```
/*****************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Design a lexical analyzer for given language and the Lexical analyzer should ignore
redundant spaces, tabs and new lines
*****************************************************************************/
#include <stdio.h>  //header file
#include <string.h> //header file
int main()          // main function
{
   int c = 1, i, j = 0; // declaring variables
   char file_name[20], s[20];
   scanf("%s", file_name);
   FILE *fp;
   fp = fopen(file_name, "r");
   if (fp == NULL) // if condition
   {
      printf("Failed to open the file");
   }
   else // else condition
   {
      do
      {
         fscanf(fp, "%s", s);
         if (s[0] == '#' && s[7] == 'e')
         {
            printf("%s : is a Header file\n", s);
         }
         else if (!strcmp(s, "+") || !strcmp(s, "-") || !strcmp(s, "*") || !strcmp(s, "/") || !strcmp(s, ">") ||
                  !strcmp(s, "<") || !strcmp(s, "=") || !strcmp(s, "<=") || !strcmp(s, ">=") || !strcmp(s, "!") ||
                  !strcmp(s, "!=") ||
                  !strcmp(s, "==") || !strcmp(s, "++") || !strcmp(s, "--") || !strcmp(s, "&") || !strcmp(s, "|") ||
                  !strcmp(s, "||") || !strcmp(s, "&&") ||
                  !strcmp(s, "%"))
         {
            printf("%s : is an Operator\n", s);
         }
         else if (!strcmp(s, "auto") || !strcmp(s, "break") || !strcmp(s, "case") || !strcmp(s, "char") ||
                  !strcmp(s, "const") ||
                  !strcmp(s, "continue") || !strcmp(s, "default") || !strcmp(s, "do") || !strcmp(s, "double") ||
                  !strcmp(s, "else") ||
                  !strcmp(s, "enum") || !strcmp(s, "extern") || !strcmp(s, "float") || !strcmp(s, "for") ||
                  !strcmp(s, "goto") || !strcmp(s, "if") || !strcmp(s, "int") ||
                  !strcmp(s, "long") || !strcmp(s, "register") || !strcmp(s, "return") || !strcmp(s, "short") ||
