

Assignment :1

Section : A Roll no : 422141

1)grep:

1>grep -c pattern filename~ this prints only a count of the lines that match the pattern(words,nums,charcs).

2>grep -h pattern filename ~ display the matched lines, but do not display the filenames . 3>grep -i pattern filename ~ ignores case for matching.

4>grep -n pattern filename ~ display the matched lines and their line numbers. 5>grep -v pattern filename ~ this prints out all the lines that do not matches the pattern.

```
[akshaya@Akshayas-MacBook-Pro ~ % cat > new.txt
unix lab
roll no: 422141
sectuon : A
unix lab
roll no: 422141
section: A
[akshaya@Akshayas-MacBook-Pro ~ % grep -c lines new.txt
0
[akshaya@Akshayas-MacBook-Pro ~ % grep -c lines file.txt
0
[akshaya@Akshayas-MacBook-Pro ~ % cat > newfile.txt
lines
lines
new lines
[akshaya@Akshayas-MacBook-Pro ~ % grep -c lines newfile.txt
3
[akshaya@Akshayas-MacBook-Pro ~ % grep -h lines newfile.txt
lines
lines
new lines
[akshaya@Akshayas-MacBook-Pro ~ % grep -i lines newfile.txt
lines
lines
new lines
[akshaya@Akshayas-MacBook-Pro ~ % grep -n lines newfile.txt
1:lines
2:lines
3:new lines
[akshaya@Akshayas-MacBook-Pro ~ % grep -v lines newfile.txt
[akshaya@Akshayas-MacBook-Pro ~ % cat >> newfile.txt
unix lab
os
[akshaya@Akshayas-MacBook-Pro ~ % grep -v lines newfile.txt
unix lab
os
akshaya@Akshayas-MacBook-Pro ~ %
```

2. uniq command:

1>uniq -c filename~ it tells how many times a line was repeated by displaying a number as a prefix with the line

2>uniq -d filename ~ it only prints the repeated lines and not the lines which are not repeated

3>uniq -f N ~ -skip fields(N) : it allows you to skip N fields (a field is a group of characters, delimited by whitespace) of a line before determining the uniqueness of a line

. 4>uniq -i ~ -ignore case : By default , comparisons done are case sensitive but with option(i) case insensitive comparisons can be made

5>uniq -s N ~ skip chars(N) : it doesn't compare the first N characters of each line while determining

uniqueness. This is like the -f option but it skips the individual characters rather than fields

6>uniq -u ~ -unique : it allows you to print only unique lines

7>uniq -z ~ -zero terminated: it will make a line end with 0 bytes(NULL),instead of a newline

8>uniq -w N ~ check chars(N) ~it only compares N characters in line x`

```
skhayay@MacBook-Pro ~ % cd Desktop  
skhayay@MacBook-Pro Desktop % cat > need.txt  
repeated line  
repeated line  
this is a new line  
this is a new line  
repeated line  
created the new line that was not repeated  
created the new line that was not repeated  
add a new line  
delete the previous line  
i repeated line  
i repeated line  
i this is a new line  
i repeated line  
i created the new line that was not repeated  
i created the new line that was not repeated  
i and a new line  
i delete the previous line  
this is a new line  
skhayay@MacBook-Pro Desktop % unix -fN need.txt  
unix: illegal field size value: N  
skhayay@MacBook-Pro Desktop % unix -f3 need.txt  
repeated line  
this is a new line  
repeated line  
created the new line that was not repeated  
add a new line  
delete the previous line  
repeated line  
repeated line  
this is a new line  
repeated line  
created the new line that was not repeated  
created the new line that was not repeated  
add a new line  
delete the previous line  
repeated line  
repeated line  
this is a new line  
repeated line  
created the new line that was not repeated  
created the new line that was not repeated  
add a new line  
skhayay@MacBook-Pro Desktop %
```

```
add a new line
delete the previous line
repeated line
repeated line
>this is a new line
repeated line
created the new line that was not repeated
created the new line that was not repeated
add a new line
delete the previous line
repeated line
repeated line
>this is a new line
repeated line
created the new line that was not repeated
created the new line that was not repeated
add a new line
skishayev@MacBook-Pro:Desktop % uniq -w 3 new.txt
uniq: illegal field skip value: N
skishayev@MacBook-Pro:Desktop % uniq -w 3 new2.txt
repeated line
>this is a new line
repeated line
created the new line that was not repeated
add a new line
delete the previous line
repeated line
repeated line
>this is a new line
repeated line
created the new line that was not repeated
created the new line that was not repeated
add a new line
delete the previous line
usage: uniq [-c] [-d] [-f] [-i] [-n] [-w] [-f Fields] [-s shared] [-input Inputfile] [-o Outputfile]
skishayev@MacBook-Pro:Desktop % uniq -w 3 new3.txt
repeated line
>this is a new line
repeated line
created the new line that was not repeated
created the new line that was not repeated
add a new line
delete the previous line
repeated line
repeated line
>this is a new line
repeated line
created the new line that was not repeated
created the new line that was not repeated
add a new line
delete the previous line
```

3)tr command

1>cat filename | tr [a-z] [A-Z] ~ converts lower case characters to upper case characters

2>cat filename |tr [:lower:] [:upper:] ~ converts lower case characters to upper case characters
3>echo "sentence" | tr [:space:] '\t' ~ translates white-space characters to tabs
4>\$ tr "{}" "() newfile.txt~ translates braces into parenthesis.

5>echo "sentence" | tr -s " " ~ to squeeze a sequence of repetitive characters using -s option

6>tr -s " " <<< "sentence" ~to squeeze a sequence of repetitive characters using -s option but using a string here

7>echo "sentence" | tr -d W~ to delete specified characters using -d option. 8>tr -d W <<< "sentence" ~ to delete specified characters using -d option using a string here. 9>echo " sentence containing digits" | tr -d [:digit:]~to remove all the digits from string. 10>tr -d [:digit:] <<< "sentence containing digits" ~ to remove all the digits from string . 11>echo "sentence containing digits" | tr -cd [:digit:]~complement the sets using -c option . 12>tr -cd [:digit:] <<< "sentence containing digits" ~complement the sets using -c option

output:

akshaya@Akshayas-MacBook-Pro ~ % cat > file3.txt we were lab that is unix lab assignment we are doing working on system

{}

{ }{ }{ }{ }{ }{ }{ }{ }{ }{ }%

akshaya@Akshayas-MacBook-Pro ~ % cat file3.txt | tr [a-z][A-Z]
zsh: no matches found: [a-z]
akshaya@Akshayas-MacBook-Pro ~ % cat file3.txt | tr [a-z] [A-Z]zsh: no matches found: [a-z]
akshaya@Akshayas-MacBook-Pro ~ % cat file3.txt | tr "[lower:]" "[upper:]"

WE WERE LAB THAT IS UNIX LAB
ASSIGNMENT WE ARE DOING
WORKING ON SYSTEM

{}

{ }{ }{ }{ }{ }{ }{ }{ }{ }{ }%

akshaya@Akshayas-MacBook-Pro ~ % echo " welcome to unixlab" | tr ' ' '\n'

welcome
to
unix
lab

akshaya@Akshayas-MacBook-Pro ~ % tr '[' ']' < file3.txt > file4.txtakshaya@Akshayas-MacBook-Pro ~

% tr '[' ']' < file3.txt > file4.txt

```
akshaya@Akshayas-MacBook-Pro ~ % cat file4.txt we were lab that is unix lab  
assignment we are doing  
working on system  
{  
%  
akshaya@Akshayas-MacBook-Pro ~ % echo "welcome to unixlab" | tr -s " "  
welcome to unix lab  
akshaya@Akshayas-MacBook-Pro ~ % echo "welcome to unix lab" | tr-d"""  
welcometounixlab  
akshaya@Akshayas-MacBook-Pro ~ % echo "welcome to unix 422141" |tr-d" "  
welcometounix422141  
akshaya@Akshayas-MacBook-Pro ~ % echo " welcome to unix 422141" |tr-cd [:digit:]  
zsh: no matches found: [:digit:]  
akshaya@Akshayas-MacBook-Pro ~ % echo " welcome to unix 422141" |tr-cd '[:digit:]'  
akshaya@Akshayas-MacBook-Pro ~ %
```

4)pr command:

1>pr -k filename ~ we can print the content in k columns .

2>pr -d filename ~ to double paces input, reduces clutter -d option is used.

3>pr -n filename ~ to provide the number lines which helps in debugging the code -n option is used.
.4>pr --help ~ it gives the detail of all options of pr.

5>pr --version ~ to print the version number of command pr

output:

```
akshaya@Akshayas-MacBook-Pro ~ % ls -l example.txt
```

```
-rw-r--r-- 1 akshaya staff 48 Feb 18 21:53 example.txt akshaya@Akshayas-MacBook-Pro ~ % echo "This is  
line 1. This is line2. This is line 3." > example.txt  
fold -w 20 example.txt
```

This is line 1. This
is line 2. This is
line 3.

```
akshaya@Akshayas-MacBook-Pro ~ % awk '1; {print ""}' example.txtThis is line 1. This is line 2.
```

This is line 3.

5)paste command:

1>paste file1 file2 file 3 ~ without any option paste merges the files in parallel. The paste command writes corresponding lines from the files with tab as a delimiter on the terminal .

2>paste -d "|" file1 file2 file3 ~ it prints even if any character is specified. 3>paste -d "|,"
file1 file2 file3 ~ it prints even multi characters are specified.

4>paste -s file1 file2 file3 AND paste -s -d “.” file1 file2 file3 ~ we can merge the file in sequentially manner using the -s option. It reads all the lines from a single file and merges all these lines into a single line with each line separated by tab . and these single lines are separated by newline.

5>cat file1 | paste - - - (or) paste - - - < file~ the paste command can also be used to merge N consecutive lines from file into a single line.here N can be specified by specifying number hyphens(-) after paste.

6>cut -d “ “ -f 1 file1 | file2 file3 ~cut command is used with -f option for cutting out first field of state and output is pipelined with paste command having one filename and instead of second file name hyphen is specified (if hyphen is not specified the input from shell is not pasted)

7>cut -d “ “ -f 1 file1 | paste - file2 ~ ordering of pasting can be changed by altering the location of hyphen

output:

```
akshaya@Akshayas-MacBook-Pro ~ % clear
```

```
akshaya@Akshayas-MacBook-Pro ~ % cat > file6.txt a
```

```
b  
c  
d  
e  
f  
g  
h
```

```
akshaya@Akshayas-MacBook-Pro ~ % cat > file7.txt A
```

```
B  
C  
D  
E  
F  
G  
H%
```

```
akshaya@Akshayas-MacBook-Pro ~ % cat number cat: number: No such file or  
directory akshaya@Akshayas-MacBook-Pro ~ % cat > number 1
```

```
2  
3  
4  
5  
6  
7  
8%
```

```
akshaya@Akshayas-MacBook-Pro ~ % paste number file6.txt file7.txt
```

```
1 a A  
2 b B  
3 c C  
4 d D  
5 e E  
6 f F  
7 g G  
8 h H
```

```
akshaya@Akshayas-MacBook-Pro ~ % paste -d " |," number file6.txt file7.txt
```

```
1|a,A
```

2|b,B
3|c,C
4|d,D
5|e,E
6|f,F
7|g,G
8|h,H

akshaya@Akshayas-MacBook-Pro ~ % paste -d "|" number file6.txtfile7.txt

1|a,A
2|b,B
3|c,C
4|d,D
5|e,E
6|f,F
7|g,G
8|h,H

akshaya@Akshayas-MacBook-Pro ~ % paste -s "|" number file6.txtfile7.txt

paste: |: No such file or directory

1 2 3 4 5 6 7 8a b c h

A [REDACTED] % akshaya@Akshayas-MacBook-Pro~%paste < file6.txt

usage: paste [-s] [-d delimiters] file ... akshaya@Akshayas-MacBook-Pro ~ % cat file7.txt | paste

usage: paste [-s] [-d delimiters] file ... akshaya@Akshayas-MacBook-Pro ~ % cat file7.txt

A
B
C
D
E
F
G
H%

akshaya@Akshayas-MacBook-Pro ~ % cat file7.txt | paste--A B

C D
E F
G H

akshaya@Akshayas-MacBook-Pro ~ % cat file7.txt | paste - - A B

C D
E F
G H

akshaya@Akshayas-MacBook-Pro ~ % cut -d " " -f 1 file7.txt | pastenumber

1
2
3
4
5
6
7
8

akshaya@Akshayas-MacBook-Pro ~ % cat file7.txt | paste - - A B

C D
E F
G H

akshaya@Akshayas-MacBook-Pro ~ %

7. head command:

