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## SED AND AWK COMMANDS

## Aim:

To learn the SED and AWK commands and their options in Linux.

## **Commands:**

## • sed:

**Description:** Sed is a stream editor. A stream editor is used to perform basic text transformations on an input stream (a file or input from a pipeline). While in some ways similar to an editor which permits scripted edits (Such as ed), sed works by making only one pass over the input(s), and is consequently more efficient. But it is sed's ability to filter text in a pipeline which particularly distinguishes it from other types of editors.

**Syntax:** ~\$ sed [options...] [script] [input files.....]

#### FILE:

cat student.txt

```
viswa@desktop: ~/2022242001
                                                                 Q
iswa@desktop:~/2022242001$ cat student.txt/
Register_no:
                                   Mark-1: Mark-2: Dept:
                                                             Gender:
                 Name:
9013
                 Peacock
                                   78
                                            90
                                                    cs
                                                             Female
9021
                 Turtle
                                   69
                                            80
                                                    cs
                                                             Male
                                            73
2003
                 Koala
                                   85
                                                    ECE
                                                             Female
                 Tiger
2001
                                   99
                                            98
                                                             Male
                                                    IT
9001
                 Lion
                                   68
                                            97
                                                    Mech
                                                             Male
                 Elephant
                                            70
                                                             Female
2002
                                   80
                                                    ΙT
9008
                 Snake
                                            65
                                                    Mech
                                                             Male
                                   40
                                                    EEE
                                                             Male
                 Fox
                                   98
viswa@desktop:~/2022242001$
```

# **Options:**

### 1. Replacing or substituting string:

sed 's/Female/Male/' student.txt

```
viswa@desktop: ~/2022242001
                                                                 Q
viswa@desktop:~/2022242001$ sed 's/Female/Male/' student.txt
                                   Mark-1: Mark-2: Dept:
Register_no:
                 Name:
                                                             Gender:
9013
                 Peacock
                                            90
                                                    CS
                                                             Male
                                   78
9021
                 Turtle
                                   69
                                            80
                                                    CS
                                                             Male
2003
                 Koala
                                   85
                                            73
                                                     ECE
                                                             Male
                                            98
2001
                 Tiger
                                   99
                                                     IT
                                                             Male
9001
                 Lion
                                   68
                                            97
                                                    Mech
                                                             Male
2002
                 Elephant
                                   80
                                            70
                                                             Male
                                                     IT
                                                     Mech
                                                             Male
9008
                 Snake
                                   40
                                            65
                 Fox
                                            70
                                                     EEE
                                                             Male
9006
                                   98
 iswa@desktop:~/2022242001$
```

### 2. Replacing the nth occurrence of a pattern in a line:

sed 's/Ma/Me/3' student.txt

```
viswa@desktop:~/2022242001$ sed 's/Ma/Me/3' student.txt
                                   Mark-1: Mark-2: Dept:
Register_no:
                  Name:
                                                              Gender:
9013
                  Peacock
                                    78
                                            90
                                                     CS
                                                               Female
                                   69
9021
                  Turtle
                                                     CS
                                            80
                                                              Male
2003
                 Koala
                                   85
                                            73
                                                     ECE
                                                              Female
2001
                  Tiger
                                    99
                                            98
                                                     ΙT
                                                              Male
9001
                  Lion
                                    68
                                            97
                                                     Mech
                                                              Male
2002
                  Elephant
                                    80
                                            70
                                                              Female
                                                     IT
9008
                  Snake
                                    40
                                            65
                                                     Mech
                                                              Male
9006
                  Fox
                                    98
                                                     EEE
                                            70
                                                              Male
```