                  !strcmp(s, "signed") ||
                  !strcmp(s, "sizeof") || !strcmp(s, "static") || !strcmp(s, "struct") || !strcmp(s, "switch") ||
```

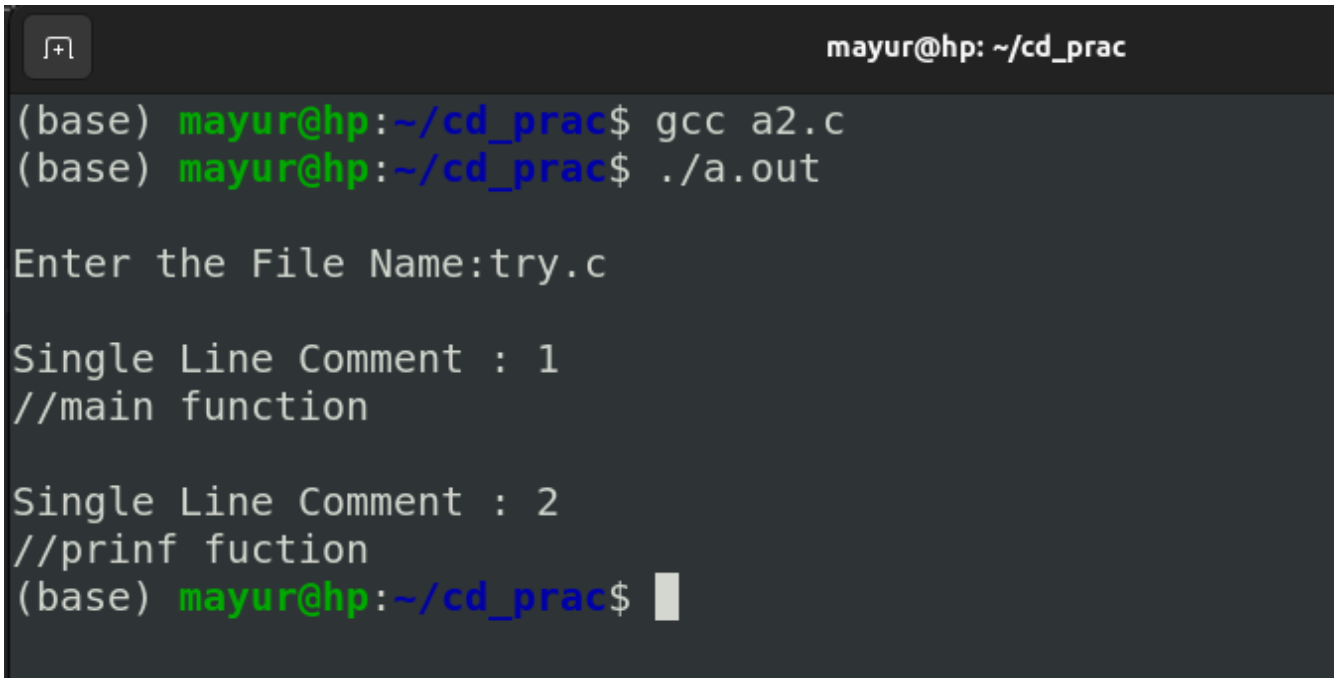
```
            !strcmp(s, "typedef") ||
            !strcmp(s, "union") || !strcmp(s, "unsigned") || !strcmp(s, "void") || !strcmp(s, "volatile") ||
            !strcmp(s, "while"))
        {
            printf("%s : is a Keyword\n", s);
        }
        else if (!strcmp(s, "\""))
        {
            fscanf(fp, "%s", s);
            while (strcmp(s, "\""))
            {
                printf("%s ", s);
                fscanf(fp, "%s", s);
            }
            printf(": is an Argument\n");
        }
        else if (!strcmp(s, "scanf") || !strcmp(s, "printf") || !strcmp(s, "main"))
        {
            printf("%s : is an Identifier\n", s);
        }
        else if (!strcmp(s, ",") || !strcmp(s, ";") || !strcmp(s, "{") || !strcmp(s, "}") || !strcmp(s, "(") ||
            !strcmp(s, ")"))
        {
            continue;
        }
        else
        {
            printf("%s : is an Identifier\n", s);
        }
    } while (c != EOF);
  }
  fclose(fp);
  return 0;
}
```

**********Output**********


mayur@hp: ~/cd_prac
(base) mayur@hp:~/cd_prac$ ls
a1 a1.c a.out try.c
(base) mayur@hp:~/cd_prac$ ./a.out
try.c
#include<stdio.h> is a Header file
//main is an Identifier
function is an Identifier
int is a Keyword
main(){ is an Identifier
//prinf is an Identifier
fuction is an Identifier
printf("Hello"); is an Identifier

```
/*******************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Write a C program to identify whether a given line is comment or not.
*******************************************************************************/
#include <stdio.h> //header file
void main()       // main function
{
   char source_file[30], ch, ch1, ch2, ch3, ch4;
   int i = 0, j = 0;
   FILE *source; // file pointer