- Displays the first few lines of a file. Command used: head filename
- Display a specific number of lines: Command used: head -n 10 filename

output:

```
G H  
akshaya@Akshayas-MacBook-Pro ~ % cat file7.txt | paste - - A B  
C D  
E F  
G H  
akshaya@Akshayas-MacBook-Pro ~ % cut -d " " -f 1 file7.txt | pastenumber  
1  
2  
3  
4  
5  
6  
7  
8  
akshaya@Akshayas-MacBook-Pro ~ % cat file7.txt | paste - - A B  
C D  
E F  
G H  
akshaya@Akshayas-MacBook-Pro ~ %lear  
zsh: command not found: lear  
akshaya@Akshayas-MacBook-Pro ~ % clear  
  
akshaya@Akshayas-MacBook-Pro ~ % head file2.txt head: file2.txt: No such file or  
directory akshaya@Akshayas-MacBook-Pro ~ % head file6.txt a  
b  
c  
d  
e  
f  
g  
h  
akshaya@Akshayas-MacBook-Pro ~ % head new.txt unix lab  
roll no: 422141  
sectuon : A  
unix lab  
roll no: 422141  
section: A  
akshaya@Akshayas-MacBook-Pro ~ % head -n 2 new.txt unix lab  
roll no: 422141  
akshaya@Akshayas-MacBook-Pro ~ %
```

8.Tail

- Displays the last few lines of a file. Command used: tail filename
- Display a specific number of lines: Command used: tail -n 10 filename Follow the growth of a file (similar to tail -f): Command used: tail -f filename
output:

```
akshaya@Akshayas-MacBook-Pro ~ % head file2.txt head: file2.txt: No such file or
directory akshaya@Akshayas-MacBook-Pro ~ % head file6.txt a
b
c
d
e
f
g
h
```

```
akshaya@Akshayas-MacBook-Pro ~ % head new.txt unix lab
roll no: 422141
sectuon : A
unix lab
roll no: 422141
section: A
akshaya@Akshayas-MacBook-Pro ~ % head -n 2 new.txt unix lab
roll no: 422141
akshaya@Akshayas-MacBook-Pro ~ % clear
```

```
akshaya@Akshayas-MacBook-Pro ~ % tail new.txt unix lab
roll no: 422141
sectuon : A
unix lab
roll no: 422141
section: A
akshaya@Akshayas-MacBook-Pro ~ % tail -n 2 new.txt roll no: 422141
section: A
akshaya@Akshayas-MacBook-Pro ~ % tail -f new.txt unix lab
roll no: 422141
sectuon : A
unix lab
roll no: 422141
section: A
```

9.Sort

- Sort a file alphabetically: Command used: sort filename
- Sort a file numerically: Command used: sort -n filename
- Sort a file in reverse order: Command used: sort -r filename Sort a file and remove duplicate lines: Command used: sort -u filename

Sort a file based on a specific column (using space as the delimiter): Command used: sort -k filename

- Sort a file in a case-insensitive manner: Command used: sort -f filename
- Sort lines in memory for faster sorting: Command used: sort -S filename
- Sort based on the month abbreviation (e.g., Jan, Feb, Mar): Command used: sort -Mfilename

output:

```
Last login: Sun Feb 18 21:55:40 on ttys000 akshaya@Akshayas-MacBook-Pro ~ %
sort new.txt roll no: 422141
```

```
roll no: 422141
```

```
section: A
```

```
sectuon : A
```

```
unix lab
```

```
unix lab
```

```
akshaya@Akshayas-MacBook-Pro ~ % sort -n new.txt roll no: 422141
```

```
roll no: 422141
```

```
section: A
```

```
sectuon : A
```

```
unix lab
```

```
unix lab
```

```
akshaya@Akshayas-MacBook-Pro ~ % sort -r new.txt unix lab
```

```
unix lab
```

```
sectuon : A
```

```
section: A
```

```
roll no: 422141
```

```
roll no: 422141
```

```
akshaya@Akshayas-MacBook-Pro ~ % sort -u new.txt roll no: 422141
```

```
section: A
```

```
sectuon : A
```

```
unix lab
```

```
akshaya@Akshayas-MacBook-Pro ~ % sort -k new.txt sort: -k new.txt: Invalid argument
```

```
akshaya@Akshayas-MacBook-Pro ~ % sort -k 1 new.txt roll no: 422141
```

```
roll no: 422141
```

```
section: A
```

```
sectuon : A
```

```
unix lab
```

```
unix lab
```

```
akshaya@Akshayas-MacBook-Pro ~ % sort -k 10 new.txt roll no: 422141
```

```
roll no: 422141
```

```
section: A
```

sectuon : A
unix lab
unix lab
akshaya@Akshayas-MacBook-Pro ~ % sort -f new.txt roll no: 422141
roll no: 422141
section: A
sectuon : A
unix lab
unix lab
akshaya@Akshayas-MacBook-Pro ~ % sort -m new.txt unix lab
roll no: 422141
sectuon : A
unix lab
roll no: 422141
section: A

Name:Akshay chinnu
Roll number:422141
Sec:A

ASSIGNMENT:2

tar_output.txt:

```
awk.sh
sed.sh
tar.sh
awk.sh
sed.sh
tar.sh
awk_out.txt
file1.txt
file2.txt
sed_out.txt
```

tar code:

```
tar cvf file.tar *.sh
```

```
tar xvf file.tar
```

```
tar cvzf file.tar.gz *.txt
```

```
tar xvzf file.tar.gz
```

```
tar cvfj file.tar.tbz example.cpp
```

```
tar xvfj file.tar
```

```
tar xvf file.tar "file1" "file2"
```

```
tar czf file.tar | wc -c
```

```
tar tf file.tar
```

```
tar tvf file.tar | grep "text to find"
```

```
tar tvf file.tar filename
```

```
tar tvf file.tar
```

cpio_ouput.txt:

```
#create a cpio file
```

```
#extract a cpio file
```

```
#creating tar using cpio
```

```
#extract tar using cpio
```

```
#To create a *.tar archive with selected files
```

```
./hello1.txt  
./tar_out.txt  
./cpio_out.txt  
./hello2.txt  
./hello3.txt
```

```
#To only view *.tar archive file
```

```
./hello1.txt  
./tar_out.txt  
./cpio_out.txt  
./hello2.txt  
./hello3.txt
```

cpio code:

```
#!/bin/bash
```

```
echo "#create a cpio file"  
ls | cpio -ov > one.cpio
```

```
echo ""  
echo ""
```

```

echo "#extract a cpio file"
ls | cpio -iv < one.cpio

echo ""
echo ""

echo "#creating tar using cpio"
ls | cpio -ov -H tar > one.tar

echo ""
echo ""

echo "#extract tar using cpio"
cpio -iv -F one.tar

echo ""
echo ""

echo "#To create a *.tar archive with selected files"
find . -name "*.txt" | tar -cvf one.tar -T -

echo ""
echo ""

echo "#To only view *.tar archive file "
cpio -it < one.tar

```

sed_out.txt:

```

cat > file3.txt
s01 em1 10000 25
s02 em2 12000 24
s03 em3 11020 22
s04 em4 13000 23
s05 em5 19000 26
s06 em6 20000 25
s07 em7 25000 27
s08 em8 32000 28

cat > file3.txt
01 em1 10000 25
s02 em2 12000 24
s03 em3 11020 22
s04 em4 13000 23
s05 em5 19000 26
s06 em6 20000 25
s07 em7 25000 27
s08 em8 32000 28

cat > file3.txt
s01 em1 10000 21
s02 em2 12000 24
s03 em3 11020 22

```

```
s04 em4 13000 23  
s05 em5 19000 26  
s06 em6 20000 21  
s07 em7 21000 27  
s08 em8 32000 28
```

```
cat > file3.txt  
s02 em2 12000 24  
s03 em3 11020 22  
s04 em4 13000 23  
s05 em5 19000 26  
s06 em6 20000 25  
s07 em7 25000 27  
s08 em8 32000 28
```

```
cat > file3.txt  
s01 em1 10000 25  
s02 em2 12000 24  
s03 em3 11020 22  
s04 em4 13000 23  
s05 em5 19000 26  
s06 em6 20000 25  
s07 em7 25000 27  
s08 em8 32000 28  
cat > file3.txt  
s01 em1 10000 25  
s02 em2 12000 24
```

sed code:

```
cat file3.txt  
sed 's/s01/01/' file3.txt  
sed 's/25/21/g' file3.txt  
sed '2d' file3.txt  
sed '$d' file3.txt  
sed '1,4d' file3.txt  
sed '4,$d' file3.txt
```

awk_out.txt:

```
cat > file3.txt  
s01 em1 10000 25  
s02 em2 12000 24  
s03 em3 11020 22  
s04 em4 13000 23  
s05 em5 19000 26  
s06 em6 20000 25  
s07 em7 25000 27  
s08 em8 32000 28
```

```
cat file3.txt  
s01 10000  
s02 12000  
s03 11020  
s04 13000  
s05 19000  
s06 20000  
s07 25000  
s08 32000
```

```
142020  
14202  
at  
01  
02  
03  
04
```

```
05
06
07
08

file3.txt
25
24
22
23
26
25
27
28

senior
junior
junior
junior
junior
senior
senior
senior
senior
junior
0
625
576
484
529
676
625
729
784
0
```

awk code:

```
cat file3.txt
awk '{printf}' file3.txt
awk '{print $1,$3}' file3.txt
awk '{sum +=$3} END {print sum}' file3.txt
awk '{sum +=$3} END {print sum /NR}' file3.txt
awk '{print substr($1,2,3)}' file3.txt
awk '{print $NF}' file3.txt
awk '{ if ($3 > 15000) { print "senior"} else {print "junior"}}' file3.txt
awk 'function square(x) {return x*x} {print square($4) }' file3.txt
```

Assignment_3

Name:Akshay chinnu
Sec:A
Roll number:422141

N_Queens.txt:

STATIC AND DYNAMIC LINKING

ROLL NUMBERS : 422148 & 422141

SEC : A

//Functions.h

```
#ifndef FUNCTIONS_H
#define FUNCTIONS_H
#define MAX_SIZE 10
struct Stack {
    int items[MAX_SIZE];
    int top;
};
void initialize(struct Stack *s);
int isFull(struct Stack *s);
int isEmpty(struct Stack *s);
void push(struct Stack *s, int value);
int pop(struct Stack *s);
void printBoard(int board[MAX_SIZE][MAX_SIZE], int n);
int isSafe(int board[MAX_SIZE][MAX_SIZE], int row, int col, int n);
void solveNQueens(int n);
#endif
```

//push_pop.c

```
#include <stdio.h>
#include <stdlib.h>
#include "Functions.h"

void initialize(struct Stack *s) {
    s->top = -1;
```

```

}

int isFull(struct Stack *s) {
    return s->top == MAX_SIZE - 1;
}

int isEmpty(struct Stack *s) {
    return s->top == -1;
}

void push(struct Stack *s, int value) {
    if (isFull(s)) {
        printf("Stack Overflow\n");
        return;
    }
    s->items[++(s->top)] = value;
}

int pop(struct Stack *s) {
    if (isEmpty(s)) {
        printf("Stack Underflow\n");
        exit(1);
    }
    return s->items[(s->top)--];
}

//NQueens.c

#include <stdbool.h>
#include <stdio.h>
#include "Functions.h"
void printBoard(int board[MAX_SIZE][MAX_SIZE], int n) {
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            printf("%d ", board[i][j]);
        }
        printf("\n");
    }
    printf("\n");
}

int isSafe(int board[MAX_SIZE][MAX_SIZE], int row, int col, int n) {
    int i, j;
    for (i = 0; i < col; i++) {

```

```

        if (board[row][i]) {
            return 0;
        }
    }
    for (i = row, j = col; i >= 0 && j >= 0; i--, j--) {
        if (board[i][j]) {
            return 0;
        }
    }
    for (i = row, j = col; j >= 0 && i < n; i++, j--) {
        if (board[i][j]) {
            return 0;
        }
    }
    return 1;
}

void solveNQueens(int n) {
    int board[MAX_SIZE][MAX_SIZE] = {0};
    struct Stack positions;
    initialize(&positions);
    push(&positions, 0);
    while (!isEmpty(&positions)) {
        int col = pop(&positions);
        if (col == n) {
            printBoard(board, n);
            return;
        }
        bool placed = false;
        for (int i = 0; i < n; i++) {
            if (isSafe(board, i, col, n)) {
                board[i][col] = 1;
                push(&positions, col + 1);
                placed = true;
                break;
            }
        }
        if (!placed) {
            if (!isEmpty(&positions)) {
                int prev_col = pop(&positions);
                if (prev_col == n - 1) {
                    return;
                }
                for (int i = 0; i < n; i++) {

```

```

        if (board[i][prev_col] == 1) {
            board[i][prev_col] = 0;
            break;
        }
    }
    push(&positions, prev_col + 1);
}
}

printf("Solution does not exist\n");
}

//main.c

#include <stdio.h>
#include "Functions.h"

int main() {
    int n;
    printf("Enter no.of Queens : ");
    scanf("%d",&n);
    solveNQueens(n);
    return 0;
}

```

BUILD_AND_RUSH.sh:

```

#!/bin/bash

# Compile source files into object files
gcc -c -fPIC push_pop.c NQueens.c

# Check if object files were created successfully
if [ $? -ne 0 ]; then
    echo "Error: Failed to compile source files into object files"
    exit 1
fi

