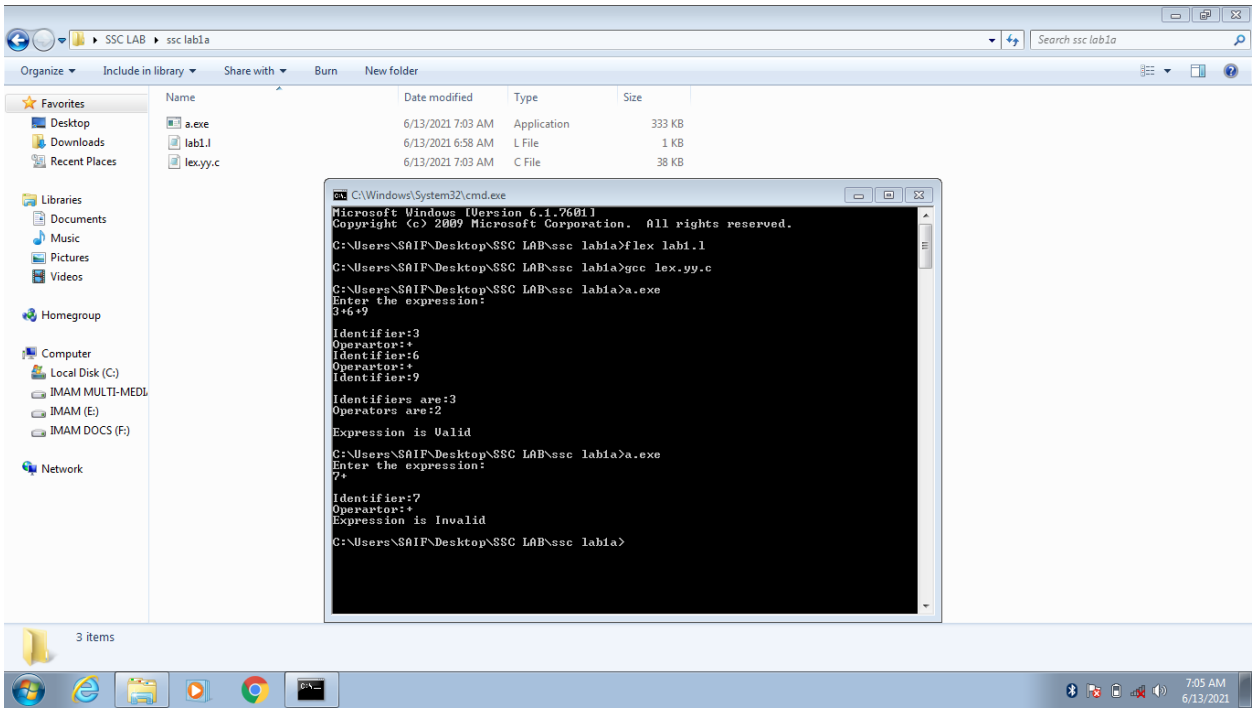
1a. Write a LEX program to recognize valid *arithmetic expression.* Identifiers in the expression could be only integers and operators could be + and *. Count the identifiers & operators present and print them separately.

Lex program

```
%{

#include<stdio.h>

int v=0,op=0,id=0,flag=0;

%}

%%

[0-9][0-9]* {id++;printf("\nIdentifier:");ECHO;}

[\+\-\*\/\=] {op++;printf("\nOperartor:");ECHO;}

"(" {v++;}

")" {v--;}

";" {flag=1;}

.|\n {return 0;}

%%

int main()

{

        printf("Enter the expression:\n");

        yylex();

        if((op+1) ==id && v==0 && flag==0)

        {
```

```
            printf("\n\nIdentifiers are:%d\nOperators are:%d\n",id,op);
            printf("\nExpression is Valid\n");
        }
        else
            printf("\nExpression is Invalid\n");
        return 1;
}
int yywrap()
{
        return 1;
}
```

Output:



Steps to compile and Run the Lex program

To Compile Lex Program: flex file_name.l

After the successful compilation of the lex program the lex.yy.c file is generated automatically

To Run Lex Program : gcc lex.yy.c

After the successful Run of the lex program the a.exe file is generated automatically

To see the output of Lex program type a.exe in the command prompt

To Execute:a.exe

Note: you have to go location where u have safed the file(i.e Lex Program) and open the command prompt there only. And then compile, run and execute the program. All steps are shown in the above output picture.

1 b. Write YACC program to evaluate *arithmetic expression* involving operators: +, -,*, and /

Lex program

```
%option noyywrap
%{
#include "y.tab.h"
extern yylval;
%}
%%
[0-9]+              {yylval=atoi(yytext);return num;}
[\+\-\*\/]      {return yytext[0];}
[)]             {return yytext[0];}
[(]             {return yytext[0];}
.                   {;}
\n                  {return 0;}
%%
```

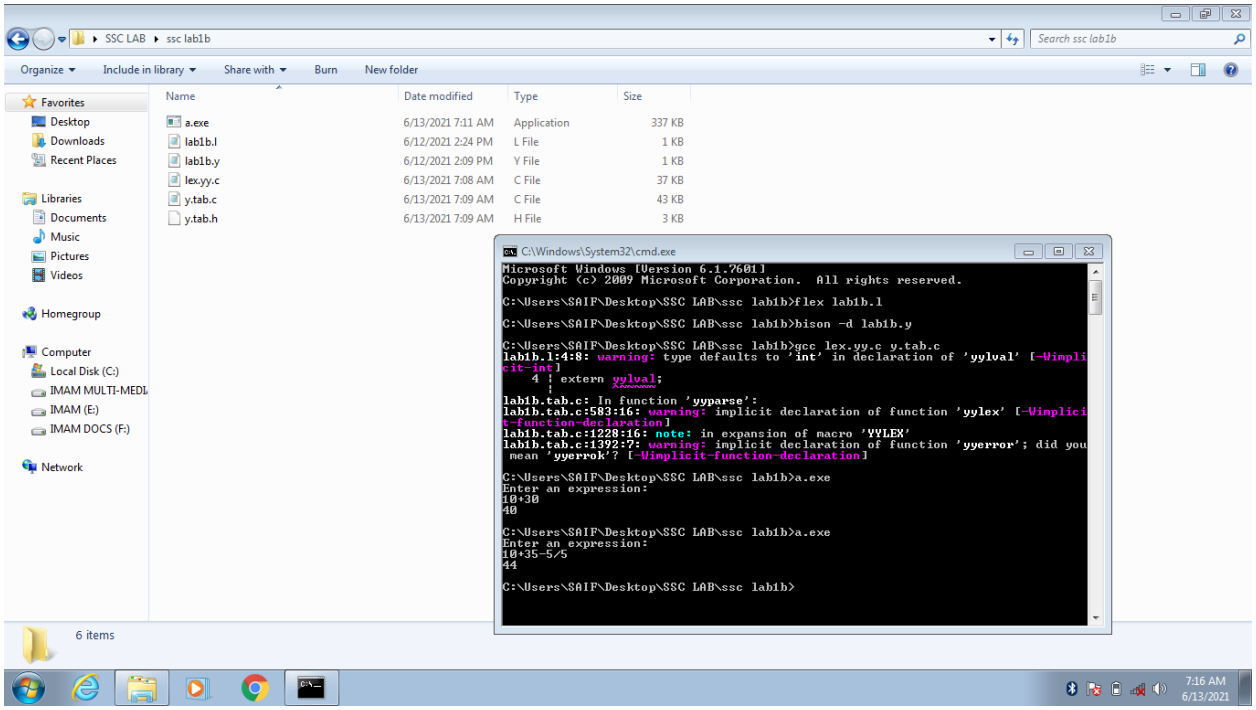
Yacc program

```
%{
#include<stdio.h>
#include<stdlib.h>
%}
```

```
%token num
%left '+' '-'
%left '*' '/'
%%
input:exp {printf("%d\n",$$);exit(0);}
exp:    exp'+'exp {$$=$1+$3;}
                |exp'-'exp{$$=$1-$3;}
                |exp'*'exp{$$=$1*$3;}
                |exp'/'exp { if($3==0){printf("Divide by Zero. Invalid
expression.\n");exit(0);}
                else $$=$1/$3;}
                |'('exp')'{$$=$2;}
                |num{$$=$1;};
%%
int yyerror()
{
        printf("Error. Invalid Expression.\n");
        exit(0);
}
int main()
{
        printf("Enter an expression:\n");
```

```
    yyparse();
}
```