   printf("\nEnter the File Name:");
   scanf("%s", source_file);
   source = fopen(source_file, "r");
   if (source == NULL)
   {
      printf("File does not exists");
   }
   /*
   While Loop
   */
   while ((ch = getc(source)) != EOF)
   {
      if (ch == '/')
      {
         ch1 = getc(source);
         if (ch1 == '/' || ch1 == '*')
         {
            if (ch1 == '/')
            {
               i++;
               printf("\nSingle Line Comment : %d", i);
               printf("\n%c%c", ch, ch1);
               while ((ch2 = getc(source)) != '\n')
               {
                  printf("%c", ch2);
               }
               printf("\n");
            }
            else
            {
               j++;
               printf("\nMultiline comment : %d", j);
               printf("\n%c%c", ch, ch1);
               while ((ch3 = getc(source)) != '*')
               {
```

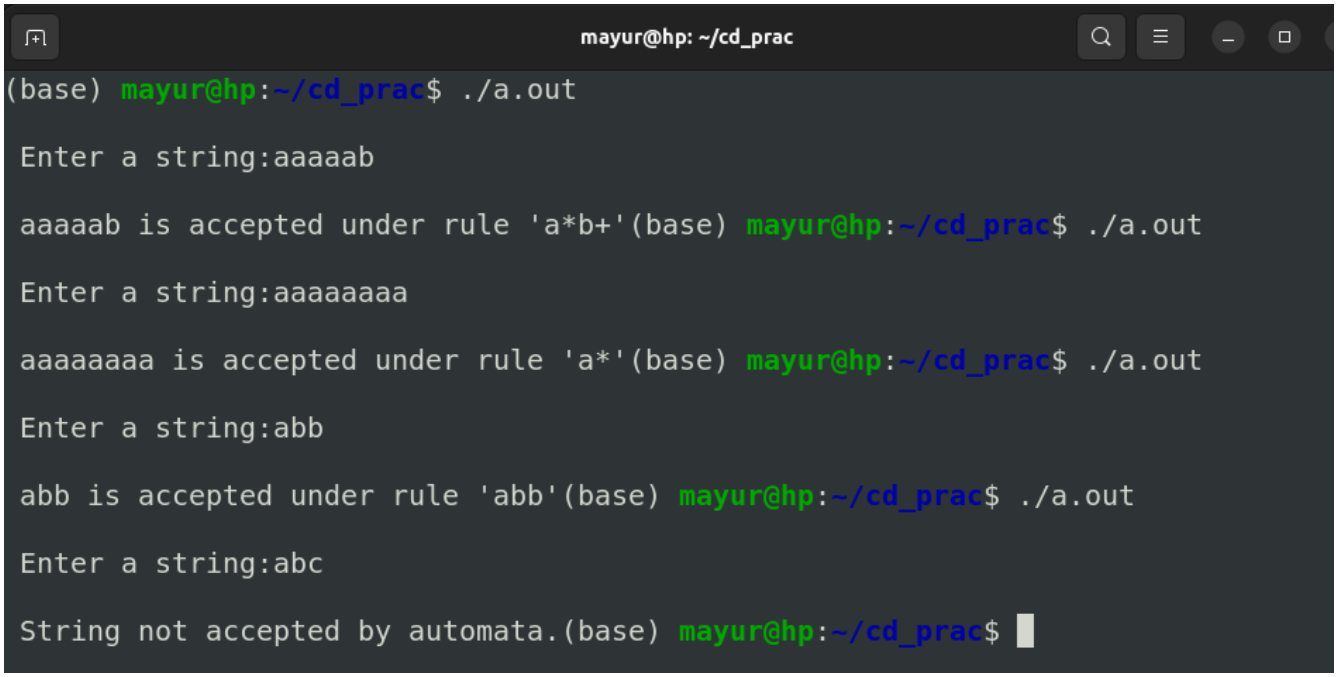
```
                printf("%c", ch3);
            }
            printf("%c", ch3);
            if ((ch4 = getc(source)) == '/')
                printf("%c\n", ch4);
        }
    }
  }
  /*
  End Of While Loop
  */
}
**********output**********/
```



```
/*******************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Write a C program to recognize strings under 'a*','a*b+', 'abb'.
*******************************************************************************/
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
void main()
{
   char s[20], c;
   int state = 0, i = 0;
   printf("\n Enter a string:");
   gets(s);
   while (s[i] != '\0')
   {
      switch (state)
      {
      case 0:
         c = s[i++];
         if (c == 'a')
            state = 1;
         else if (c == 'b')
            state = 2;
         else
            state = 6;
         break;
      case 1:
         c = s[i++];
         if (c == 'a')
            state = 3;
         else if (c == 'b')
            state = 4;
         else