```

```

# Create static library
ar rcs libFunctions.a push_pop.o NQueens.o

# Check if static library was created successfully
if [ $? -ne 0 ]; then
    echo "Error: Failed to create the static library"
    exit 1
fi

# Create dynamic library
gcc -shared -o libFunctions.so push_pop.o NQueens.o

# Check if dynamic library was created successfully
if [ $? -ne 0 ]; then
    echo "Error: Failed to create the dynamic library"
    exit 1
fi

# Set LD_LIBRARY_PATH to include current directory
export LD_LIBRARY_PATH=$(pwd):$LD_LIBRARY_PATH

# Compile main program with static library
gcc main.c -L. -lFunctions -o main_static

# Check if main program with static library was compiled successfully
if [ $? -ne 0 ]; then
    echo "Error: Failed to compile the main program with static library"
    exit 1
fi

# Compile main program with dynamic library
gcc main.c -L. -lFunctions -o main_dynamic

# Check if main program with dynamic library was compiled
# successfully
if [ $? -ne 0 ]; then
    echo "Error: Failed to compile the main program with dynamic library"
    exit 1
fi

# Execute main programs
echo "Executing main program with static library..."
./main_static

```

```
echo "Executing main program with dynamic library..."  
./main_dynamic
```

```
echo "Compilation successful"
```

```
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/UNIX$ chmod +x Build_And_Run.sh  
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/UNIX$ ./Build_And_Run.sh  
Executing main program with static library...  
Enter no.of Queens : 5  
1 0 0 0 0  
0 0 0 1 0  
0 1 0 0 0  
0 0 0 0 1  
0 0 1 0 0  
  
Executing main program with dynamic library...  
Enter no.of Queens : 5  
1 0 0 0 0  
0 0 0 1 0  
0 1 0 0 0  
0 0 0 0 1  
0 0 1 0 0  
  
Compilation successful  
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/UNIX$ ls  
Build_And_Run.sh  libFunctions.a  main.c      main_static  NQueens.o  push_pop.o  week_6  
Functions.h       libFunctions.so  main_dynamic  NQueens.c  push_pop.c  week_5  
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/UNIX$ █
```

UNIX ASSIGNMENT:4
NAME: AKSHAY CHINNU
SECTION:A
ROLL NUMBER :422141

CODE:

DOUBLY_LINKED.H:

```
#include <stdio.h>

struct
node{ int
data;
struct node *prev;
struct node *next;
};

int init(struct node **head, struct node **tail);
int insert(struct node **head, struct node **tail, int data, int pos); int deletenode(struct
node **head, struct node **tail, int pos, int *data); int search(struct node **head, int
key, int*pos);

int traverseforward(struct node **head);
int traversebackward(struct node **tail);
int findsmallbig(struct node** head, int *big, int *small); }
```

DOUBLY_LINKED LIST.C

```
#include <stdio.h>
#include <stdlib.h>
#include "DOUBLY_LINKED.h"

int init(struct node **head,struct node **tail){
*head=NULL;
*tail=NULL;
return 1;
}

int insert(struct node **head, struct node **tail, int data, int pos){ struct node
*newnode=(struct node*)malloc(sizeof(struct node)); if (!newnode || pos<1)
return 0;
newnode->data=data;
if(*head==NULL){
if (pos==1){
newnode->next=NULL; newnode->prev=NULL;
*head=newnode
*tail=newnode;
return 1;
}
}
```

```

else return 0;
}
if (pos==1){
(*head)->prev=newnode;
newnode->next=*head;
*head=newnode;
newnode->prev=NULL;
return 1;
}
struct node *ptr=NULL;
ptr=*head;
for(int i=1;i<pos-1 &&
ptr!=NULL;i++){ ptr=ptr->next;
}
if (!ptr) return 0;
newnode->next=ptr->next;
newnode->prev=ptr;
ptr->next=newnode;
if ((newnode->next)==NULL) *tail=newnode;
else (newnode->next)->prev=newnode;
return 1;
}

int deletenode(struct node **head, struct node **tail, int *pos, int *key) {
if (*head==NULL || pos<1)
return 0;

struct node *iter=*head;
int i=1;
while (iter!=NULL &&
i<pos){ iter=iter->next;
i+=1;
}

if (!iter) return 0;
*key=iter->data;
if (iter==*head){
*head=(*head)->next;
(*head)->prev=NULL;
free(iter);
return 1;
}
if (iter==*tail){
*tail=(*tail)->prev;
(*tail)->next=NULL;
free(iter);
return 1;
}
(iter->next)->prev=iter->prev;
(iter->prev)->next=iter->next;
free(iter);
return 1; }

int search(struct node **head, int key, int *pos){ if
(*head==NULL) return 0;

struct node *iter=*head;

```

```

int i=1;
while (iter!=NULL && iter->data!=key){
iter=iter->next;

i+=1;

if (iter==NULL) return 0;
*pos=i;
return 1;
}

int traverseforward(struct node **head){ if
(*head==NULL){
printf("NULL \n");
return 0;
}
struct node *iter=*head;
while (iter){
printf("%d-->",(iter->data));
iter=iter->next;
}
printf("NULL \n"); return 1;
}

int traversebackward(struct node **tail){ if (*tail==NULL){
printf("NULL \n"); return 0;
}
struct node *iter=*tail; while (iter){
printf("%d-->",(iter->data)); iter=iter->prev;
}
printf("NULL \n"); return 1;
}

int findsmallbig(struct node **head, int *big, int*small){ if
(*head==NULL)
return 0;

struct node *iter=*head;
int tempsmall=(*head)->data;
int tempbig=tempsmall;

while (iter!=NULL){
if (tempbig<(iter->data)) tempbig=iter->data; if
(tempsmall>(iter->data))
tempsmall=iter->data;
iter=iter->next;

}
*big=tempbig;{
*small=tempsmall; return 1;
}

int main(){
struct node *head=NULL; struct node *tail=NULL; init(&head, &tail);

int length;
printf("Enter no of elements to insert in Doubly LL: ");

```

```

scanf("%d",&length);
for(int i=1;
    i<=length;i++){ int elem;
printf("Enter element: ");
scanf("%d",&elem);
insert(&head,&tail,elem,i);
}

printf("The current linked list: \n"); traverseforward(&head);

int elem,pos;
printf("Enter element to insert at specific position: "); scanf("%d %d",&elem,&pos);
insert(&head,&tail,elem,pos);
printf("The current linked list: \n"); traverseforward(&head); printf("Traversing in

backward direction: \n"); traversebackward(&tail); printf("Deleting element: \n");

printf("Enter position of element to delete: "); scanf("%d",&pos); deletenode(&head,
&tail,pos,&elem); printf("The current linked list: \n"); traverseforward(&head);
printf("Deleted element: %d \n",elem);

printf("Enter element to search: ");
scanf("%d",&elem);
search(&head, elem, &pos);
printf("Position of element: %d \n", pos);

int big,small;
findsmallbig(&head,&big,&small);
printf("The largest and smallest elements are: %d %d \n", big, small); return 0;

}

```

Output:

```
student@at-HP-ProDesk-600-G4-MT:~/422141$ gcc -g double.c
student@al-HP-ProDesk-600-G4-MT: ~/422141$ gdb ./a.out
GNU gdb (Ubuntu 9.2-0ubuntu1~20.04.1) 9.2
Copyright (C) 2020 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type
"show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu"
Type "show configuration" for configuration details
Follow link (cmd + click)
For bug reporting instructions, please see: http://www.gnu.org/software/gdb/bugs/.
Find the GDB manual and other documentation resources online at:
<http://www.gnu.org/software/gdb/documentation/>.
For help, type "help".
Type "apropos word" to search for commands related to "word"
...
Reading symbols from ./a.out... (gdb) run
Starting program: /home/student/422141/a.out
Enter no of elements to insert in Doubly LL: 3
Enter element: 1
Enter element: 2
Enter element: 3
```

The current linked list:

```
Program received signal SIGSEGV, Segmentation fault.
0x000055555555559a in traverseforward (head=0x7fffffffde68) at double.c:89
89      printf("%d-->",(iter->data));
(gdb) list
84      printf("NULL \n");
85      return 0;
86  }
87  struct node *iter=*head;
88  while (iter || iter==NULL){
89      printf("%d-->",(iter->data));
90      iter=iter->next;
91  }
92  printf("NULL \n");
93  return 1;
(gdb) break 88
Breakpoint 1 at 0x555555555594: file double.c, line 88.
(gdb) break 89
Breakpoint 2 at 0x555555555596: file double.c, line 89.
(gdb) break 90
```

```
Enter no of elements to insert in Doubly LL: 3
Enter element: 1
Enter element: 2
Enter element: 3
The current linked list:

Breakpoint 5, traverseforward (head=0x7fffffffde80) at double.c:82
82     int traverseforward(struct node **head){
(gdb) print traverseforward
$1 = {int (struct node **)} 0x55555555555a <traverseforward>
(gdb) next
83     if (*head==NULL){
(gdb) print head
$2 = (struct node **) 0x7fffffffde68
(gdb) next
87     struct node *iter=*head;
(gdb) print iter
$3 = (struct node *) 0x7fffffffdf70
(gdb) next

Breakpoint 1, traverseforward (head=0x7fffffffde68) at double.c:88
88     while (iter || iter==NULL){
(gdb) continue
Continuing.

Breakpoint 2, traverseforward (head=0x7fffffffde68) at double.c:89
89     printf("%d-->",(iter->data));
(gdb) next

Breakpoint 3, traverseforward (head=0x7fffffffde68) at double.c:90
90     iter=iter->next;
(gdb) next
88     while (iter || iter==NULL){
(gdb) print iter
$4 = (struct node *) 0x555555559ae0
(gdb) continue
```

```
Breakpoint 2, traverseforward (head=0x7fffffffde68) at double.c:89
89      printf("%d-->",(iter->data));
(gdb) next

Breakpoint 3, traverseforward (head=0x7fffffffde68) at double.c:90
90      iter=iter->next;
(gdb) next
88      while (iter || iter==NULL){
(gdb) print iter
$4 = (struct node *) 0x555555559ae0
(gdb) continue
Continuing.

Breakpoint 2, traverseforward (head=0x7fffffffde68) at double.c:89
89      printf("%d-->",(iter->data));
(gdb) next

Breakpoint 3, traverseforward (head=0x7fffffffde68) at double.c:90
90      iter=iter->next;
(gdb) next
88      while (iter || iter==NULL){
(gdb) next

Breakpoint 2, traverseforward (head=0x7fffffffde68) at double.c:89
89      printf("%d-->",(iter->data));
(gdb) next

Breakpoint 3, traverseforward (head=0x7fffffffde68) at double.c:90
90      iter=iter->next;
(gdb) next
88      while (iter || iter==NULL){
(gdb) next

Breakpoint 2, traverseforward (head=0x7fffffffde68) at double.c:89
89      printf("%d-->",(iter->data));
(gdb) next

Program received signal SIGSEGV, Segmentation fault.
0x0000555555559a in traverseforward (head=0x7fffffffde68) at double.c:89
89      printf("%d-->",(iter->data));
(gdb) next

Program terminated with signal SIGSEGV, Segmentation fault.
The program no longer exists.
(gdb) []
```

```

0x000000000000139b <+5>:    mov    %rsp,%rbp
0x000000000000139e <+8>:    sub    $0x20,%rsp
0x00000000000013a2 <+12>:   mov    %fs:0x28,%rax
0x00000000000013ab <+21>:   mov    %rax,-0x8(%rbp)
0x00000000000013af <+25>:   xor    %eax,%eax
0x00000000000013b1 <+27>:   lea    0xc58(%rip),%rax      # 0x2010
0x00000000000013b8 <+34>:   mov    %rax,%rdi
0x00000000000013bb <+37>:   mov    $0x0,%eax
0x00000000000013c0 <+42>:   call   0x1090 <printf@plt>
0x00000000000013c5 <+47>:   lea    -0x1c(%rbp),%rax
0x00000000000013c9 <+51>:   mov    %rax,%rsi
0x00000000000013cc <+54>:   lea    0xc62(%rip),%rax      # 0x2035
0x00000000000013d3 <+61>:   mov    %rax,%rdi
0x00000000000013d6 <+64>:   mov    $0x0,%eax
0x00000000000013d9 <+69>:   call   0x10b0 <_isoc99_scanf@plt>
0x00000000000013e0 <+74>:   movq   $0x0,-0x10(%rbp)
0x00000000000013e8 <+82>:   jmp    0x1420 <main+148>
0x00000000000013ea <+84>:   lea    0xc47(%rip),%rax      # 0x2030
0x00000000000013f1 <+91>:   mov    %rax,%rdi
0x00000000000013f4 <+94>:   mov    $0x0,%eax
0x00000000000013f9 <+99>:   call   0x1090 <printf@plt>
0x00000000000013fa <+104>:  lea    -0x18(%rbp),%rax
0x0000000000001402 <+108>:  mov    %rax,%rsi
0x0000000000001405 <+111>:  lea    0xc29(%rip),%rax      # 0x2035
0x000000000000140c <+118>:  mov    %rax,%rdi
0x000000000000140f <+121>:  mov    $0x0,%eax
0x0000000000001414 <+126>:  call   0x10b0 <_isoc99_scanf@plt>
0x0000000000001419 <+131>:  mov    -0x18(%rbp),%edx
0x000000000000141c <+134>:  lea    -0x10(%rbp),%rax
0x0000000000001420 <+138>:  mov    %edx,%rsi
0x0000000000001422 <+140>:  mov    %rax,%rdi
0x0000000000001425 <+143>:  call   0x11a9 <insertnode>
0x0000000000001428 <+148>:  mov    -0x1c(%rbp),%eax
0x000000000000142d <+151>:  lea    -0x1(%rax),%edx
0x0000000000001430 <+154>:  mov    %edx,-0x1c(%rbp)
0x0000000000001433 <+157>:  test   %eax,%eax
0x0000000000001435 <+159>:  jne    0x138a <main+84>
0x0000000000001437 <+161>:  lea    0xc12(%rip),%rax      # 0x2050
0x000000000000143d <+168>:  mov    %rax,%rdi
0x0000000000001441 <+171>:  mov    $0x0,%eax
0x0000000000001440 <+176>:  call   0x1090 <printf@plt>
0x000000000000144b <+181>:  lea    -0x18(%rbp),%rax
0x000000000000144f <+185>:  mov    %rax,%rsi
0x0000000000001452 <+188>:  lea    0xbdc(%rip),%rax      # 0x2035
0x0000000000001459 <+195>:  mov    %rax,%rdi