Output:



Steps to compile and Run the Lex and Yacc program

To Compile Lex Program : flex file_name.l

After the successful compilation of the lex program the lex.yy.c file is generated automatically

To Compile Yacc program : bison –d filename.y

After the successful compilation of the yacc program the 2 files is generated automatically namely

1 file_name.tab.c and

2 file name.tab.h

Rename that 2 files to y.tab.c and y.tab.h

To Run Lex and Yacc Program : gcc lex.yy.c y.tab.c

After the successful Run of the lex and Yacc program the a.exe file is generated automatically

To see the output of Lex and Yacc program type a.exe in the command prompt

To Execute:a.exe

Note: you have to go location where u have safed the files(i.e Lex and Yacc Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

2. Develop, Implement and Execute a program using YACC tool to recognize all strings ending with *b* preceded by *na's* using the grammar *an b* (note: input *n* value).

Lex program

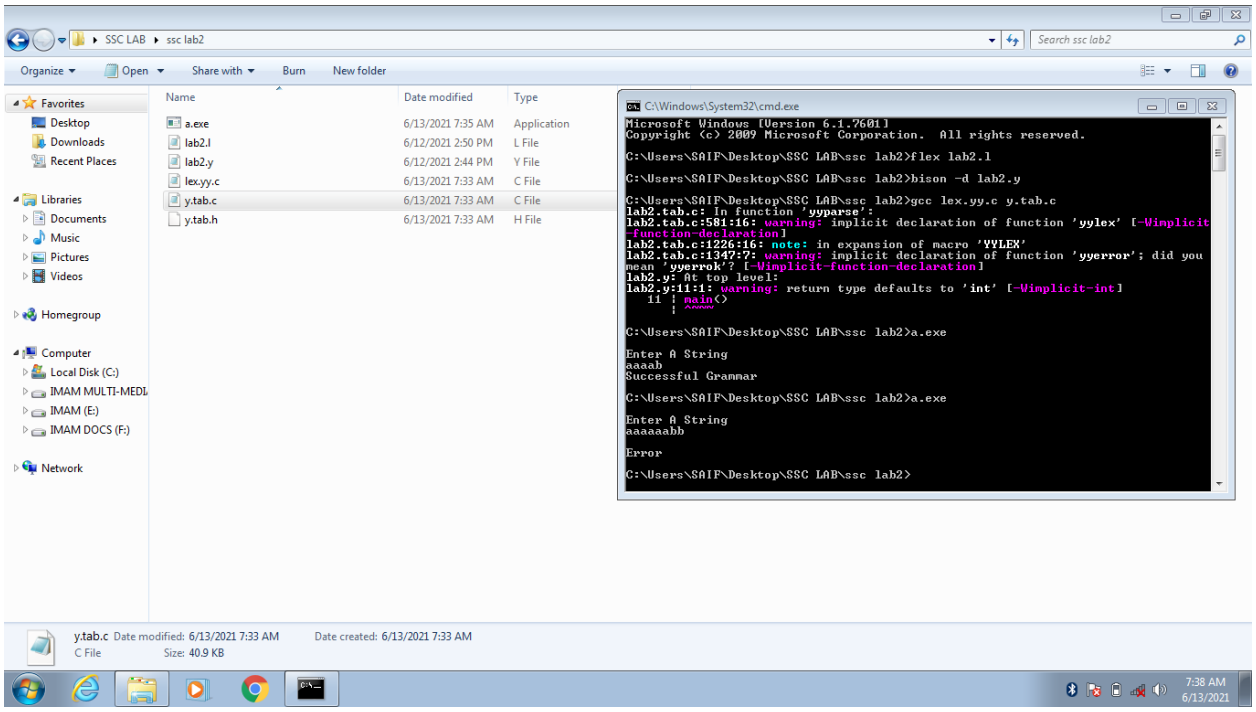
```
%option noyywrap

%{

#include "y.tab.h"

%}

%%

a               {return A;}

b               {return B;}

[\n]    return '\n';

%%
```

Yacc program

```
%{

#include<stdio.h>

#include<stdlib.h>

%}

%token A B

%%

input: s'\n' {printf("Successful Grammar\n");exit(0);}
```

```
        s: A s1 B| B
        s1: ; | A s1
%%
main()
{
    printf("\nEnter A String\n");
    yyparse();
}
int yyerror()
{
    printf("\nError \n");
    exit(0);
}
```

Output:



Steps to compile and Run the Lex and Yacc program

To Compile Lex Program : flex file_name.l

After the successful compilation of the lex program the lex.yy.c file is generated automatically

To Compile Yacc program : bison –d filename.y

After the successful compilation of the yacc program the 2 files is generated automatically namely

1 file_name.tab.c and

2 file name.tab.h

Rename that 2 files to y.tab.c and y.tab.h

To Run Lex and Yacc Program : gcc lex.yy.c y.tab.c

After the successful Run of the lex and Yacc program the a.exe file is generated automatically

To see the output of Lex and Yacc program type a.exe in the command prompt

To Execute:a.exe

Note: you have to go location where u have safed the files(i.e Lex and Yacc Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

3. Design, develop and implement YACC/C program to construct *Predictive / LL(1) Parsing Table* for the grammar rules: *A → aBa , B → bB | ε*. Use this table to parse the sentence: *abba$*

C program

```
#include<stdlib.h>

#include<string.h>

#include<stdio.h>

char prod[3][10]={"A->aBa","B->bB","B->@"}, input[10],stack[25];

int top=-1; int j=0,k,l;

void push(char item)

{

        stack[++top]=item;

}

void pop()

{

        top=top-1;

}

void display()

{

        int j;

        for(j=top;j>=0;j--)

                printf("%c",stack[j]);
```

```
}
void stackpush(char p)
{
        if(p=='A')
        {
                pop();
                for(j=strlen(prod[0])-1;j>=3;j--)
                        push(prod[0][j]);
        }
        else
        {
                pop();
                for(j=strlen(prod[1])-1;j>=3;j--)
                        push(prod[1][j]);
        }
}
void main()
{
        char c; int i;
        printf("first(A)={a}\t");
        printf("follow(A)={$}\n");
        printf("first(B)={b,@}\t");
```