            state = 6;
         break;
      case 2:
         c = s[i++];
         if (c == 'a')
            state = 6;
         else if (c == 'b')
            state = 2;
         else
            state = 6;
         break;
      case 3:
```

```
            c = s[i++];
            if (c == 'a')
               state = 3;
            else if (c == 'b')
               state = 2;
            else
               state = 6;
            break;
         case 4:
            c = s[i++];
            if (c == 'a')
               state = 6;
            else if (c == 'b')
               state = 5;
            else
               state = 6;
            break;
         case 5:
            c = s[i++];
            if (c == 'a')
               state = 6;
            else if (c == 'b')
               state = 2;
            else
               state = 6;
            break;
         case 6:
            printf("\n %s is not recognised.", s);
            exit(0);
         }
      }
      if ((state == 1) || (state == 3))
         printf("\n %s is accepted under rule 'a*'", s);
      else if ((state == 2) || (state == 4))
         printf("\n %s is accepted under rule 'a*b+'", s);
      else if (state == 5)
         printf("\n %s is accepted under rule 'abb'", s);
      else
         printf("\n String not accepted by automata.");
   }
```

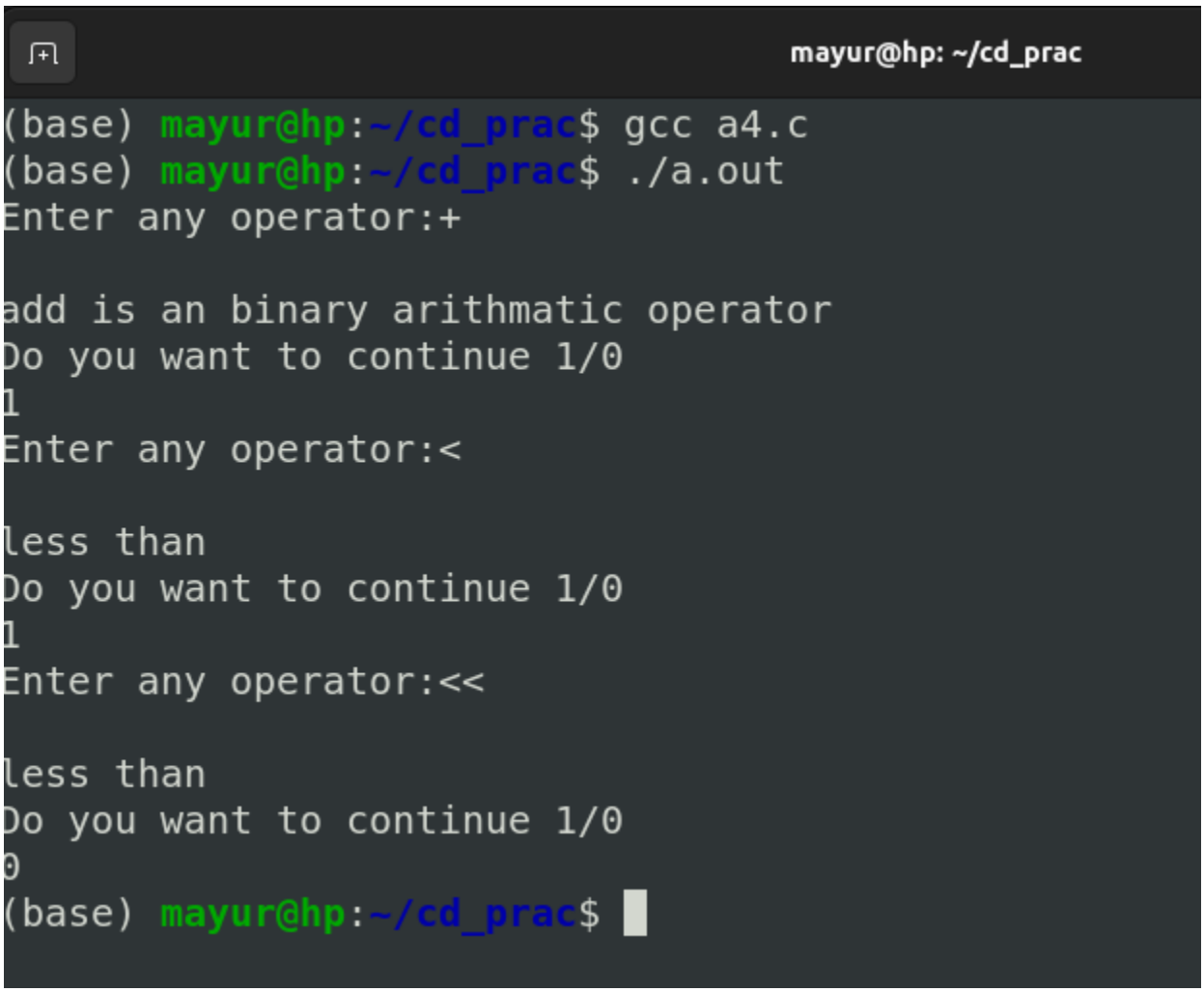
**********Output**********


mayur@hp: ~/cd_prac
(base) mayur@hp:~/cd_prac$ ./a.out
Enter a string:aaaaab
aaaaab is accepted under rule 'a*b+'(base) mayur@hp:~/cd_prac$ ./a.out
Enter a string:aaaaaaaa
aaaaaaaa is accepted under rule 'a*'(base) mayur@hp:~/cd_prac$ ./a.out
Enter a string:abb
abb is accepted under rule 'abb'(base) mayur@hp:~/cd_prac$ ./a.out
Enter a string:abc
String not accepted by automata.(base) mayur@hp:~/cd_prac$

```
/*******************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Write a C program to simulate lexical analyzer for validating operators.