```

-Type <RET> for more, q to quit, c to continue without paging--□

Code:

```
#include <stdio.h>
#include <stdlib.h>
```

```
struct
node{ int
data;
struct node *next;

};

struct node *head;
```

```
int initList(struct node **head){
*head=NULL;
return 1;
}
```

```

int search(struct node **head, int data, struct node
**ptrToKey, int *pos){
if (*head==NULL) return 0;
*pos=1;
struct node *ptr=*head;
for (;ptr!=NULL && ptr->data!=data;ptr=ptr->next){
*pos=(*pos)+1;

}
*ptrToKey=ptr;
if (!ptr) return 0;
return 1;
}

int insert(struct node **head, int position, int data){
struct node *newnode=(struct node*)malloc(sizeof(struct node));
if (newnode==NULL)
return 0;
newnode->data=data; if
(position==1){ newnode->next=*head;
*head = newnode;
return 1;
}

```

//To ensure there are no duplicate insertions, we conduct a search to verify whether the provided data already exists within the linked list.

```

struct node *ptrToKey=NULL;
int pos=0;
if (!search(head, data,&ptrToKey, &pos))
{
struct node *ptr=*head;
for (int i=1; i<position-1 && ptr!=NULL;i++) ptr=ptr->next;

if (ptr==NULL)
return 0;
else{
newnode->next=ptr->next;
ptr->next=newnode;
return 1;
}
}
else{

printf("Element already present in address: %p
\n",ptrToKey);
return 0;

}

int traverse(struct node *head){ if
(!head){ printf("NULL \n"); return 1;
}
for (struct node *ptr=head;ptr!=NULL;ptr=ptr->next) printf("%d -->",ptr->data); printf("NULL
\n"); return 1;
}
int kFromLast(struct node *head, int k ,int *data)

```

```

{
if(!head)
return 0;
struct node *fast=head; struct node *slow=NULL;
int i=1;
while(fast!=NULL &&
i<=k){ fast=fast->next;
i++;
}
if(fast==NULL && i<k)
return 0;
slow=head;
while(slow!=NULL){
slow=slow->next;
fast=fast->next;
}
*data=slow->data;
return 1;
}
int main(){
struct node *head; initList(&head);
int n;
printf("Enter no of nodes you want to enter data: ");
scanf("%d",&n);
int pos=1; while (n--
){ int data;
printf("\nEnter data: ");
scanf("%d",&data);
if (!insert(&head,pos++,data))
return 0;
}
printf("\nThe current linked list is:\n"); traverse(head);
int k, data;
printf("Enter kth position from last to find node data: "); scanf("%d", &k);
kFromLast(head, k, &data); printf("Data: %d\n",data); return 0; }

```

Output:

```
AKSHAY@AKSHAY:~/student$ gcc -g linked.c
AKSHAY@AKSHAY:~/student$ ./a.out
Enter no of nodes you want to enter data: 4

Enter data: 1

Enter data: 2

Enter data: 3

Enter data: 33

The current linked list is:
1 -->2 -->3 -->33 -->NULL
Enter kth position from last to find node data: 2
Segmentation fault

Enter no of nodes you want to enter data: 4

Enter data: 1

Enter data: 2

Enter data: 3

Enter data: 33

The current linked list is:
1 -->2 -->3 -->33 -->NULL
Enter kth position from last to find node data: 2

Program received signal SIGSEGV, Segmentation fault.
0x0000555555554bb in kFromLast (head=0x555555559ac0, k=2, data=0x7fffffff158) at linked.c:89
89          fast=fast->next;
(gdb) break 76
Breakpoint 1 at 0x55555555442: file linked.c, line 76.
(gdb) break 81
Breakpoint 2 at 0x5555555546a: file linked.c, line 81.
(gdb) break 87
```

```
Breakpoint 3 at 0x5555555554a9: file linked.c, line 87.
(gdb) break 88
Breakpoint 4 at 0x5555555554ab: file linked.c, line 88.
(gdb) break 89
Breakpoint 5 at 0x5555555554b7: file linked.c, line 89.
(gdb) break 117
Breakpoint 6 at 0x5555555555ea: file linked.c, line 117.
(gdb) run
The program being debugged has been started already.
Start it from the beginning? (y or n) y
Starting program: /home/AKSHAY/student/a.out
[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Enter no of nodes you want to enter data: 4

Enter data: 1
Enter data: 2
Enter data: 3
Enter data: 33

The current linked list is:
1 -->2 -->3 -->33 -->NULL
Enter kth position from last to find node data: 2

Breakpoint 6, main () at linked.c:117
117          kFromLast(head, k, &data);
(gdb) print head
$1 = (struct node *) 0x555555559ac0
(gdb) print k
$2 = 2
(gdb) print data
$3 = 33
(gdb) next

Breakpoint 1, kFromLast (head=0x555555559ac0, k=2, data=0x7fffffff158) at linked.c:76
76          if(!head) return 0;
```

```
(gdb) next
77          struct node *fast=head;
(gdb) print fast
$4 = (struct node *) 0x7fffffff288
(gdb) print head
$5 = (struct node *) 0x5555555559ac0
(gdb) next
78          struct node *slow=NULL;
(gdb) next
79          int i=1;
(gdb) next

Breakpoint 2, kFromLast (head=0x5555555559ac0, k=2, data=0x7fffffff158) at linked.c:81
81          while(fast!=NULL && i<=k){
(gdb) next\
82          fast=fast->next;
(gdb) next
83          i++;
(gdb) next
81          while(fast!=NULL && i<=k){
(gdb) next
82          fast=fast->next;
(gdb) next
83          i++;
(gdb) next
81          while(fast!=NULL && i<=k){
(gdb) next
85          if(fast==NULL && i<k) return 0;
(gdb) next
86          slow=head;
(gdb) next

Breakpoint 3, kFromLast (head=0x5555555559ac0, k=2, data=0x7fffffff158) at linked.c:87
87          while(slow!=NULL){
(gdb) next

Breakpoint 4, kFromLast (head=0x5555555559ac0, k=2, data=0x7fffffff158) at linked.c:88
88          slow=slow->next;
(gdb) next
```

```
Breakpoint 5, kFromLast (head=0x555555559ac0, k=2, data=0x7fffffff158) at linked.c:89
89                      fast=fast->next;
(gdb) next
87              while(slow!=NULL){
(gdb) next

Breakpoint 4, kFromLast (head=0x555555559ac0, k=2, data=0x7fffffff158) at linked.c:88
88                      slow=slow->next;
(gdb) next

Breakpoint 5, kFromLast (head=0x555555559ac0, k=2, data=0x7fffffff158) at linked.c:89
89                      fast=fast->next;
(gdb) next
87              while(slow!=NULL){
(gdb) next

Breakpoint 4, kFromLast (head=0x555555559ac0, k=2, data=0x7fffffff158) at linked.c:88
88                      slow=slow->next;
(gdb) next

Breakpoint 5, kFromLast (head=0x555555559ac0, k=2, data=0x7fffffff158) at linked.c:89
89                      fast=fast->next;
(gdb) next

Program received signal SIGSEGV, Segmentation fault.
0x0000555555554bb in kFromLast (head=0x555555559ac0, k=2, data=0x7fffffff158) at linked.c:89
89                      fast=fast->next;
(gdb) next

Program terminated with signal SIGSEGV, Segmentation fault.
The program no longer exists.
(gdb) disassemble main
Dump of assembler code for function main:
0x0000555555554dd <+0>:    endbr64
0x0000555555554e1 <+4>:    push   %rbp
0x0000555555554e2 <+5>:    mov    %rsp,%rbp
0x0000555555554e5 <+8>:    sub    $0x20,%rsp
0x0000555555554e9 <+12>:   mov    %fs:0x28,%rax
0x0000555555554f2 <+21>:   mov    %rax,-0x8(%rbp)
```

```
Dump of assembler code for function main:
```

```
0x00005555555554f6 <+25>: xor    %eax,%eax
0x00005555555554f8 <+27>: lea    -0x10(%rbp),%rax
0x00005555555554fc <+31>: mov    %rax,%rdi
0x00005555555554ff <+34>: call   0x55555555551c9 <initList>
0x0000555555555504 <+39>: lea    0xb35(%rip),%rax      # 0x555555556040
0x000055555555550b <+46>: mov    %rax,%rdi
0x000055555555550e <+49>: mov    $0x0,%eax
0x0000555555555513 <+54>: call   0x55555555550b0 <printf@plt>
0x0000555555555518 <+59>: lea    -0x20(%rbp),%rax
0x000055555555551c <+63>: mov    %rax,%rsi
0x000055555555551f <+66>: lea    0xb45(%rip),%rax      # 0x55555555606b
0x0000555555555526 <+73>: mov    %rax,%rdi
0x0000555555555529 <+76>: mov    $0x0,%eax
0x000055555555552e <+81>: call   0x55555555550d0 <__isoc99_scanf@plt>
0x0000555555555533 <+86>: movl  $0x1,-0x14(%rbp)
0x000055555555553a <+93>: jmp   0x555555555593 <main+182>
0x000055555555553c <+95>: lea    0xb2b(%rip),%rax      # 0x55555555606e
0x0000555555555543 <+102>: mov    %rax,%rdi
0x0000555555555546 <+105>: mov    $0x0,%eax
0x000055555555554b <+110>: call   0x55555555550b0 <printf@plt>
0x0000555555555550 <+115>: lea    -0x18(%rbp),%rax
0x0000555555555554 <+119>: mov    %rax,%rsi
0x0000555555555557 <+122>: lea    0xb0d(%rip),%rax      # 0x55555555606b
0x000055555555555e <+129>: mov    %rax,%rdi
0x0000555555555561 <+132>: mov    $0x0,%eax
0x0000555555555566 <+137>: call   0x55555555550d0 <__isoc99_scanf@plt>
0x000055555555556b <+142>: mov    -0x18(%rbp),%edx
0x000055555555556e <+145>: mov    -0x14(%rbp),%eax
```

```
--Type <RET> for more, q to quit, c to continue without paging----
```

UNIX ASSIGNMENT :5

NAME :AKSHAY CHINNU

SECTION:A

ROLL NUMBER:422141

QUESTIONS:

- 1. Using SSH command execute the three programs on two different machines.**

code:

```
student@el-HP-ProDesk-400-04-MT: ~$ ssh student@172.00.13.31
The authenticity of host '172.00.13.31 (172.00.13.31)' can't be established.
ECDSA key fingerprint is SHA256:HiuIVW4HbQ0Q4192304HIn5sA2o/5Te8TTe3X0Q2U.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes Warning: Permanently added '172.00.13.31' (ECDSA) to the list of known hosts.
student@el-HP-ProDesk-400-04-MT's password:
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.8.0-59-generic x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

637 updates can be applied immediately.
466 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

New release '22.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Wed Mar 28 16:56:01 2024 from 172.00.1.205
student@el-HP-ProDesk-400-04-MT: ~$ cd student -4221415
student@el-HP-ProDesk-400-04-MT:~/student-4221415$ gcc selectionsort.c student@el-HP-ProDesk-400-04-MT:~/student-4221415 $ ./a.out
2
4
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63
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65
66
67
68
69
70
71
72
73
74
75
76
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78
79
79
student@el-HP-ProDesk-400-04-MT: ~/student-4221415$ gcc hashtable.c hashtable.c: In function 'insert': hashtable.c: 13:24:
error: expected ',' before '}' token
13 |     while(table[iIndex].key != 1H
|     |
student@el-HP-ProDesk-400-04-MT: ~/student-4221415$ gcc hello.c student@el-HP-ProDesk-400-04-MT:~/student-4221415 $ ./a.out
Hello, world!
student@el-HP-ProDesk-400-04-MT: ~/student-4221415$ gcc evenodd.c student@el-HP-ProDesk-400-04-MT:~/student-4221415 $ ./a.out
Enter an integer: 6
the number 6 is even
student@el-HP-ProDesk-400-04-MT: ~/student-4221415$
```

```
student@el-HP-ProDesk-400-04-MT: ~$ ssh student@172.00.13.31
The authenticity of host '172.00.13.31 (172.00.13.31)' can't be established.
ECDSA key fingerprint is SHA256:HiuIVW4HbQ0Q4192304HIn5sA2o/5Te8TTe3X0Q2U.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes Warning: Permanently added '172.00.13.31' (ECDSA) to the list of known hosts.
student@172.00.13.31's password:
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.8.0-59-generic x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

637 updates can be applied immediately.
466 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

New release '22.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Wed Mar 28 16:33:36 2024 from 172.00.1.206
student@el-HP-ProDesk-400-04-MT: ~$ ls
al.py
422143-antlr
Client_arp.class
Client_arp.java
4221289
question7.py*
Clientarp.java
4221289 question7.py*
Clientarp
422284
Clientarp.class
4222236.py
clientarp.java
abc.py
code
add.pl
maine.h
AI_assign_4.py
maine.java
AIload_gt.py
src.class
src.java
src.out append.pl
CGO.py
demos_lab3.
_demos.
demos_lab3.sql
assign_5
Desktop
assign_5.hi
```

2.Create a project under CVS/git repository and record multiple versions/branches and practice merging of branches (with a batch of 2 members) using gitbash commands and upload all your previous lab tasks to this repository .

code:

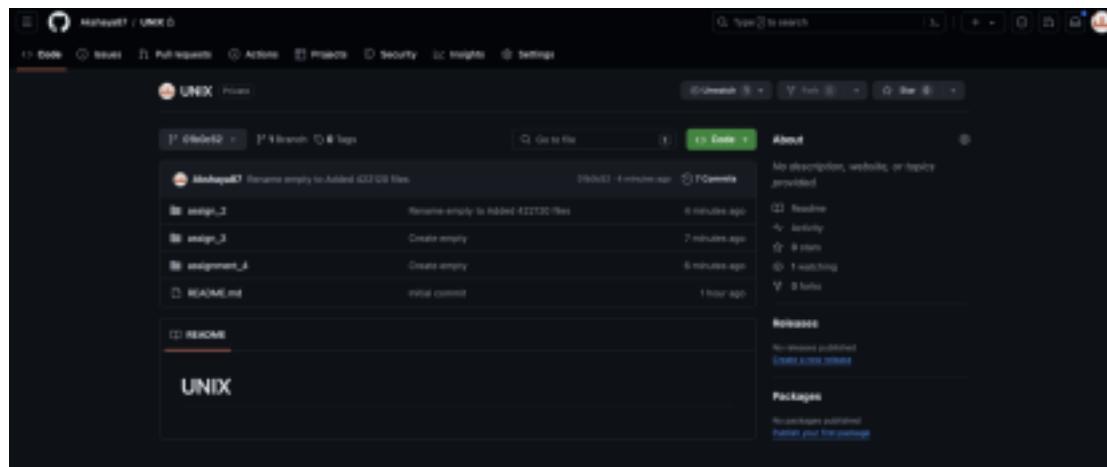
```
student@ai-HP-ProDesk-600-G4-NT:~/Desktop$ cd Desktop student@at-HP-ProDesk-600-G4-NT: ~/Desktop$ ls  
422141-py BitStuffing.java  
UNIX  
student@at-HP-ProDesk-600-G4-NT:~/Desktop$ cd UNIX  
student@at-HP-ProDesk-600-G4-NT:~/Desktop/UNIX$ git status  
  
On branch master  
  
No commits yet  
  
nothing to commit (create/copy files and use "git add" to track)  
student@at-HP-ProDesk-600-G4-NT:~/Desktop/UNIX$ git checkout -b "branch422141"  
Switched to a new branch 'branch422141'  
student@at-HP-ProDesk-600-G4-NT:~/Desktop/UNIX$ git status  
On branch branch422141  
  
No commits yet  
  
Untracked files:  
(use "git add <file>..." to include in what will be committed)  
Assignment2/  
Assignment3/  
Assignment 4/  
nothing added to commit but untracked files present (use "git add" to track)  
student@at-HP-ProDesk-600-G4-NT:~/Desktop/UNIX$ git add *  
student@ai-HP-ProDesk-600-G4-NT:~/Desktop/UNIX$ git commit -m "Added 422141 files"  
[branch422141 (root-commit) e9c387] Added 422141 files  
12 files changed, 429 insertions(+)  
create mode 100644 Assignment2/awk.sh  
create mode 100644 Assignment2/awk.txt  
create mode 100644 Assignment2/cpio.sh  
create mode 100644 Assignment2/cpio_out.txt  
create mode 100644 Assignment2/sed.sh  
create mode 100644 Assignment2/sed.txt  
create mode 100644 Assignment2/tar.sh  
create mode 100644 Assignment2/tarout.txt  
create mode 100644 Assignment3/Build _And_Run.sh  
create mode 100644 Assignment/Queens2.txt  
create mode 100644 Assignment3/unix.jpg  
create mode 100644 Assignment/UNIX ASSIGNMENT.pdf  
student@at-HP-ProDesk-600-G4-NT:~/Desktop/UNIX$ git push origin branch422141  
Username for 'https://github.com': ^C  
student@at-HP-ProDesk-600-G4-NT:~/Desktop/UNIX$ git remote -v origin  
https://github.com/UNIX.git (fetch)  
origin https://github.com/Akshaya87/UNIX (push)
```

```

create mode 100644 Assignment3/unix.jpg
create mode 100644 Assignment7/UNIX ASSESSMENT4.pdf
student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ git push origin branch422141
Username for 'https://github.com': v02
student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ git remote set-url origin https://github.com/Akshaya07/UNIX.git (fetch)
git@github.com:warning: https://github.com/Akshaya07/UNIX.git (push)
student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ git remote set-url https://gh_E3bafED2kuAGNx84HSTC6U9qdsl0dc1Nbeuf@github.com/D-Akshaya07/UNIX
usage: git remote set-url [-push] <name> <newurl> [<oldurl>]
git remote set-url <name>
  --add <name> <newurl>
  --delete <name>
  --edit <name> <newurl>
  --push <name> <newurl>
  --add <name> <newurl>
  --delete <name>

student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ git remote set-url origin https://gh_E3bafED2kuAGNx84HSTC6U9qdsl0dc1Nbeuf@github.com/Akshaya07/UNIX.git/
student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ git push origin branch422141
Enumerating objects: 17, done.
Counting objects: 100% (17/17), done.
Delta compression using up to 12 threads
Compressing objects: 100% (16/16), done.
Writing objects: 100% (16/16), 5.28 MiB | 64.00 KiB/s, done.
Total 17 (delta 0), reused 0 (delta 0) Resolving deltas: 100% (1/1), done.
To https://github.com/Akshaya07/UNIX.git/
 * [new branch] branch422141 -> branch422141
student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ git add .
student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ git commit -m "Added 422141 Assignment1"
[branch422141 6720006] Added 422141 Assignment1
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 First422141.pdf
student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ git push origin branch422141
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 12 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 486.43 KiB | 29.40 MiB/s, done.
Total 3 (delta 0), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/Akshaya07/UNIX.git/ +refs/heads/branch422141: -> branch422141
student@at-HP-ProDesk-600-04-MT:~/Desktop/UNIX$ 

```



Name:Akshay chinnu

Sec: A

Roll number:422141

Assignment:6

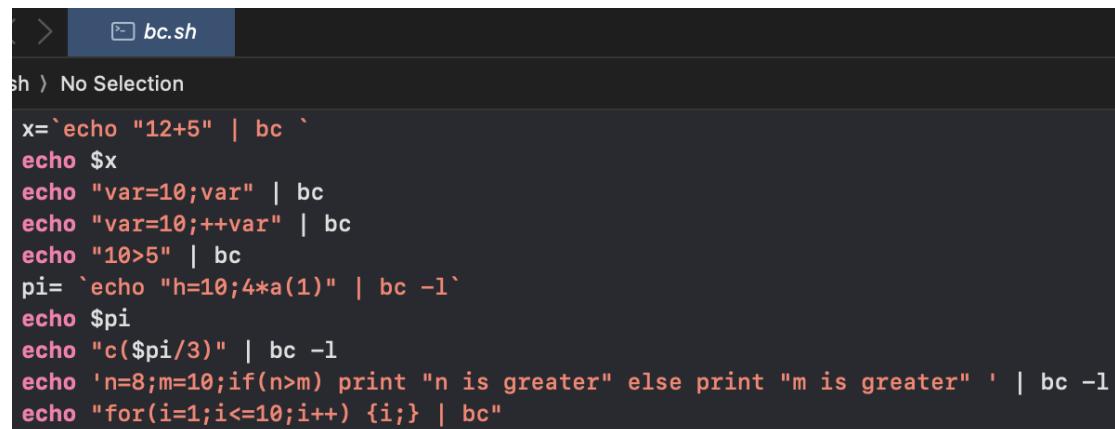
Question:

Write shell script for

commands : bc,comm,chown,chgrp,cron,dd,diff,finger,find,ftp,lock,ln,lp,lpstat,mesg .

1) bc

Code:



```
x=`echo "12+5" | bc `
echo $x
echo "var=10;var" | bc
echo "var=10;++var" | bc
echo "10>5" | bc
pi=`echo "h=10;4*a(1)" | bc -l`
echo $pi
echo "c($pi/3)" | bc -l
echo 'n=8;m=10;if(n>m) print "n is greater" else print "m is greater"' | bc -l
echo "for(i=1;i<=10;i++) {i;}" | bc"
```

Output:

```
< > bc.sh
sh > No Selection

Akshay@Akshay-VirtualBox:~$ cd Desktop
Akshay@Akshay-VirtualBox:~/Desktop$ cd assignment
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ chmod +x bc.sh
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash bc.sh
bash: bc.sh: Permission denied
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash bc.sh
19
12
16
6
bc.sh: line 6: 5.2456776535879323844: command not found

(standard_in) 1: syntax error
m is greaterfor (i=1;i<=10; i++) {i;} | bc
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bc -q bctest.txt
8
29
29|
```

2) comm

code:

```
> comm.sh
m.sh > No Selection

comm f1.txt f2.txt
comm -1 f1.txt f2.txt
comm --check-order f1.txt f2.txt
comm --nocheck-order f1.txt f2.txt
```

output:

```
comm.sh > comm.sh  
nm.sh > No Selection  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash comm.sh  
sumanth newton  
comm: f2 is not in sorted order  
tarun  
Akshay  
comm: f1 is not in sorted order sushanth tarun  
comm: input is not in sorted order sumanth newton  
comm: f2 is not in sorted order tarun  
comm: f1 is not in sorted order comm: input is not in sorted order  
sumanth newton  
comm: f2 is not in sorted order  
sumanth newton tarun  
Akshay sushanth tarun
```

f1.txt:

Akshay

sushanth

tarun

f2.txt:

sumanth

newton

tarun

3) chown

code:

```
chown.sh > chown.sh  
wn.sh > No Selection  
chown -c Akshay f1.txt  
ls -l f1.txt  
chown -v Akshay f2.txt  
ls -l f2.txt  
chown -f Akshay comm.sh
```

OUTPUT:

```
> chown.sh
wn.sh > No Selection
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ chmod +x chown.sh
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash chown.sh
-rw-rw-r-- 1 Akshay Akshay 28 Mar 30 20:19 f1.txt
ownership of 'f2.txt' retained as Akshay
-rw-rw-r-- 1 Akshay Akshay 28 Mar 29 38:11 f2.txt
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ |
```

4) chgrp

code:

```
> chgrp.sh
rp.sh > No Selection
chown :group1 f1.txt
chown Akshay:group1 cron.sh
chown --from=:group1 group2 cron.sh
chown --references=f1.txt bctest.sh
chgrp group1 f1.txt
chgrp -R group1 example
chgrp -c group1 f2.txt
chgrp -f group2 f2.txt
chgrp -v group3 f2.txt
```

output:

```
< > [ chgrp.sh ] grp.sh > No Selection
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash chgrp.sh
chown: changing group of 'f1.txt': Operation not permitted

chown: invalid user see coon.s: peration not permitted
chown: unrecognized option
'--references=f1.txt'
Try 'chown --help' for more information.

chgrp: changing group of 'f1.txt': Operation not permitted
chgrp: changing group of 'example': Operation not permitted
chgrp: changing group of 'f2.txt': Operation not permitted
chgrp: changing group of 'f2.txt': Operation not permitted
failed to change group of 'f2.txt' from Akshay to group3

Akshay@Akshay-VirtualBox:~/Desktop/assignment$ sudo bash chgrp.sh
chown: invalid user: 'group2'

chown: unrecognized option
'--references=f1.txt'
Try 'chown --help' for more information.

changed group of 'f2.txt' from Akshay to group1
changed group of 'f2.txt' from group2 to group3

Akshay@Akshay-VirtualBox:~/Desktop/assignment$
```