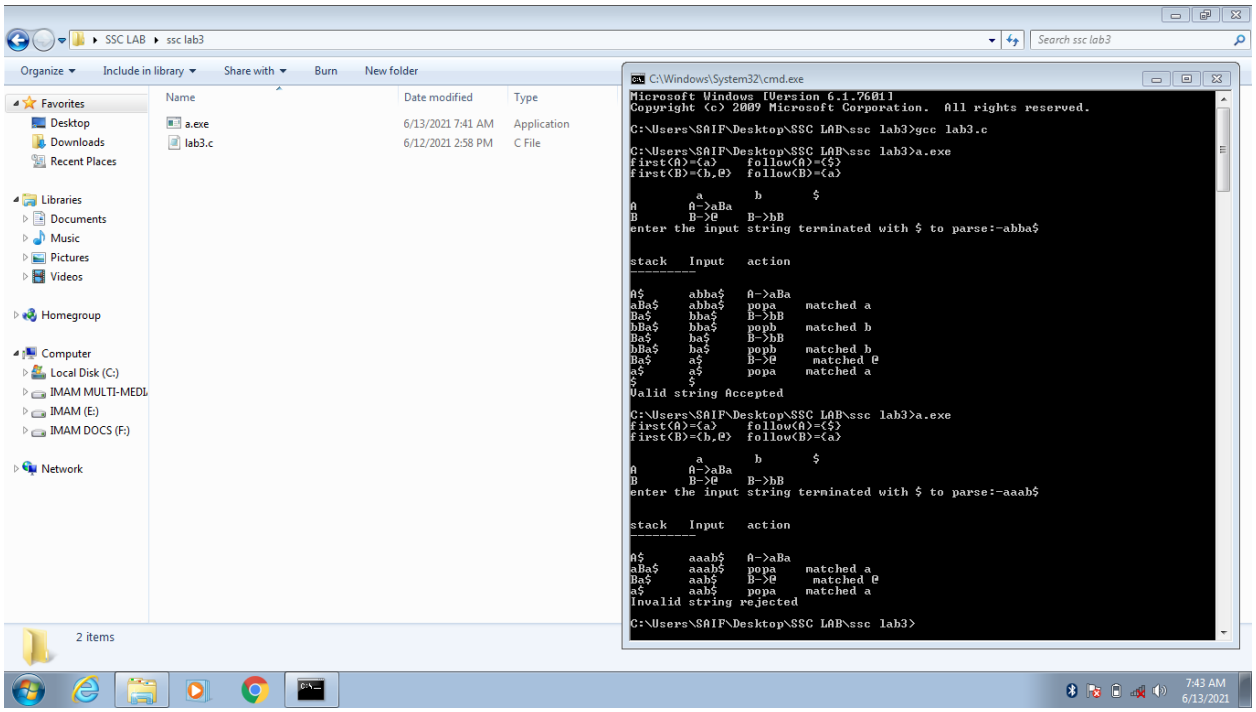
```
printf("follow(B)={a}\n\n");
printf("\t a \t b \t $ \n");
printf("A\t%s\n",prod[0]);
printf("B\t%s\t%s\n",prod[2],prod[1]);
printf("enter the input string terminated with $ to parse:-");
scanf("%s",input);
for(i=0;input[i]!='\0';i++)
{
        if((input[i]!='a')&&(input[i]!='b')&&(input[i]!='$'))
        {
                printf("invalid string");
                exit(0);
        }
}
if(input[i-1]!='$')
{
        printf("\n\nInput string entered without end marker $");
        exit(0);
}
push('$');
push('A');
i=0;
```

```
printf("\n\n");
printf("stack\tInput\taction");
printf("\n---------\n");
while(i!=strlen(input)&&stack[top]!='$')
{
	printf("\n");
	for(l=top;l>=0;l--)
		printf("%c",stack[l]);
	printf("\t");
	for(l=i;l<strlen(input);l++)
		printf("%c",input[l]);
	printf("\t");
	if(stack[top]=='A')
	{
		printf("A->aBa");
		stackpush('A');
	}
	else if(stack[top]=='B')
	{
		if(input[i]!='b')
		{
			printf("B->@");
```

```
                printf("\t matched @");
                pop();
            }
            else
            {
                printf("B->bB");
                stackpush('B');
            }
        }
        else
        {
            if(stack[top]==input[i])
            {
                printf("pop%c",input[i]);
                printf("\tmatched %c",input[i]);
                pop();
                i++;
            }
            else
                break;
        }
}
```

```
        if(stack[top]=='$' && input[i]=='$')
        {
                printf("\n$\t$");
                printf("\nValid string Accepted\n");
        }
        else
                printf("\nInvalid string rejected\n");
}
```

Output:



Steps to compile and Run the c program

To Compile c Program : gcc file_name.c

After the successful compilation of the c program the a.exe file is generated automatically

To Run c Program : a.exe

Note: you have to go location where u have safed the file(i.e c Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

4. Design, develop and implement YACC/C program to demonstrate *Shift Reduce Parsing* techniquefor the grammar rules: *E →E+T | T, T →T*F | F, F →(E) | id* and parse the sentence: *id + id * id*.