### 3. Replacing all occurrences of the pattern in a line:

sed 's/Ma/Me/g' student.txt

```
viswa@desktop:~/2022242001$ sed
                                  's/Ma/Me/g' student.txt
Register_no:
                 Name:
                                   Merk-1: Merk-2: Dept:
                                                             Gender:
9013
                                   78
                                            90
                                                     CS
                                                             Female
                 Peacock
9021
                 Turtle
                                   69
                                            80
                                                     CS
                                                             Mele
2003
                 Koala
                                   85
                                                             Female
                                            73
                                                     ECE
2001
                 Tiger
                                   99
                                            98
                                                     IT
                                                             Mele
                 Lion
                                            97
                                                             Mele
9001
                                   68
                                                     Mech
2002
                 Elephant
                                   80
                                            70
                                                     ΙT
                                                             Female
9008
                                   40
                                            65
                 Snake
                                                     Mech
                                                             Mele
9006
                 Fox
                                   98
                                            70
                                                     EEE
                                                             Mele
viswa@desktop:~/2022242001$
```

#### 4. Replacing from nth occurrences to all occurrences in line:

sed 's/M/m/5g' student.txt

```
viswa@desktop:~/2022242001$ sed 's/M/m/5g' student.txt
Register_no:
                                   Mark-1: Mark-2: Dept:
                                                              Gender:
                 Name:
9013
                 Peacock
                                   78
                                            90
                                                     CS
                                                              Female
                                   69
9021
                 Turtle
                                            80
                                                     CS
                                                              Male
2003
                                   85
                                            73
                                                     ECE
                                                              Female
                 Koala
2001
                 Tiger
                                   99
                                            98
                                                              Male
                                                     IT
                 Lion
9001
                                   68
                                            97
                                                     Mech
                                                              Male
2002
                 Elephant
                                   80
                                            70
                                                     IT
                                                              Female
                 Snake
                                                     Mech
                                                              Male
9008
                                   40
                                            65
9006
                 Fox
                                   98
                                            70
                                                     EEE
                                                              Male
viswa@desktop:~/2022242001$
```

#### 5. Parenthesize first character of each word:

echo "Hello Everyone, This is from OS Lab" | sed 's/(b[A-Z])/((1)/g'

```
viswa@desktop: ~/2022242001 Q = - □ ×

viswa@desktop: ~/2022242001$ echo "Hello Everyone, This is from OS Lab" | sed 's/
\(\b[A-Z]\)/\(\1\)/g'
(H)ello (E)veryone, (T)his is from (O)S (L)ab
viswa@desktop: ~/2022242001$ □
```

### 6. Replacing string on a specific line number:

sed 's/Ma/Me/1g' student.txt

```
viswa@desktop:~/2022242001$ sed 's/Ma/Me/1g' student.txt
                                   Merk-1: Merk-2: Dept:
Register_no:
                 Name:
                                                             Gender:
9013
                 Peacock
                                   78
                                            90
                                                    cs
                                                              Female
9021
                                   69
                                            80
                                                    cs
                 Turtle
                                                             Mele
2003
                                   85
                                            73
                                                    ECE
                 Koala
                                                             Female
2001
                 Tiger
                                   99
                                            98
                                                    IT
                                                             Mele
                 Lion
9001
                                   68
                                            97
                                                    Mech
                                                             Mele
2002
                 Elephant
                                   80
                                            70
                                                    IT
                                                             Female
9008
                 Snake
                                   40
                                            65
                                                    Mech
                                                             Mele
9006
                 Fox
                                   98
                                            70
                                                     EEE
                                                             Mele
viswa@desktop:~/2022242001$
```

## 7. Duplicating the replaced line with /p flag:

sed 's/G/g/p' student.txt

```
42001$ sed 's/G/g/p' student.txt
 /iswa@desktop:~
Register_no:
                 Name:
                                   Mark-1: Mark-2: Dept:
                                                              gender:
                                   Mark-1: Mark-2: Dept:
                                                              gender:
Register_no:
                 Name:
9013
                 Peacock
                                   78
                                            90
                                                     CS
                                                              Female
9021
                                   69
                                            80
                                                     cs
                 Turtle
                                                              Male
2003
                 Koala
                                   85
                                            73
                                                     ECE
                                                              Female
2001
                 Tiger
                                   99
                                            98
                                                              Male
                 Lion
                                            97
9001
                                   68
                                                     Mech
                                                              Male
2002
                 Elephant
                                   80
                                            70
                                                     IT
                                                              Female
9008
                 Snake
                                   40
                                            65
                                                     Mech
                                                              Male
                                   98
9006
                 Fox
                                            70
                                                     EEE
                                                              Male
viswa@desktop:~/2022242001$
```

