)

```

└─$ sed -n '/a.*e.*i.*o.*u/p' /usr/dict/words

sed: can't read /usr/dict/words: No such file or directory

```

79. A file has a large number of columns of numbers separated by blanks. Change every second string of blanks to a colon. (A line of output might appear thus: 12 34:56 78:90 12) You don't know how many columns are in the input files.

```

└─$ sed 's/ */ /2g' g.txt

Open the door to opportunity.
Ordinary day with surprises.
12345 - This line has some digits.
Room 101 is booked.
Here is a line with both BEGIN and END in it.
BEGIN but there is no END in this line.
Once upon a time.
Last character missing herez
42 lines here
What is the line number of this?
Jefferies and hitchin.
12:34:56 PM in the middle of the day.
mcis program is at the university.
Social security number: 123-45-6789
Invalid social security: 1234-56789.
Valid IP: 192.168.0.1.
Invalid IP: 999.999.999.999.
Website URL: http://manipal.edu.
Email address: sample@manipal.edu

```

80. Exchange the first number with the last number on every line.

```
└─$ sed 's/ */:/2g' g.txt
```

```
Open the:door:to:opportunity.  
Ordinary day:with:surprises.  
12345 -:This:line:has:some:digits.  
Room 101:is:booked.  
Here is:a:line:with:both:BEGIN:and:END:in:it.  
BEGIN but:there:is:no:END:in:this:line.  
Once upon:a:time.  
Last character:missing:herez  
42 lines:here  
What is:the:line:number:of:this?  
Jefferies and:hitchin.  
12:34:56 PM:in:the:middle:of:the:day.  
mcis program:is:at:the:university.  
Social security:number::123-45-6789  
Invalid social:security::1234-56789.  
Valid IP::192.168.0.1.  
Invalid IP::999.999.999.999.  
Website URL::http://manipal.edu.  
Email address::sample@manipal.edu  
Improper email::user@unknown.  
Files and:folders.
```