C program

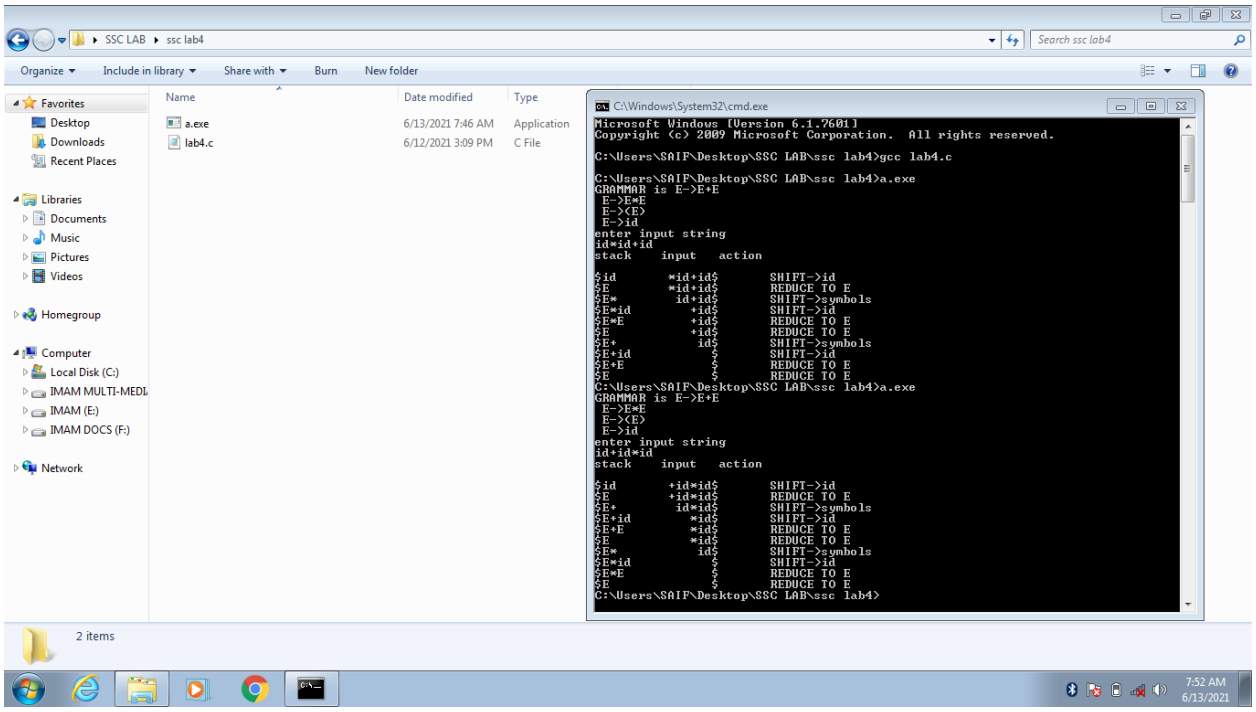
```
#include<stdio.h>

#include<string.h>

int k=0,z=0,i=0,j=0,c=0;

char a[16],ac[20],stk[15],act[10];

void check();

void main()

{

        puts("GRAMMAR is E->E+E \n E->E*E \n E->(E) \n E->id");

        puts("enter input string ");

        gets(a);

        c=strlen(a);

        strcpy(act,"SHIFT->");

        puts("stack \t input \t action");

        for(k=0,i=0; j<c; k++,i++,j++)

        {

                if(a[j]=='i' && a[j+1]=='d')

                {

                        stk[i]=a[j];
```

```
                stk[i+1]=a[j+1];
                stk[i+2]='\0';
                a[j]=' ';
                a[j+1]=' ';
                printf("\n$%s\t%s$\t%sid",stk,a,act);
                check();
            }
            else
            {
                stk[i]=a[j];
                stk[i+1]='\0';
                a[j]=' ';
                printf("\n$%s\t%s$\t%ssymbols",stk,a,act);
                check();
            }
        }
}
void check()
{
        strcpy(ac,"REDUCE TO E");
        for(z=0; z<c; z++)
            if(stk[z]=='i' && stk[z+1]=='d')
```

```
        {
                stk[z]='E';
                stk[z+1]='\0';
                printf("\n$%s\t%s$\t%s",stk,a,ac);
                j++;
        }
for(z=0; z<c; z++)
        if(stk[z]=='E' && stk[z+1]=='+' && stk[z+2]=='E')
        {
                stk[z]='E';
                stk[z+1]='\0';
                stk[z+2]='\0';
                printf("\n$%s\t%s$\t%s",stk,a,ac);
                i=i-2;
        }
for(z=0; z<c; z++)
        if(stk[z]=='E' && stk[z+1]=='*' && stk[z+2]=='E')
        {
                stk[z]='E';
                stk[z+1]='\0';
                stk[z+1]='\0';
                printf("\n$%s\t%s$\t%s",stk,a,ac);
```

```
                i=i-2;
        }
    for(z=0; z<c; z++)
        if(stk[z]=='(' && stk[z+1]=='E' && stk[z+2]==')')
        {
            stk[z]='E';
            stk[z+1]='\0';
            stk[z+1]='\0';
            printf("\n$%s\t%s$\t%s",stk,a,ac);
            i=i-2;
        }
}
```

Output:



Steps to compile and Run the c program

To Compile c Program : gcc file_name.c

After the successful compilation of the c program the a.exe file is generated automatically

To Run c Program : a.exe

Note: you have to go location where u have safed the file(i.e c Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

5. Design, develop and implement a C/Java program to generate the machine code using *Triples* for the statement *A = -B * (C +D)* whose intermediate code in three-address form:

T1 = -B
T2 = C + D
T3 = T1 + T2
A = T3

C program

```
#include<stdio.h>

#include<stdlib.h>

#include<ctype.h>

char op[2],arg1[5],arg2[5],result[5];

void main()

{

        FILE *fp1,*fp2;

        fp1=fopen("input.txt","r");

        fp2=fopen("output.txt","w");

        while(!feof(fp1))

        {

                fscanf(fp1,"%s%s%s%s",result,arg1,op,arg2);

                if(strcmp(op,"+")==0)

                {

                        fprintf(fp2,"\nMOV R0,%s",arg1);

                        fprintf(fp2,"\nADD R0,%s",arg2);
```

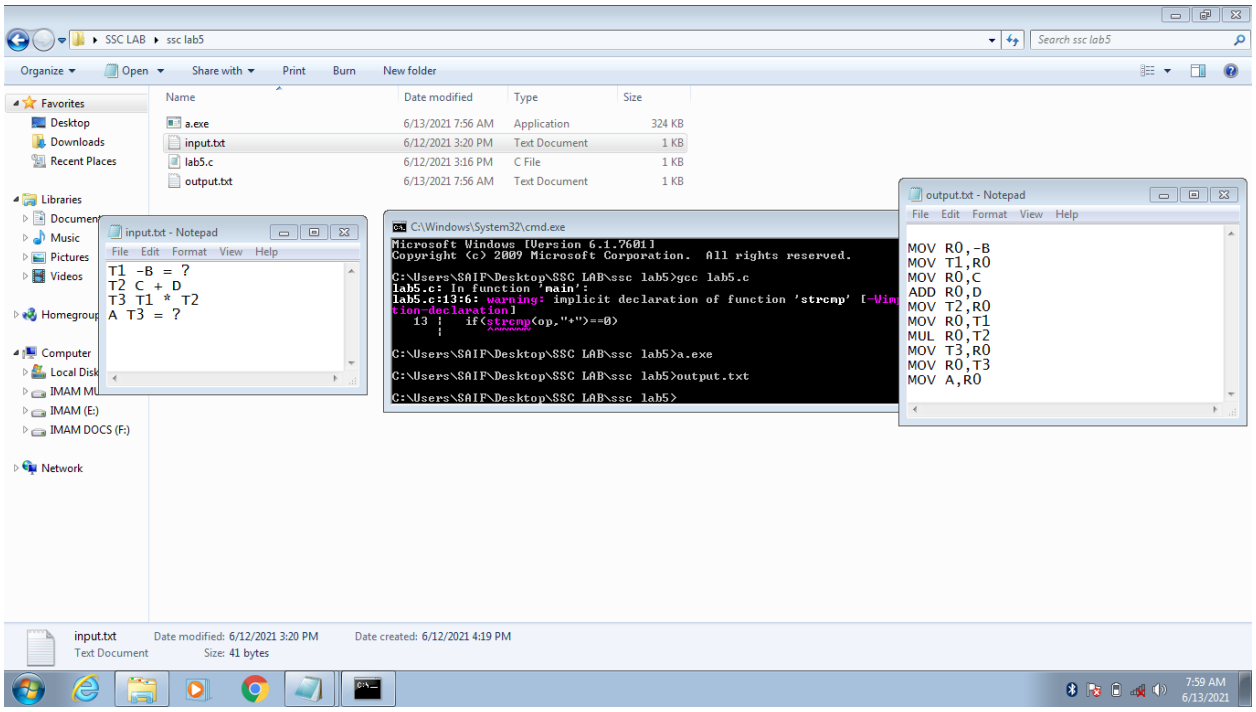
```
        fprintf(fp2,"\nMOV %s,R0",result);
}
if(strcmp(op,"*")==0)
{
        fprintf(fp2,"\nMOV R0,%s",arg1);
        fprintf(fp2,"\nMUL R0,%s",arg2);
        fprintf(fp2,"\nMOV %s,R0",result);
}
if(strcmp(op,"-")==0)
{
        fprintf(fp2,"\nMOV R0,%s",arg1);
        fprintf(fp2,"\nSUB R0,%s",arg2);
        fprintf(fp2,"\nMOV %s,R0",result);
}
if(strcmp(op,"/")==0)
{
        fprintf(fp2,"\nMOV R0,%s",arg1);
        fprintf(fp2,"\nDIV R0,%s",arg2);
        fprintf(fp2,"\nMOV %s,R0",result);
}
if(strcmp(op,"=")==0)
{
```

```
                    fprintf(fp2,"\nMOV R0,%s",arg1);
                    fprintf(fp2,"\nMOV %s,R0",result);
                }
        }
        fclose(fp1);
        fclose(fp2);
}
```