*******************************************************************************/
#include <stdio.h>
int main()
{
   char s[10];
   int c;
   do
   {
      printf("Enter any operator:");
      scanf("%s", s);
      switch (s[0])
      {
      case '<':
         if (s[1] == '=')
            printf("\nless than or equal\n");
         else
            printf("\nless than");
         break;
      case '>':
         if (s[1] == '=')
            printf("\ngreater than or equal");
         else
            printf("\ngreater than");
         break;
      case '+':
         if (s[1] == '+')
            printf("\nunary increament operator");
         else
            printf("\nadd is an binary arithmatic operator");
         break;
      case '-':
         if (s[1] == '-')
            printf("\nunary decreament operator");
         else
            printf("\nminus is an binary arithmatic operator");
         break;
      case '/':
         if (s[1] == '*')
            printf("\nit is not an operator");
         else
            printf("\ndivision is an binary arithmatic operator");
         break;
```

```
        case '*':
            printf("\nmultiplication is an binary arithmatic operator");
            break;
        case '%':
            printf("\nmodulus is an arithmatic operator");
            break;
        case '!':
            if (s[1] == '=')
                printf("\nnot equal");
            else
                printf("\nbit not");
            break;
        case '=':
            if (s[1] == '=')
                printf("\nit is an comparison operator");
            else printf("\nassignment operator");
            break;
        case '&':
            if (s[1] == '&')
                printf("\nlogical AND");
            else
                printf("\nBitwise AND");
            break;
        case '|':
            if (s[1] == '|')
                printf("\nlogical OR");
            else
                printf("\nBitwise OR");
            break;
        case '~':
            printf("\nnegation operator");
            break;
        case '?':
            if (s[1] == ':')
                printf("\nternary operator is an unary operator");
            else
                printf("\nnot an operator");
            break;
        default:
            printf("\nInvalid input!!");
            break;
        }
        printf("\nDo you want to continue 1/0\n");
        scanf("%d", &c);
    } while (c == 1);
    return (0);
}
```