5) cron

code:

```
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ crontab -e
no crontab for Akshay - using an empty one
Select an editor. To change later, run 'select-editor'.
1. /bin/nano
--- easiest
2. /usr/bin/vim.tiny
3. /bin/ed
Choose 1-3 [1]: 1
crontab: installing new crontab
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ crontab -e
No modification made
Akshay@Akshay-VirtualBox:~/Desktop/assignment$
```

output:

```
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# and day of week (dow) or use '*' in these fields (for
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
For example, you can run a backup of all your user accounts
#
at 5 a.m every week with:
#05 * * 1 tar -zcf /var/backups/home.tgz /home/
# For more information see the manual pages of crontab(5) and cron(8)
#
#mh
dom mon dow
command
00 09 * * * /Akshay/Desktop/assignment/bc.sh
```

6) dd

code and output:

```
> dd.sh
sh > No Selection
dd if=/dev/sda of=/dev/sdb
dd if=/dev/sda of=/dev/sdb conv=noerror, sync
dd if=/dev/hda1 of=~/partition.img
dd if=/dev/hda of=~/hdadisk.img
dd if=hdadisk.img of=/dev/hdb
dd if=/dev/cdrom of=tgsservice.iso bs=2048
```

7) diff

code:

```
> diff.sh
sh > No Selection
diff f1.txt f2.txt
diff -c f1.txt f2.txt
diff -u f1.txt f2.txt
diff -i f1.txt f2.txt
```

output:

```
< > diff.sh  
f.sh > No Selection  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ chmod +x diff.sh  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash diff.sh  
1,2c1,2  
< Akshay  
< sushanth  
- --  
> sumanthy  
> newton  
*** f1.txt  
--- f2.txt  
2024-03-31 23:01:09.121509250 +0530  
2024-03-31 23:01:30.041877280 +0530  
*****  
*** 1,3 **** ! Akshay ! sushanth tarun  
--- 1,3 ----! sumanthy ! newton tarun  
--- f1.txt  
+++ f2.txt  
2024-03-31 23:01:09.121509250 +0530  
2024-03-31 23:01:30.041877280 +0530  
@@ -1,3 +1,3 @@  
- Akshay  
- sushanth +sumanthy +newton tarun  
1,2c1,2  
< Akshay < sushanth  
- --  
> sumanthy  
> newton  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ |
```

7)finger

code and output:

```
< > finger.sh  
ger.sh > No Selection  
finger Akshay  
echo "Plan details" > ~/.plan  
finger -s Akshay  
finger -p Akshay  
echo "Project details" > ~/.project
```

```
finger.sh > finger.sh
finger.sh > No Selection

Akshay@Akshay-VirtualBox:~$ cd Desktop
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ 
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash finger.sh
finger: /dev//seat0: No such file or directory
Login: Akshay
Name: Akshay
Directory: /Akshay
Shell: /bin/bash
On since Sun Mar 29 13:21 (IST) on seato from login screen
On since Sun Mar 29 13:51 (IST) on tty2 from tty2
1 hours 10 minutes idle
No mail.
Project:
Project details
Plan:
Plan details
finger: /dev//seat0: No such file or directory
Login
Name
Tty
Idle Login Time
Office
Office Phone
Akshay Akshay
seato
Mar 29 13:21 (login screen)
Akshay Akshay
tty2
2:16 Mar 29 13:21 (tty2)
finger: /dev//seat0: No such file or directory
Login: Akshay
Name: Akshay
Directory: /Akshay
Shell: /bin/bash
On since Sun Mar 31 22:21 (IST) on seato from login screen
On since Sun Mar 31 22:21 (IST) on tty2 from tty2
1 hours 10minutes idle
No mail.
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ cd
Akshay@Akshay-VirtualBox:~$ echo "project details" > ~/project
Akshay@Akshay-VirtualBox:~:$ finger Akshay finger: /dev//seat0: No such file or directory
Login: Akshay
Name: Akshay
Directory: /Akshay
Shell: /bin/bash
On since Sun Mar 29 13:21 (IST) on seato from login screen
On since Sun Mar 29 13:51 (IST) on tty2 from tty2
```

```
< > finger.sh  
er.sh } No Selection  
On since Sun Mar 29 13:21 (IST) on seat from login screen  
On since Sun Mar 29 13:51 (IST) on tty2 from tty2  
1 hours 10 minutes idle  
No mail.  
Project:  
Project details  
Plan:  
Plan details  
finger: /dev//seat0: No such file or directory  
Login  
Name  
Tty  
Idle  
Login Time  
Office  
Akshay  
Akshay  
seato  
Mar 29 13:21 (login screen)  
Akshay  
Akshay  
tty2  
2:16  
Ma 29 13:21 (tty2)  
finger: /dev//seat0: No such file or directory  
Login: Akshay  
Name: Akshay  
Directory: /Akshay  
Shell: /bin/bash  
On since Sun Mar 29 13:21 (IST) on seato from login screen  
On since Sun Mar 29 13:51 (IST) on tty2 from tty2  
2 hours 16 minutes idle  
No mail.  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ cd  
Akshay@Akshay-VirtualBox:~$ echo  
"project details" > ~/project  
Akshay@Akshay-VirtualBox:~$ finger Akshay finger: /dev//seat0: No such file or directory  
Login: Akshay  
Name: Akshay  
Directory: /Akshay  
Shell: /bin/bash  
On since Sun Mar 29 13:21 (IST) on seato from login screen  
On since Sun Mar 29 13:51 (IST) on tty2 from tty2  
1 hours 10 minutes idle  
No mail.  
Project:  
project details  
Plan:  
Plan details
```

8) lp

code:

```
< >  [-] lp.sh  
sh > No Selection  
lp file1.txt  
lp -c -n30 file1.txt  
lp -t"KS" -o -f -o -a file1.txt  
lp -s file1.txt  
lp -d myprinter -o cpi=12 -o lpi=8 -o page-left=7
```

9) ipstat:

code:

code:

```
< > [-] lpstat.sh  
stat.sh > No Selection  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ lpstat  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ lpstat  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ cd  
Akshay@Akshay-VirtualBox:~$ lpstat  
  
Akshay@Akshay-VirtualBox:~$ sudo lpstat  
[sudo] password for Akshay:  
  
Akshay@Akshay-VirtualBox:~$ lpstat -p  
  
printer Canon_iR2006_2206_1 is idle.  
enabled since Wed 20 Mar 2024 02:33:49 PM IST  
Akshay@Akshay-VirtualBox:~$ lpstat -o  
  
Akshay@Akshay-VirtualBox:~$ lpstat -a  
  
Canon_iR2006_  
_2206.  
_1 accepting requests since Wed 20 Mar 2024 02:33:49 PM IST  
Akshay@Akshay-VirtualBox:~$ lpstat -t  
  
scheduler is running  
  
no system default destination  
  
device for Canon_  
_iR2006_2206_1: implicitclass://Canon_iR2006_2206.  
Canon_iR2006_2206_  
_1 accepting requests since Wed 20 Mar 2024 02:33:49 PM IST  
printer Canon_iR2006_2206_1 is idle.  
2024 02:33:49 PM IS  
enabled since Wed 20 Mar 2024 02:33:49 PM IST  
  
Akshay@Akshay-VirtualBox:~$ lpstat -0 -l  
Akshay@Akshay-VirtualBox:~$ lpstat -l  
  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$
```

10) mesg

code and output:

```
< > mesg.sh  
sg.sh > No Selection  
  
mesg  
mesg y  
mesg n
```

```
< > mesg.sh  
sg.sh > No Selection  
  
Akshay@Akshay-VirtualBox:~$ cd Desktop/  
Akshay@Akshay-VirtualBox:~/Desktop$ cd assignment  
bash: cd: too many arguments  
Akshay@Akshay-VirtualBox:~/Desktop$ cd assignment  
bash: cd: assignment: No such file or directory  
Akshay@Akshay-VirtualBox:~/Desktop$ cd assignment  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ chmod +x mesg.sh  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash mesg.sh  
is n  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ mesg y  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ mesg  
is y  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$  
  
Akshay@Akshay-VirtualBox:~/Desktop/assignment$
```

11) ln

code and output:

```
< > ln.sh  
h > No Selection  
  
ln f1.txt f8.txt  
ln f4.txt example/  
ln -s f1.txt f7.txt
```

```
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash ln.sh
ln.sh
chgrp.sh comm.sh
dd.txt
example
f2.txt
bctest.txt chown.sh cron.sh diff.sh f1.txt f3.txt
f4.txt
f6.txt
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ ls -v
bc.sh
chgrp.sh comm.sh dd.txt
example f2.txt
f4.txt
bctest.txt
chown.sh cron.sh
diff.sh f1.txt f3.txt
f6.txt
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ ln -v f1.txt
In: failed to create hard link '/f1.txt': File exists
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ ls --help
Usage: ls [OPTION]... [FILE]...
List information about the FILE (the current directory by default).
Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.
Mandatory arguments to long options are mandatory for short options too.
-@, --all
-A, --almost-all
-a, --author
-B, --block-size=SIZE
--escape
--block-size=SIZE
do not ignore entries starting with . do not list implied. and ..
-with -l, print the author of each file print C-style escapes for nongraphic characters with -l, scale sizes by SIZE when printing them; e.g., '--block-size=M'; see SIZE format below
-#, --color[=WHEN]
-C
--ignore-backups
- C
do not list implied entries ending with ~ with -lt: sort by, and show, ctime (time of last modification of file status information); with -l: show ctime and sort by name; otherwise: sort by ctime, newest first
- c
- color[=WHEN]
-d, --directory
-D, --dired
-f
-f, --classify[=WHEN]
list entries by columns
control the output WHEN; more info below list directories themselves, not their contents generate output designed for Emacs' dired mode list all entries in directory order append indicator (one of */>@) to entries WHEN
find.sh finger.sh
findsh finger.sh
In.sh
In.sh
Akshay@Akshay-VirtualBox:~/Desktop/assignment$
```

The screenshot shows a terminal window with the following content:

```
< > [-] In.sh
sh > No Selection
Akshay@Akshay-VirtualBox:~/Desktop/assignment$
```

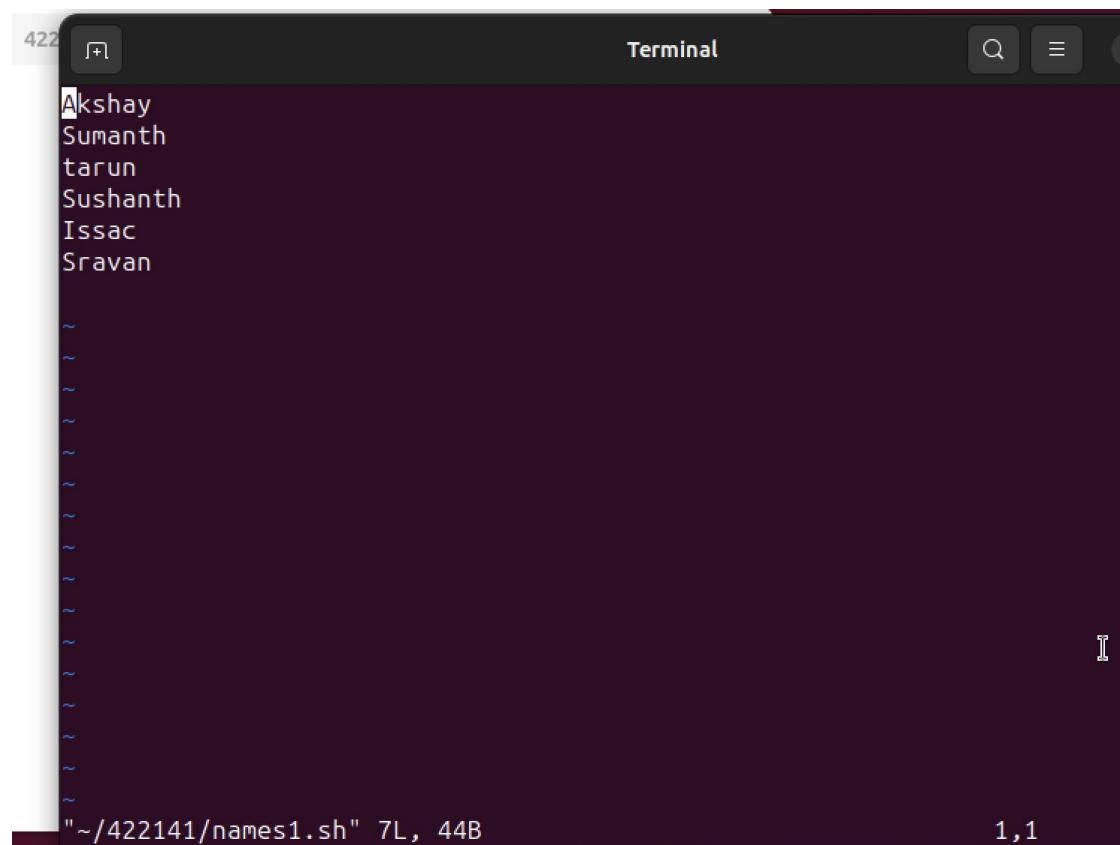
Below the terminal window, the command history is displayed:

```
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ bash ln.sh
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ find -type l•/f7.txt
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ ls -i
413456 bc.sh
400022 bctest.txt
Akshay@Akshay-VirtualBox:~/Desktop/assignment$ 405678 f4.txt
405678 f6.txt
finger.sh|
```