Input.txt file

```
T1 -B = ?
T2 C + D
T3 T1 * T2
A T3 = ?
```

Output:



Steps to compile and Run the c program

First u have to create input.txt file where u are executing your c program file

Note: input.txt and file_name.c should be in same folder(directory)

To Compile c Program : gcc file_name.c

After the successful compilation of the c program the a.exe and output.txt file is generated automatically

To Run c Program : a.exe

To see the output.txt file Type output.txt in the command prompt

Note: you have to go location where u have safed the file(i.e c Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

6 a) Write a LEX program to eliminate *comment lines* in a *C* program and copy the resulting program into a separate file

Lex program

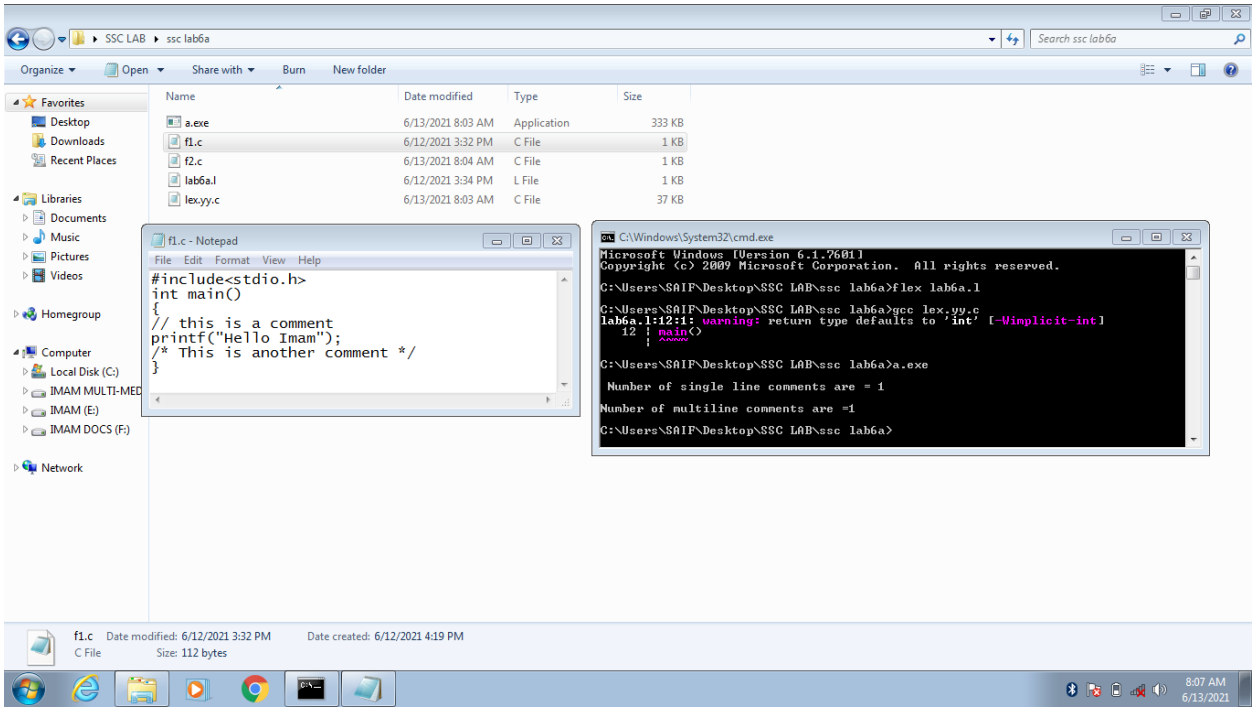
```
%option noyywrap
%{
#include<stdio.h>
int sl=0;
int ml=0;
%}
%%
"/*"[a-zA-Z0-9' '\t\n]+"*/"         ml++;
"//".*  sl++;
%%


main()
{
        yyin=fopen("f1.c","r");
        yyout=fopen("f2.c","w");
        yylex();
        fclose(yyin);
        fclose(yyout);
        printf("\n Number of single line comments are = %d\n",sl);
printf("\nNumber of multiline comments are =%d\n",ml);
```

}

F1.c program

```
#include<stdio.h>
int main()
{
// this is a comment
printf("Hello Imam");
/* This is another comment */
}
```

Output:



Steps to compile and Run the Lex program

To Compile Lex Program : flex file_name.l

After the successful compilation of the lex program the lex.yy.c file is generated automatically

To Run Lex Program : gcc lex.yy.c

After the successful Run of the lex program the a.exe file is generated automatically

To see the output of Lex program type a.exe in the command prompt

To Execute:a.exe

Note: you have to go location where u have safed the file(i.e Lex Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

6 b) Write YACC program to recognize valid *identifier, operators and keywords* in the given text (*C program*) file.

Lex program

```
%option noyywrap

%{

#include <stdio.h>

#include "y.tab.h"

extern yylval;

%}


%%

[ \t];

[+|-|*|/|=|<|>] {printf("operator is %s\n",yytext);return OP;}

[0-9]+ {yylval = atoi(yytext); printf("numbers is %d\n",yylval); return DIGIT;}

int|char|bool|float|void|for|do|while|if|else|return|void {printf("keyword is %s\n",yytext);return KEY;}

[a-zA-Z0-9]+ {printf("identifier is %s\n",yytext);return ID;}

. ;

%%
```