#### 8. Printing only the replaced lines:

sed -n 's/Elephant/Mamoth/p' student.txt

#### 9. Replacing string on a range of lines:

i) sed '1,2 s/t/T/' student.txt

```
viswa@desktop:~/2022242001$ sed
                                   '1,2 s/t/T/' student.txt
                                   Mark-1: Mark-2: Dept:
RegisTer_no:
                 Name:
                                                              Gender:
9013
                 Peacock
                                   78
                                            90
                                                    CS
                                                             Female
                                   69
                                            80
                                                    cs
9021
                 Turtle
                                                             Male
                                            73
                                                    ECE
                                                             Female
2003
                 Koala
                                   85
2001
                 Tiger
                                   99
                                            98
                                                     ΙT
                                                             Male
9001
                 Lion
                                   68
                                            97
                                                    Mech
                                                             Male
2002
                 Elephant
                                   80
                                            70
                                                    IT
                                                             Female
9008
                 Snake
                                   40
                                            65
                                                    Mech
                                                             Male
                 Fox
                                   98
                                            70
                                                     EEE
9006
                                                             Male
riswa@desktop:~/2022242001$
```

### ii) sed '2,\$ s/Male/MALE/' student.txt

```
viswa@desktop:~/2022242001$ sed '2,$ s/Male/MALE/' student.txt
                                  Mark-1: Mark-2: Dept:
Register_no:
                 Name:
                                                             Gender:
9013
                                                             Female
                 Peacock
                                   78
                                           90
                                                    CS
                                                    CS
9021
                 Turtle
                                   69
                                           80
                                                             MALE
                                                             Female
                 Koala
2003
                                  85
                                           73
                                                    ECE
2001
                 Tiger
                                   99
                                           98
                                                    IT
                                                             MALE
9001
                 Lion
                                   68
                                           97
                                                    Mech
                                                             MALE
                 Elephant
                                           70
                                                             Female
2002
                                  80
                                                    IT
9008
                                   40
                                           65
                                                             MALE
                 Snake
                                                    Mech
9006
                                   98
                                           70
                                                    EEE
                                                             MALE
viswa@desktop:~/2022242001$
```

#### 10. Deleting lines from a particular file:

a. To delete a particular line say in file:

sed '4d' student.txt

```
viswa@desktop:~/2022242001$ sed '4d' student.txt
Register_no:
                 Name:
                                   Mark-1: Mark-2: Dept:
                                                             Gender:
9013
                 Peacock
                                   78
                                            90
                                                    CS
                                                             Female
9021
                 Turtle
                                   69
                                            80
                                                    cs
                                                             Male
2001
                 Tiger
                                   99
                                            98
                                                    IT
                                                             Male
9001
                 Lion
                                   68
                                            97
                                                    Mech
                                                             Male
                                           70
2002
                 Elephant
                                                             Female
                                   80
                                                    IT
9008
                 Snake
                                   40
                                            65
                                                    Mech
                                                             Male
9006
                 Fox
                                   98
                                            70
                                                    EEE
                                                             Male
viswa@desktop:~/2022242001$
```