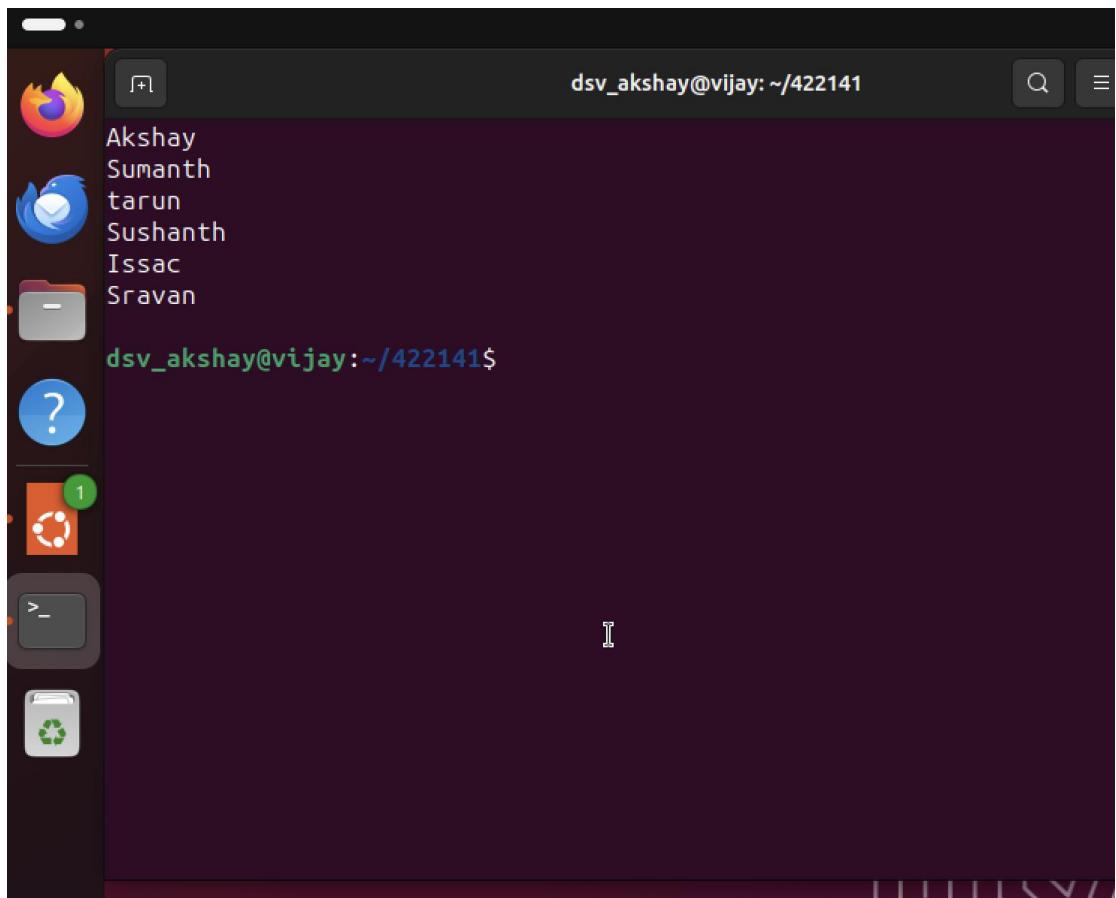
Name:Akshay chinnu
Sec:A
Roll Number:422141

Unix Assignment:7

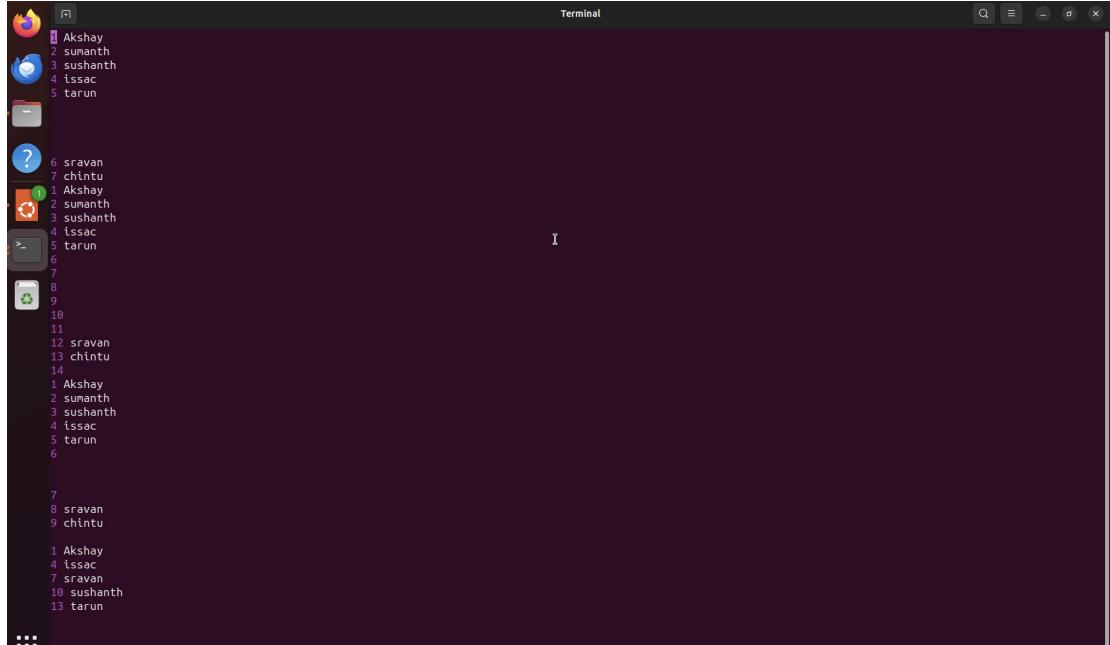
1) More Command



A screenshot of a terminal window titled "Terminal". The window has a dark background and light-colored text. At the top, there are several icons: a search icon, a refresh icon, and a menu icon. The main area of the terminal displays a list of names, each preceded by a tilde (~). The names listed are: Akshay, Sumanth, tarun, Sushanth, Issac, Sravan. Below this list, there are approximately 15 blank lines, each starting with a tilde (~). In the bottom right corner of the terminal window, there is a small icon of two vertical bars. At the very bottom of the terminal window, the path "~/422141/names1.sh" is displayed, along with the text "7L, 44B" and the coordinates "1,1".



2) Nl command



Nice command

```
dsv_akshay@vijay:~/422141$ ps -el | grep terminal
0 S 1000 2358 1481 0 80 0 - 177226 do_pol ? 00:00:02 gnome-terminal
dsv_akshay@vijay:~/422141$ nice --10 qmoe-terminal
nice: cannot set niceness: Permission denied
nice: 'qmoe-terminal': No such file or directory
dsv_akshay@vijay:~/422141$ renice -n 15 -p 2524
renice: failed to get priority for 2524 (process ID): No such process
dsv_akshay@vijay:~/422141$ ps -el | grep terminal
0 S 1000 2358 1481 0 80 0 - 177226 do_pol ? 00:00:03 gnome-terminal
dsv_akshay@vijay:~/422141$ renice -n 10 -p 4
renice: failed to get priority for 4 (process group ID): No such process
dsv_akshay@vijay:~/422141$ renice -n 10 -q 1
renice: failed to set priority for 1 (process group ID): Operation not permitted
dsv_akshay@vijay:~/422141$ sudo renice -n 1 -u 0
0 (process group ID) old priority 0, new priority 10
dsv_akshay@vijay:~/422141$ sudo renice -n 10 -u 0
[sudo] password for dsv_akshay:
renice: invalid priority '1'.
Try 'renice --help' for more information.
dsv_akshay@vijay:~/422141$ sudo renice -n 10 -u 0
0 (user ID) old priority -20, new priority 10
dsv_akshay@vijay:~/422141$
```

passwd command

```
dsv_akshay@vijay:~/422141$ passwd
Changing password for dsv_akshay.
Current password:
New password:
BAD PASSWORD: The password is the same as the old one
New password:
BAD PASSWORD: The password is shorter than 8 characters
New password:
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic
passwd: Have exhausted maximum number of retries for service
passwd: password unchanged
dsv_akshay@vijay:~/422141$ passwd Akshay
passwd: user 'Akshay' does not exist
dsv_akshay@vijay:~/422141$ passwd dsv_akshay
Changing password for dsv_akshay.
Current password:
New password:
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic
New password:
BAD PASSWORD: The password is shorter than 8 characters
New password:
BAD PASSWORD: The password is shorter than 8 characters
passwd: Have exhausted maximum number of retries for service
passwd: password unchanged
dsv_akshay@vijay:~/422141$ passwd dsv_akshay
Changing password for dsv_akshay.
Current password:
New password:
Retype new password:
Sorry, passwords do not match.
New password:
Retype new password:
passwd: password updated successfully
dsv_akshay@vijay:~/422141$ sudo passwd root
New password:
Retype new password:
passwd: password updated successfully
dsv_akshay@vijay:~/422141$
```



```
dsv_akshay@vijay:~/422141$ sudo passwd root
New password:
Retype new password:
passwd: password updated successfully
dsv_akshay@vijay:~/422141$ passwd dsv_akshay
Changing password for dsv_akshay.
Current password:
New password:
BAD PASSWORD: The password is shorter than 8 characters
New password:
BAD PASSWORD: The password is shorter than 8 characters
New password:
BAD PASSWORD: The password is shorter than 8 characters
passwd: Have exhausted maximum number of retries for service
```

rlogin command

```
1 dsv_akshay@vijay: ~/42214 $ sudo apt-get install rsh-client
2 sudo: apt-get: command not found
3 dsv_akshay@vijay: ~/42214 $ sudo apt-get install rsh-client
4 Reading package lists... Done
5 Building dependency tree... Done
6 Reading state information... Done
7 The following NEW packages will be installed:
8   rsh-client
9 0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
10 Need to get 27.7 kB of archives.
11 After this operation, 234 kB of additional disk space will be used.
12 get: http://ports.ubuntu.com/ubuntu-ports/mantic/universe arm64 rsh-client arm64 0.17-24 [27.7 kB]
13 fetched 27.7 kB in 0s (24.2 kB/s)
14 Selecting previously unselected package rsh-client.
15 (Reading database ... 161247 files and directories currently installed.)
16 Preparing to unpack .../rsh-client_0.17-24_arm64.deb ...
17 Unpacking rsh-client (0.17-24) ...
18 Setting up rsh-client (0.17-24) ...
19 update-alternatives: using /usr/bin/netkit-rcp to provide /usr/bin/rcp (rcp) in auto mode
20 update-alternatives: using /usr/bin/netkit-rsh to provide /usr/bin/rsh (rsh) in auto mode
21 update-alternatives: using /usr/bin/netkit-rlogin to provide /usr/bin/rlogin (rlogin) in auto mode
22 Processing triggers for man-db (2.11.2-3) ...
23 scanning processes...
24 Scanning linux images...
25
26 Running kernel seems to be up-to-date.
27
28 No services need to be restarted.
29
30 No containers need to be restarted.
31
32 No user sessions are running outdated binaries.
33
34 No VM guests are running outdated hypervisor (qemu) binaries on this host.
35 dsv_akshay@vijay: ~/42214 $ ip addr
36
37 1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
38     link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
39     inet 127.0.0.1/8 brd 0.0.0.0 scope host lo
40         valid_lft forever preferred_lft forever
41     inet6 ::1/128 scope host
42         valid_lft forever preferred_lft forever
43
44 2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
45     link/ether 22:03:51:c8:84:06 brd ff:ff:ff:ff:ff:ff
46     inet 192.168.64.3/24 brd 192.168.64.255 scope global dynamic noprefixroute enp0s1
47         valid_lft 84119sec preferred_lft 84119sec
48     inet6 fd99:99c9:6ca:7c6f:1f62:7c8a:3f13:4c23/64 scope global temporary dynamic
49         valid_lft 60252sec preferred_lft 84096sec
50     inet6 fd99:99c9:6ca:7c6f:2003:51ff:fe8:8406/64 scope global dynamic mngtmpaddr
51         valid_lft 259190sec preferred_lft 604705sec
52     inet6 fe80::2003:51ff:fe8:8406/64 scope link
53         valid_lft forever preferred_lft forever
54
55 dsv_akshay@vijay: ~/42214 $ sudo customstl status cleain
```