Yacc program

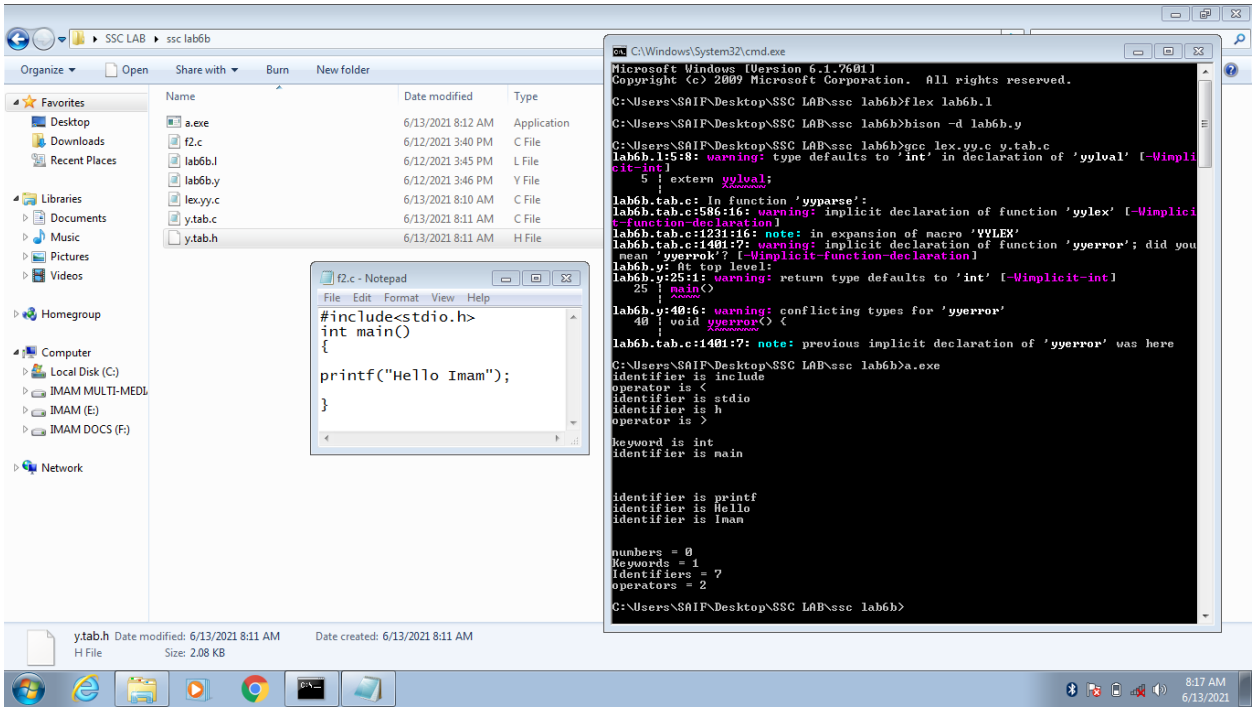
```
%{
#include <stdio.h>
#include <stdlib.h>
int id=0, dig=0, key=0, op=0;
%}
%token DIGIT ID KEY OP

%%
input:
DIGIT input { dig++; }
| ID input { id++; }
| KEY input { key++; }
| OP input {op++;}
| DIGIT { dig++; }
| ID { id++; }
| KEY { key++; }
| OP { op++;}
;
%%

#include <stdio.h>
extern int yylex();
```

```
extern int yyparse();
extern FILE *yyin;
main()
{
	FILE *myfile = fopen("f2.c", "r");
	if (!myfile)
	{
		printf("I can't open f2.c!");
		return -1;
	}
	yyin = myfile;
	do{
		yyparse();
	}while (!feof(yyin));
	printf("numbers = %d\nKeywords = %d\nIdentifiers = %d\noperators =
%d\n",dig, key,id, op);
}

void yyerror() {
	printf("EEK, parse error! Message: ");
	exit(-1);
}
```

F2.c program

```
#include<stdio.h>

int main()

{


printf("Hello Imam");


}
```

Output:



Steps to compile and Run the Lex and Yacc program

To Compile Lex Program : flex file_name.l

After the successful compilation of the lex program the lex.yy.c file is generated automatically

To Compile Yacc program : bison –d filename.y

After the successful compilation of the yacc program the 2 files is generated automatically namely

1 file_name.tab.c and

2 file name.tab.h

Rename that 2 files to y.tab.c and y.tab.h

To Run Lex and Yacc Program : gcc lex.yy.c y.tab.c

After the successful Run of the lex and Yacc program the a.exe file is generated automatically

To see the output of Lex and Yacc program type a.exe in the command prompt

To Execute:a.exe

Note: you have to go location where u have safed the files(i.e Lex and Yacc Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

7. Design, develop and implement a C/C++/Java program to simulate the working of Shortest remaining time and Round Robin (RR) scheduling algorithms. Experiment with different quantum sizes for RR algorithm.

C program

```
#include<stdio.h>

int main()

{

        int count,j,n,time,flag=0,time_quantum,ch=0;

        int wait_time=0,turnaround_time=0,at[10],bt[10],rt[10];

        int endTime,i,smallest;

        int remain=0,sum_wait=0,sum_turnaround=0;

        printf("1.Round Robin \n2.SRTF \n");

        scanf("%d",&ch);

        printf("Enter no of Processes : ");

        scanf("%d",&n);

        for(i=0;i<n;i++)

        {

                printf("Enter arrival time for Process P%d : ",i+1);

                scanf("%d",&at[i]);

                printf("Enter burst time for Process P%d :",i+1);

                scanf("%d",&bt[i]);

                rt[i]=bt[i];
```

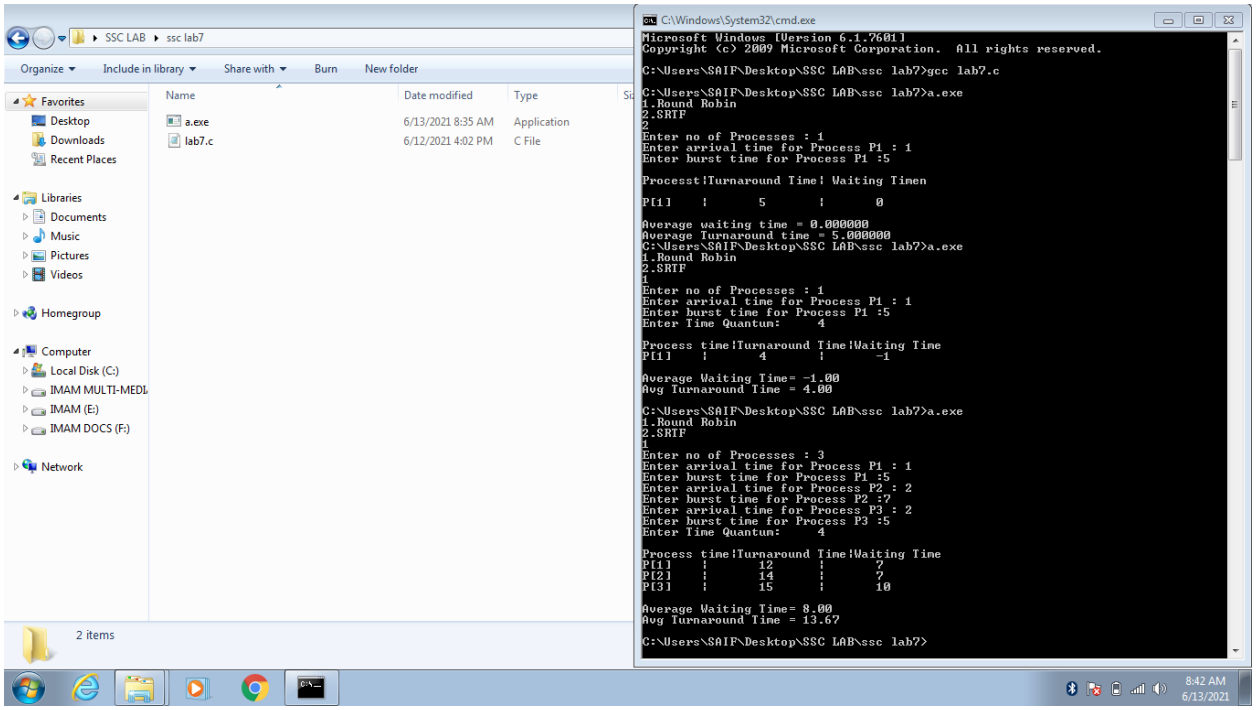
```
}
switch(ch)
{
        case 1:
        printf("Enter Time Quantum:\t");
        scanf("%d",&time_quantum);
        remain=n;
        printf("\nProcess time|Turnaround Time|Waiting Time\n");
        for(time=0,count=0;remain!=0;)
        {
                if(rt[count]<=time_quantum && rt[count]>0)
                {
                        time+=rt[count];
                        rt[count]=0;
                        flag=1;
                }
                else if(rt[count]>0)
                {
                        rt[count]-=time_quantum;
                        time+=time_quantum;
                }
                if(rt[count]==0 && flag==1)
```

```
                {
                        remain--;
                        printf("P[%d]\t|\t%d\t|\t%d\n",count+1,time-
at[count],time-at[count]-bt[count]);
                        wait_time+=time-at[count]-bt[count];
                        turnaround_time+=time-at[count];
                        flag=0;
                }
                if(count==n-1)
                        count=0;
                else if(at[count+1]<=time)
                        count++;
                else
                        count=0;
        }
        printf("\nAverage Waiting Time= %.2f\n",wait_time*1.0/n);
        printf("Avg Turnaround Time = %.2f\n",turnaround_time*1.0/n);
        break;
        case 2:
        remain=0;
        printf("\nProcesst|Turnaround Time| Waiting Timen\n");
        rt[9]=9999;
```

```
for(time=0;remain!=n;time++)
{
    smallest=9;
    for(i=0;i<n;i++)
        if(at[i]<=time && rt[i]<rt[smallest] && rt[i]>0)
            smallest=i;
    rt[smallest]--;
    if(rt[smallest]==0)
    {
        remain++;
        endTime=time+1;
        printf("\nP[%d]\t|\t%d\t|\t%d",smallest+1,endTime-
at[smallest],endTime-bt[smallest]-at[smallest]);
        printf("\n");
        sum_wait+=endTime-bt[smallest]-at[smallest];
        sum_turnaround+=endTime-at[smallest];
    }
}
printf("\nAverage waiting time = %f\n",sum_wait*1.0/n);
printf("Average Turnaround time = %f",sum_turnaround*1.0/n);
break;
default:
```

```
            printf("Invalid\n");
        }
        return 0;
}
```