b. To delete a last line: sed '\$d' student.txt

```
viswa@desktop:~/2022242001$ sed '$d' student.txt
Register_no:
                 Name:
                                   Mark-1: Mark-2: Dept:
                                                             Gender:
9013
                 Peacock
                                   78
                                           90
                                                    CS
                                                             Female
9021
                 Turtle
                                   69
                                           80
                                                    cs
                                                             Male
2003
                 Koala
                                   85
                                           73
                                                    ECE
                                                             Female
2001
                 Tiger
                                   99
                                           98
                                                    ΙT
                                                             Male
                 Lion
9001
                                           97
                                                             Male
                                   68
                                                    Mech
                                                             Female
2002
                 Elephant
                                   80
                                           70
                                                    IT
9008
                 Snake
                                   40
                                           65
                                                    Mech
                                                             Male
viswa@desktop:~/2022242001$
```

c. To delete line from range x and y:

sed '2.3d' student.txt

```
viswa@desktop:~/2022242001$ sed '2,3d' student.txt
Register_no:
                                  Mark-1: Mark-2: Dept:
                                                            Gender:
                 Name:
2003
                 Koala
                                  85
                                           73
                                                    ECE
                                                            Female
2001
                                           98
                                                            Male
                 Tiger
                                                    IT
9001
                 Lion
                                  68
                                           97
                                                    Mech
                                                            Male
2002
                 Elephant
                                  80
                                           70
                                                            Female
                                                    ΙT
9008
                 Snake
                                  40
                                           65
                                                    Mech
                                                            Male
9006
                 Fox
                                  98
                                           70
                                                    EEE
                                                            Male
viswa@desktop:~/2022242001$
```

d. To delete from nth to last line:

sed '2,\$d' student.txt

```
viswa@desktop:~/2022242001$ sed '2,$d' student.txt
Register_no: Name: Mark-1: Mark-2: Dept: Gender:
viswa@desktop:~/2022242001$ [
```

e. To delete pattern matching line:

sed '/Male/d' student.txt

```
viswa@desktop:~/2022242001$ sed '/Male/d' student.txt
Register no:
                Name:
                                 Mark-1: Mark-2: Dept:
                                                           Gender:
9013
                Peacock
                                          90
                                                           Female
                                 78
                                                  CS
2003
                Koala
                                 85
                                          73
                                                  ECE
                                                           Female
2002
                Elephant
                                 80
                                          70
                                                  ΙT
                                                           Female
viswa@desktop:~/2022242001$
```

## awk:

**Description:** Awk is a scripting language used for manipulating data and generating reports. The awk command programming language requires no compiling and allows the user to use variables, numeric functions, string functions, and logical operators.

**Syntax:** ~\$ awk options 'selection \_criteria {action}' input-file > output-file

## **Options:**

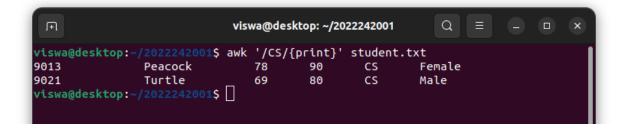
#### 1. Default behaviour of AWK command:

awk '{print}' student.txt

```
viswa@desktop:~/2022242001$ awk '{print}' student.txt
Register_no:
                 Name:
                                   Mark-1: Mark-2: Dept:
                                                             Gender:
9013
                 Peacock
                                   78
                                           90
                                                    CS
                                                             Female
9021
                 Turtle
                                   69
                                           80
                                                    cs
                                                             Male
2003
                 Koala
                                   85
                                           73
                                                    ECE
                                                             Female
2001
                                   99
                                           98
                                                             Male
                 Tiger
9001
                 Lion
                                   68
                                           97
                                                    Mech
                                                             Male
2002
                 Elephant
                                   80
                                           70
                                                    ΙT
                                                             Female
9008
                 Snake
                                   40
                                           65
                                                    Mech
                                                             Male
9006
                 Fox
                                   98
                                           70
                                                    EEE
                                                             Male
viswa@desktop:~/2022242001$
```