talk
command

```
dsv_akshey@vijay:~/422141$ sudo apt install inetutils talk
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package inetutils
dsv_akshey@vijay:~/422141$ sudo apt install talk
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  talkd
The following NEW packages will be installed:
  talk
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 17.1 kB of archives.
After this operation, 91.1 kB of additional disk space will be used.
Get:1 http://ports.ubuntu.com/ubuntu-ports mantic/universe arm64 talk arm64 0.17-18 [17.1 kB]
Fetched 17.1 kB in 0s (33.6 kB/s)
Selecting previously unselected package talk.
(Reading database ... 161258 files and directories currently installed.)
Preparing to unpack .../talk_0.17-18_arm64.deb ...
Unpacking talk (0.17-18) ...
Setting up talk (0.17-18) ...
update-alternatives: using /usr/bin/netkit-ntalk to provide /usr/bin/talk (talk) in auto mode
Processing triggers for man-db (2.11.2-3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
dsv_akshey@vijay:~/422141$ talk root
dsv_akshey@vijay:~/422141$
```

```
[Checking for invitation on caller's machine]
```

rlogin

```
dsv_akshay@vijay: $ ip add
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 22:03:51:c8:b4:06 brd ff:ff:ff:ff:ff:ff
        inet 192.168.64.3/24 brd 192.168.64.255 scope global dynamic noprefixroute enp0s1
            valid_lft 85341sec preferred_lft 85341sec
        inet6 fd99:99c9:6ca:7c6f:9424:7116:5387:8fbe/64 scope global temporary dynamic
            valid_lft 603743sec preferred_lft 85075sec
        inet6 fd99:99c9:6ca:7c6f:2003:51ff:fe08:b406/64 scope global dynamic mngtmpaddr
            valid_lft 2591987sec preferred_lft 604787sec
        inet6 fe80::2003:51ff:fe08:b406/64 scope link
            valid_lft forever preferred_lft forever
dsv_akshay@vijay: $ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
I
2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 22:03:51:c8:b4:06 brd ff:ff:ff:ff:ff:ff
        inet 192.168.64.3/24 brd 192.168.64.255 scope global dynamic noprefixroute enp0s1
            valid_lft 85337sec preferred_lft 85337sec
        inet6 fd99:99c9:6ca:7c6f:9424:7116:5387:8fbe/64 scope global temporary dynamic
            valid_lft 603739sec preferred_lft 85071sec
        inet6 fd99:99c9:6ca:7c6f:2003:51ff:fe08:b406/64 scope global dynamic mngtmpaddr
            valid_lft 2591983sec preferred_lft 604783sec
        inet6 fe80::2003:51ff:fe08:b406/64 scope link
            valid_lft forever preferred_lft forever
dsv_akshay@vijay: $ sudo apt spt-get install rsh-client
[sudo] password for dsv_akshay:
E: Invalid operation spt-get
dsv_akshay@vijay: $ sudo apt-get install rsh-client
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
rsh-client is already the newest version (0.17-24).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
dsv_akshay@vijay: $ rlogin dsv_akshay@172.50.5.182
dsv_akshay@172.50.5.182: Unknown host
dsv_akshay@vijay: $ ls
```

```
inet 127.0.0.1/8 scope host lo
    valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 22:03:51:c8:b4:06 brd ff:ff:ff:ff:ff:ff
    inet 192.168.64.3/24 brd 192.168.64.255 scope global dynamic noprefixroute enp0s1
        valid_lft 85341sec preferred_lft 85341sec
    inet6 fd99:99c9:6ca:7c6f:9424:7116:5387:8fbe/64 scope global temporary dynamic
        valid_lft 167:5387:8fbe/64 scope global dynamic mngtmpaddr
    inet6 fe80::2003:51ff:fe00:b406/64 scope link
        valid_lft forever preferred_lft forever
dsv_akshay@vijay: $ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 22:03:51:c8:b4:06 brd ff:ff:ff:ff:ff:ff
    inet 192.168.64.3/24 brd 192.168.64.255 scope global dynamic noprefixroute enp0s1
        valid_lft 85337sec preferred_lft 85337sec
    inet6 fd99:99c9:6ca:7c6f:9424:7116:5387:8fbe/64 scope global temporary dynamic
        valid_lft 167:5387:8fbe/64 scope global dynamic mngtmpaddr
    inet6 fe80::2003:51ff:fe00:b406/64 scope link
        valid_lft forever preferred_lft forever
dsv_akshay@vijay: $ sudo apt spt-get install rsh-client
[sudo] password for dsv_akshay:
E: Invalid operation spt-get
dsv_akshay@vijay: $ sudo apt-get install rsh-client
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
rsh-client is already the newest version (0.17-24).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
dsv_akshay@vijay: $ rlogin dsv_akshay@172.50.5.182
dsv_akshay@172.50.5.182: Unknown host
dsv_akshay@vijay: $ ls
422141  Documents  [mount]  Pictures  Public  Templates
Desktop  Downloads  Music      point]  snap    Videos
dsv_akshay@vijay: $
```

```
dsv_akshay@vijay:~/42214$ tput cols  
159  
dsv_akshay@vijay:~/42214$ tput sms0  
dsv_akshay@vijay:~/42214$
```

tty
command:

```
dsv_akshay@vijay:~/42214$ tty  
/dev/pts/0  
dsv_akshay@vijay:~/42214$
```

uname command

```
dsv_akshay@vijay:~/42214$ uname
Linux
dsv_akshay@vijay:~/42214$ uname -a
Linux vijay 6.5.0-27-generic #28-Ubuntu SMP PREEMPT_DYNAMIC Fri Mar  8 00:42:16 UTC 2024 aarch64 aarch64 aarch64 GNU/Linux
Linux
dsv_akshay@vijay:~/42214$ uname -n
vijay
dsv_akshay@vijay:~/42214$ uname -r
6.5.0-27-generic
dsv_akshay@vijay:~/42214$ uname -v
#28-Ubuntu SMP PREEMPT_DYNAMIC Fri Mar  8 00:42:16 UTC 2024
dsv_akshay@vijay:~/42214$ uname -m
aarch64
dsv_akshay@vijay:~/42214$ uname -o
GNU/Linux
dsv_akshay@vijay:~/42214$ 
dsv_akshay@vijay:~/42214$
```

who command

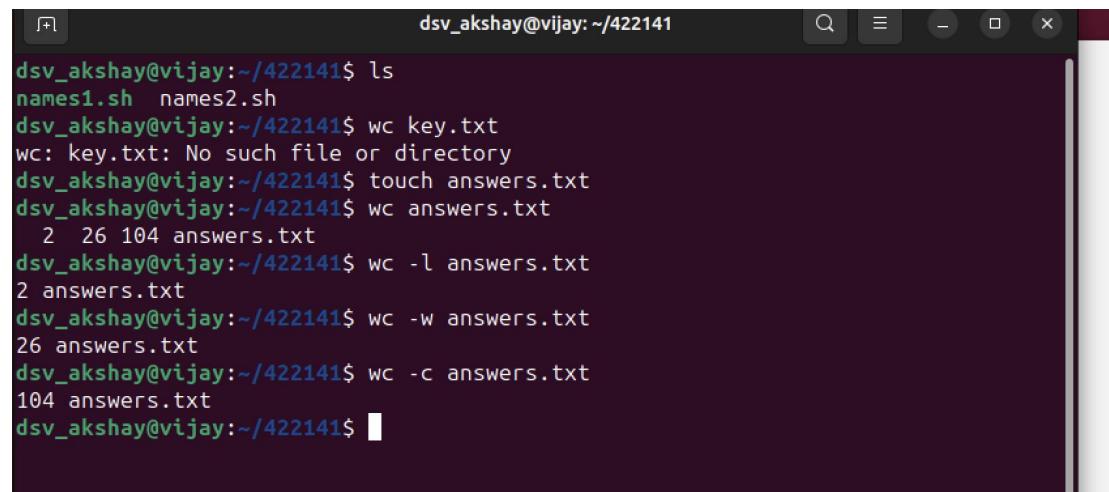
-
-

```
dsv_akshay@vijay:~/42214$ who
dsv_akshay seat0      2024-04-11 15:56 (login screen)
dsv_akshay tty2       2024-04-11 15:56 (tty2)
dsv_akshay@vijay:~/42214$ who -H
          NAME   LINE        TIME     COMMENT
dsv_akshay seat0      2024-04-11 15:56 (login screen)
dsv_akshay tty2       2024-04-11 15:56 (tty2)
dsv_akshay@vijay:~/42214$ who -a
          system boot    2024-04-11 15:56
          run-level 5    2024-04-11 15:56
LOGIN      ttyAMA0     2024-04-11 15:56          954 id=AMA0
dsv_akshay ? seat0      2024-04-11 15:56      ?          1538 (login screen)
dsv_akshay + tty2       2024-04-11 15:56  old          1538 (tty2)
          pts/1        2024-04-11 16:42          3774 id=ts/1 term=0 exit=0
dsv_akshay@vijay:~/42214$
```

write command:

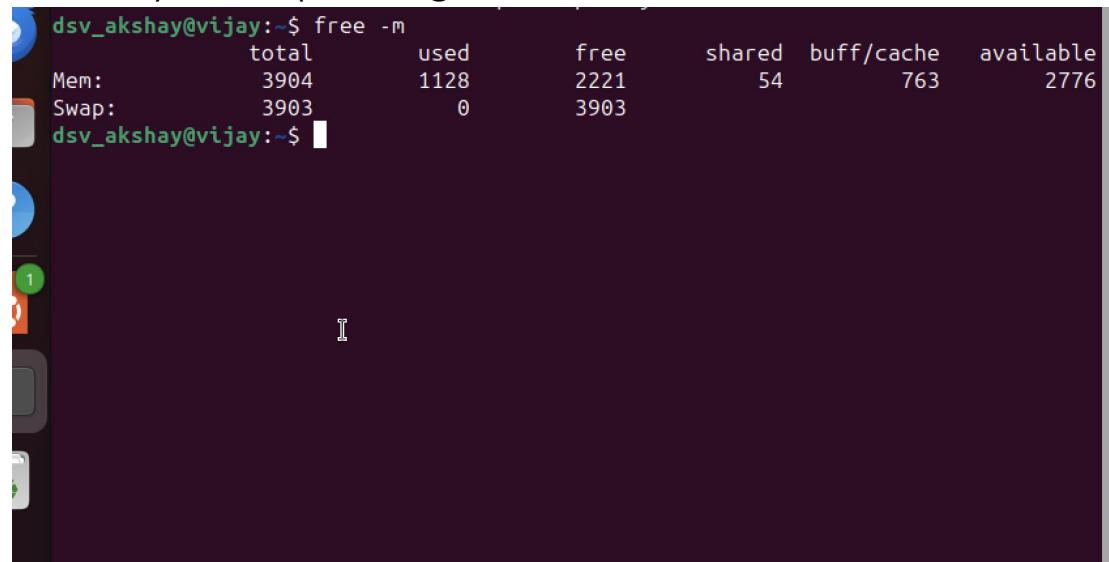
```
dsv_akshay@vijay:~/422141$ who
dsv_akshay seato 2024-04-11 15:56 (login screen)
dsv_akshay tty 22024-04-11 15:56 (tty2)
dsv_akshay@vijay:~/422141$ write dsv_akshay
Hi this is dsv_akshay2 user
```

wc command



```
dsv_akshay@vijay:~/422141$ ls
names1.sh names2.sh
dsv_akshay@vijay:~/422141$ wc key.txt
wc: key.txt: No such file or directory
dsv_akshay@vijay:~/422141$ touch answers.txt
dsv_akshay@vijay:~/422141$ wc answers.txt
    2   26 104 answers.txt
dsv_akshay@vijay:~/422141$ wc -l answers.txt
2 answers.txt
dsv_akshay@vijay:~/422141$ wc -w answers.txt
26 answers.txt
dsv_akshay@vijay:~/422141$ wc -c answers.txt
104 answers.txt
dsv_akshay@vijay:~/422141$
```

Memory and cpu usage



```
dsv_akshay@vijay:~$ free -m
              total        used        free      shared  buff/cache   available
Mem:       3904       1128       2221         54       763      2776
Swap:      3903          0       3903
dsv_akshay@vijay:~$
```

Name:Akshay chinnu

Sec:A

Roll number: 422141

Assignment:8

The screenshot shows a GitHub repository page for '422141_UNIX'. The repository is public and has 1 branch and 0 tags. The main branch contains 19 commits. The commits are listed below:

Commit	Message	Date
9b2c377	Add files via upload	5 days ago
assign_1	Add files via upload	5 days ago
assign_2	Add files via upload	5 days ago
assign_3	Add files via upload	5 days ago
assign_6	Add files via upload	5 days ago
assign_7	Add files via upload	5 days ago
assignment_4	Add files via upload	5 days ago
assignment_5	Add files via upload	5 days ago
README.md	Initial commit	2 weeks ago
assign_5	Update	last week

https://github.com/Akshaya87/422141_UNIX