Output:



Steps to compile and Run the C program

To Compile c Program : gcc file_name.c

After the successful compilation of the c program the a.exe file is generated automatically

To Run c Program : a.exe

Note: you have to go location where u have safed the file(i.e c Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

8. Design, develop and implement a C/C++/Java program to implement Banker's algorithm. Assume suitable input required to demonstrate the results.

C program

```
#include <stdio.h>

#include <stdlib.h>

int main()

{

        int Max[10][10], need[10][10], alloc[10][10], avail[10], completed[10],
safeSequence[10];

        int p, r, i, j, process, count;

        count = 0;

        printf("Enter the no of processes : ");

        scanf("%d", &p);

        for(i = 0; i< p; i++)

                completed[i] = 0;

        printf("Enter the no of resources : ");

        scanf("%d", &r);

        printf("Enter the Max Matrix for each process : ");

        for(i = 0; i < p; i++)

        {

                printf("\nFor process %d : ", i + 1);

                for(j = 0; j < r; j++)
```

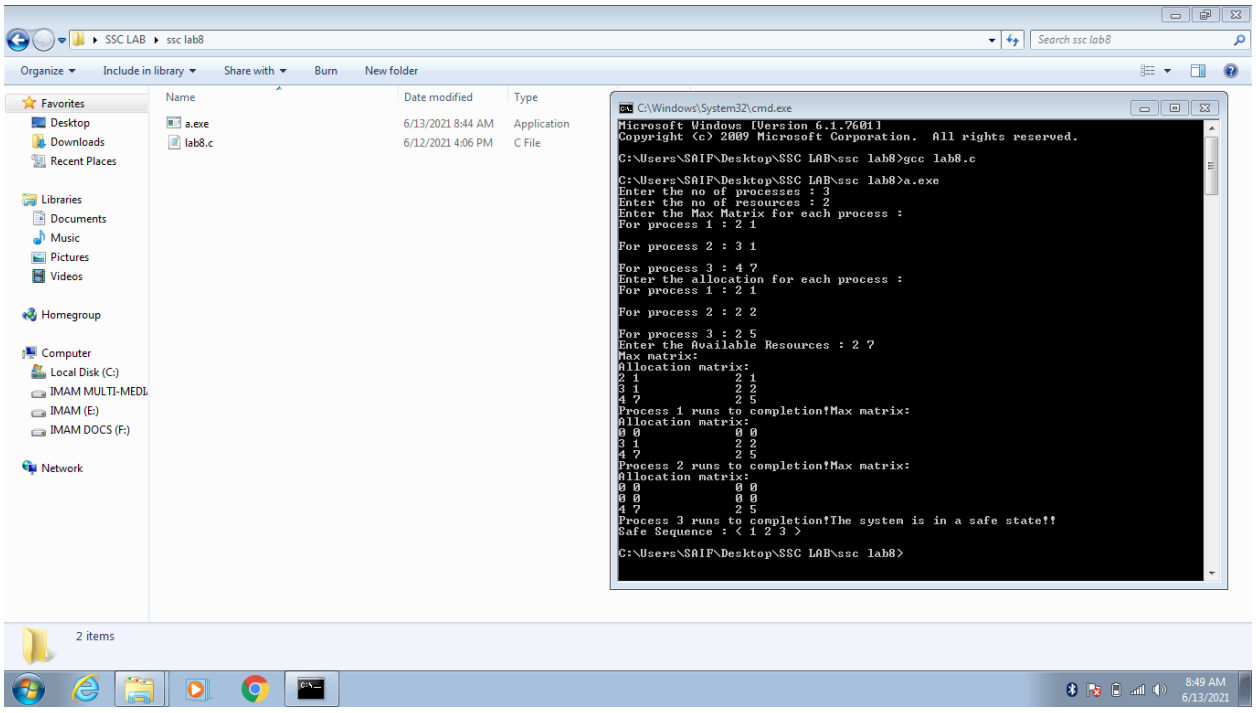
```
                scanf("%d", &Max[i][j]);
}
printf("Enter the allocation for each process : ");
for(i = 0; i < p; i++)
{
        printf("\nFor process %d : ",i + 1);
        for(j = 0; j < r; j++)
                scanf("%d", &alloc[i][j]);
}
printf("Enter the Available Resources : ");
for(i = 0; i < r; i++)
        scanf("%d", &avail[i]);
for(i = 0; i < p; i++)
        for(j = 0; j < r; j++)
                need[i][j] = Max[i][j] - alloc[i][j];
do
{
        printf("Max matrix:\t\nAllocation matrix:\n");
        for(i = 0; i < p; i++)
        {
                for( j = 0; j < r; j++)
                        printf("%d ", Max[i][j]);
```

```
        printf("\t\t");
        for( j = 0; j < r; j++)
                printf("%d ", alloc[i][j]);
        printf("\n");
}
process = -1;
for(i = 0; i < p; i++)
{
        if(completed[i] == 0)//if not completed
        {
                process = i ;
                for(j = 0; j < r; j++)
                {
                        if(avail[j] < need[i][j])
                        {
                                process = -1;
                                break;
                        }
                }
        }
        if(process != -1)
        break;
```

```
        }
        if(process != -1)
        {
                printf("Process %d runs to completion!", process + 1);
                safeSequence[count] = process + 1;
                count++;
                for(j = 0; j < r; j++)
                {
                        avail[j] += alloc[process][j];
                        alloc[process][j] = 0;
                        Max[process][j] = 0;
                        completed[process] = 1;
                }
        }
}
while(count != p && process != -1);
if(count == p)
{
        printf("The system is in a safe state!!\n");
        printf("Safe Sequence : < ");
        for( i = 0; i < p; i++)
                printf("%d ", safeSequence[i]);
```

```
            printf(">\n");
        }
        else
            printf("The system is in an unsafe state!!");
}
```

Output:



Steps to compile and Run the c program

To Compile c Program : gcc file_name.c

After the successful compilation of the c program the a.exe file is generated automatically

To Run c Program : a.exe

Note: you have to go location where u have safed the file(i.e c Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.