### 2. Print matching lines with pattern:

awk'/CS/{print}' student.txt



## 3. Splitting a line into fields

awk'{print\$1,\$4}' student.txt

```
viswa@desktop:~/2022242001$ awk '{print$1,$4}' student.txt
Register_no: Mark-2:
9013 90
9021 80
2003 73
2001 98
9001 97
2002 70
9008 65
9006 70
viswa@desktop:~/2022242001$
```

#### **Built in variables:**

1. NR:

Record current number of input counts. awk '{print NR, \$1}' student.txt

```
viswa@desktop:~/2022242001$ awk '{print NR,$1}' student.txt
1 Register_no:
2 9013
3 9021
4 2003
5 2001
6 9001
7 2002
8 9008
9 9006
viswa@desktop:~/2022242001$
```

2. NF:

Record number of fields in current input. awk '{print NF, \$1}' student.txt

```
viswa@desktop:~/2022242001$ awk '{print NF,$1}' student.txt
6 Register_no:
6 9013
6 9021
6 2003
6 2001
6 9001
6 2002
6 9008
6 9006
viswa@desktop:~/2022242001$
```

3. Display a range of lines with NR:

```
awk 'NR==2, NR==5{print NR, $0}' student.txt
```

```
viswa@desktop:~/2022242001$ awk 'NR==2,NR==5{print NR,$0}' student.txt
2 9013
                 Peacock
                                  78
                                           90
                                                    cs
                                                            Female
3 9021
                                  69
                                           80
                                                   CS
                                                            Male
                 Turtle
 2003
                 Koala
                                  85
                                           73
                                                    ECE
                                                            Female
  2001
                 Tiger
                                  99
                                           98
                                                    IT
                                                            Male
  .swa@desktop:~
```

4. To print first item with '-' separation:

```
awk '{print NR '-' $1}' student.txt
```

```
viswa@desktop:~/2022242001$ awk '{print NR '-' $1}' student.txt
1
-9011
-9018
-1999
-1996
-8995
-1995
-9000
-8997
viswa@desktop:~/2022242001$
```

5. To return second row/item:

awk '{print \$2}' student.txt

```
viswa@desktop:~/2022242001$ awk '{print $2}' student.txt
Name:
Peacock
Turtle
Koala
Tiger
Lion
Elephant
Snake
Fox
viswa@desktop:~/2022242001$
```

6. To count the lines in a file:

awk'{print NR}' student.txt

```
viswa@desktop:~/2022242001$ awk '{print NR}' student.txt
1
2
3
4
5
6
7
8
9
```

7. Print lines more than n characters:

awk 'length(\$0)>15' student.txt

```
viswa@desktop:~/2022242001$ awk 'length($0)>15' student.txt
                                                           Gender:
Register_no:
                                  Mark-1: Mark-2: Dept:
                Name:
9013
                                                   cs
                                                            Female
                Peacock
                                  78
                                          90
9021
                 Turtle
                                  69
                                          80
                                                           Male
                                  85
2003
                Koala
                                                   ECE
                                                            Female
                                  99
2001
                Tiger
                                          98
                                                   IT
                                                           Male
9001
                Lion
                                  68
                                          97
                                                   Mech
                                                           Male
2002
                Elephant
                                  80
                                          70
                                                            Female
                                                   IT
                Snake
9008
                                  40
                                          65
                                                   Mech
                                                           Male
                 Fox
                                                   EEE
                                                           Male
viswa@desktop:~/2022242001$
```

8. To check for any string in any column:

```
awk '{if($3 = $"78")print $0;}' student.txt
```

```
viswa@desktop: ~/2022242001 Q = - - ×

viswa@desktop: ~/2022242001$ awk '{if( $3=="78") print $0;}' student.txt

9013 Peacock 78 90 CS Female

viswa@desktop: ~/2022242001$
```

9. To print square of 1st n numbers

```
awk 'BEGIN { for(i=1:i<=4:i++)print "sq. of " i "is" i*i: } '
```

## **Result:**

Thus, the various options in Sed and Awk commands were learned in Linux.