9. Design, develop and implement a C/C++/Java program to implement page replacement algorithms LRU and FIFO. Assume suitable input required to demonstrate the results.

C program

```
#include<stdio.h>

#include<stdlib.h>


void FIFO(char [ ],char [ ],int,int);

void lru(char [ ],char [ ],int,int);

void opt(char [ ],char [ ],int,int);


int main()

{

   int ch,YN=1,i,l,f;

   char F[10],s[25];

   printf("\nEnter the no of empty frames: ");

   scanf("%d",&f);

   printf("\nEnter the length of the string: ");

   scanf("%d",&l);

   printf("\nEnter the string: ");

   scanf("%s",s);

   for(i=0;i<f;i++)
```

```
    F[i]=-1;

do
{
    printf("\n********** MENU **********");
    printf("\n1:FIFO\n2:LRU \n3:EXIT");
    printf("\nEnter your choice: ");
    scanf("%d",&ch);

    switch(ch)
    {
        case 1: for(i=0;i<f;i++)
                    F[i]=-1;
                FIFO(s,F,l,f);
                break;

        case 2: for(i=0;i<f;i++)
                    F[i]=-1;
                lru(s,F,l,f);
                break;

        case 3: exit(0);
```

```
        }
        printf("\n\nDo u want to continue IF YES PRESS 1\nIF NO PRESS 0 : ");
        scanf("%d",&YN);
    } while(YN==1);
    return(0);
}

//FIFO
void FIFO(char s[],char F[],int l,int f)
{
    int i,j=0,k,flag=0,cnt=0;
    printf("\n\tPAGE\t       FRAMES\t\t\t FAULTS");
    for(i=0;i<l;i++)
    {
        for(k=0;k<f;k++)
        {
            if(F[k]==s[i])
                flag=1;
        }

        if(flag==0)
        {
```

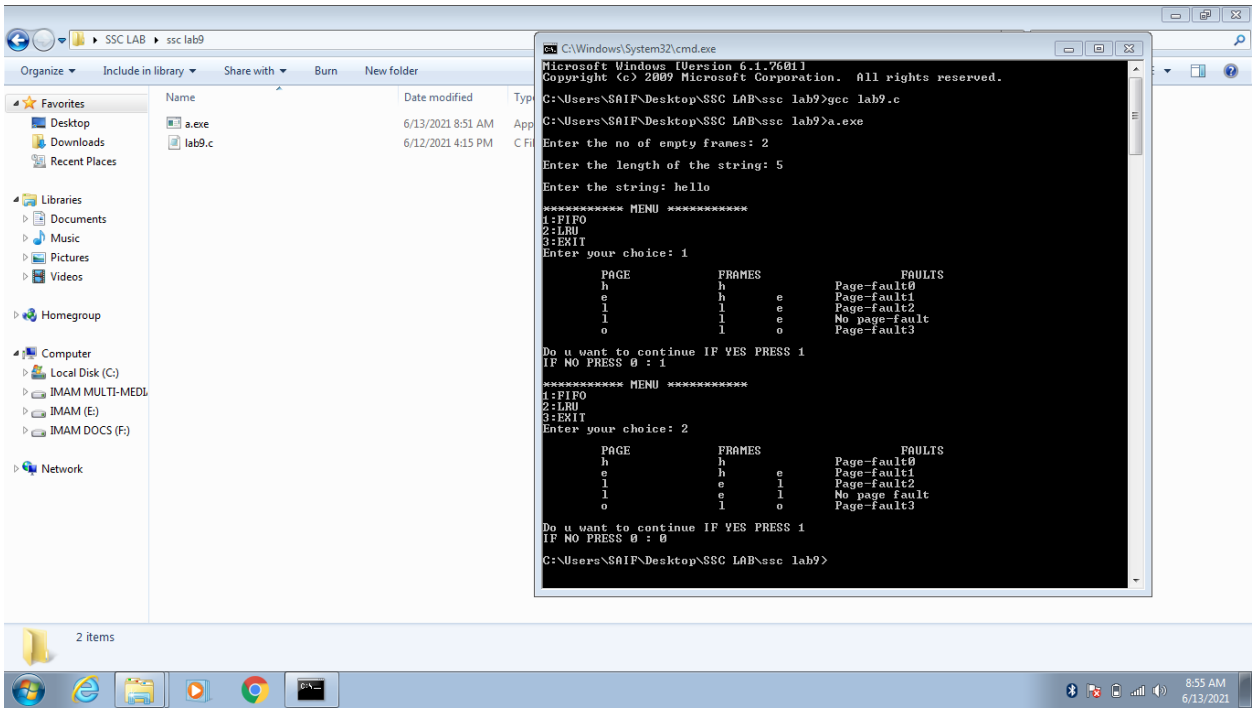
```
            printf("\n\t%c\t",s[i]);
            F[j]=s[i];
            j++;
            for(k=0;k<f;k++)
                printf("     %c",F[k]);
            printf("\tPage-fault%d",cnt);
            cnt++;
        }

        else
        {
            flag=0;
            printf("\n\t%c\t",s[i]);
            for(k=0;k<f;k++)
                printf("     %c",F[k]);
            printf("\tNo page-fault");
        }
        if(j==f)
            j=0;
    }
}
```

```
//LRU
void lru(char s[],char F[],int l,int f)
{
   int i,j=0,k,m,flag=0,cnt=0,top=0;
   printf("\n\tPAGE\t       FRAMES\t\t\t FAULTS");
   for(i=0;i<l;i++)
   {
      for(k=0;k<f;k++)
      {
         if(F[k]==s[i])
         {
            flag=1;
            break;
         }
      }
      printf("\n\t%c\t",s[i]);
      if(j!=f && flag!=1)
      {
         F[top]=s[i];
         j++;
         if(j!=f)
            top++;
```

```
}

else
{
   if(flag!=1)
   {
      for(k=0;k<top;k++)
         F[k]=F[k+1];
      F[top]=s[i];
   }

   if(flag==1)
   {
      for(m=k;m<top;m++)
         F[m]=F[m+1];
      F[top]=s[i];
   }
}

for(k=0;k<f;k++)
   printf("        %c",F[k]);
```

```
        if(flag==0)
        {
            printf("\tPage-fault%d",cnt);
            cnt++;
        }
        else
            printf("\tNo page fault");
        flag=0;
    }
}
```

Output:



Steps to compile and Run the c program

To Compile c Program : gcc file_name.c

After the successful compilation of the c program the a.exe file is generated automatically

To Run c Program : a.exe

Note: you have to go location where u have safed the file(i.e c Program) and open the command prompt there only. And then compile, run and execute the program.

All steps are shown in the above output picture.