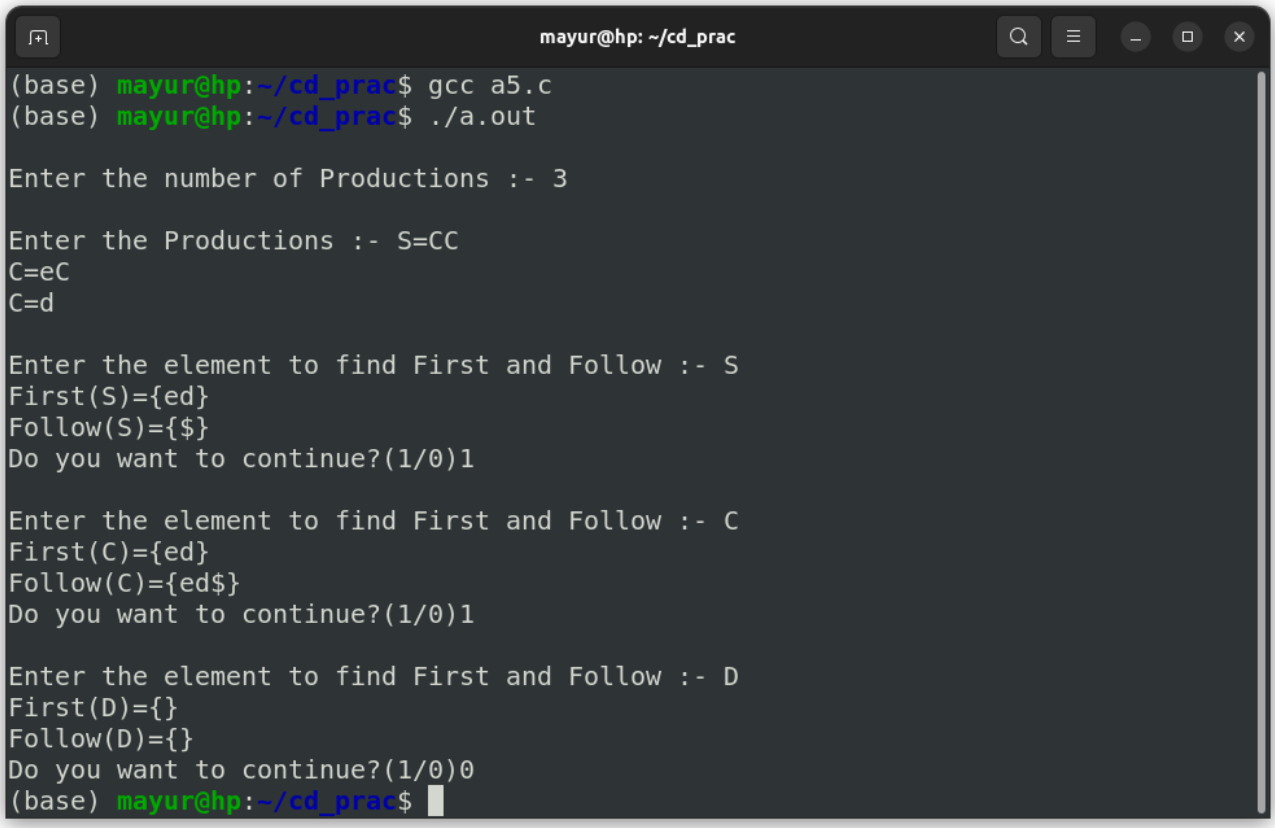
**********Output**********/


mayur@hp: ~/cd_prac
(base) mayur@hp:~/cd_prac$ gcc a4.c
(base) mayur@hp:~/cd_prac$ ./a.out
Enter any operator:+
add is an binary arithmatic operator
Do you want to continue 1/0
1
Enter any operator:<
less than
Do you want to continue 1/0
1
Enter any operator:<<
less than
Do you want to continue 1/0
0
(base) mayur@hp:~/cd_prac$

```
/*********************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Simulate First and Follow of a Grammar.
*********************************************************************************/
#include <stdio.h>
#include <string.h>
int numOfProd;
char prods[10][10], f[10];
int m = 0;
void first(char a);
void follow(char a);
int main()
{
   printf("\nEnter the number of Productions :- ");
   scanf("%d", &numOfProd);
   printf("\nEnter the Productions :- ");
   for (int i = 0; i < numOfProd; i++)
      scanf("%s", prods[i]);
   int choice;
   char choi;
   do
   {
      m = 0;
      printf("\nEnter the element to find First and Follow :- ");
      getchar();
      scanf("%c", &choi);
      first(choi);
      printf("First(%c)={", choi);
      for (int i = 0; i < m; i++)
         printf("%c", f[i]);
      printf("}\n");
      strcpy(f, " ");
      m = 0;
      follow(choi);
      printf("Follow(%c)={", choi);
      for (int i = 0; i < m; i++)
         printf("%c", f[i]);
      printf("}\n");
      printf("Do you want to continue?(1/0)");
      scanf("%d", &choice);
   } while (choice == 1);
   return 0;
}
void first(char a)
{
```

```
    if ((a >= 'a' && a <= 'z') || a == '$')
    {
        f[m++] = a;
    }
    for (int k = 0; k < numOfProd; k++)
    {
        if (prods[k][0] == a)
        {
            if (prods[k][2] == '$')
                follow(prods[k][0]);
            else if ((prods[k][2] >= 'a' && prods[k][2] <= 'z') || prods[k][2] == '$')
                f[m++] = prods[k][2];
            else
                first(prods[k][2]);
        }
    }
}
void follow(char a)
{
    if (prods[0][0] == a)
        f[m++] = '$';
    for (int i = 0; i < numOfProd; i++)
    {
        for (int j = 2; j < strlen(prods[i]); j++)
        {
            if (prods[i][j] == a)
            {
                if (prods[i][j + 1] != '\0')
                    first(prods[i][j + 1]);
                if (prods[i][j + 1] == '\0' && a != prods[i][0])
                    follow(prods[i][0]);
            }
        }
    }
}
```

**********Output**********

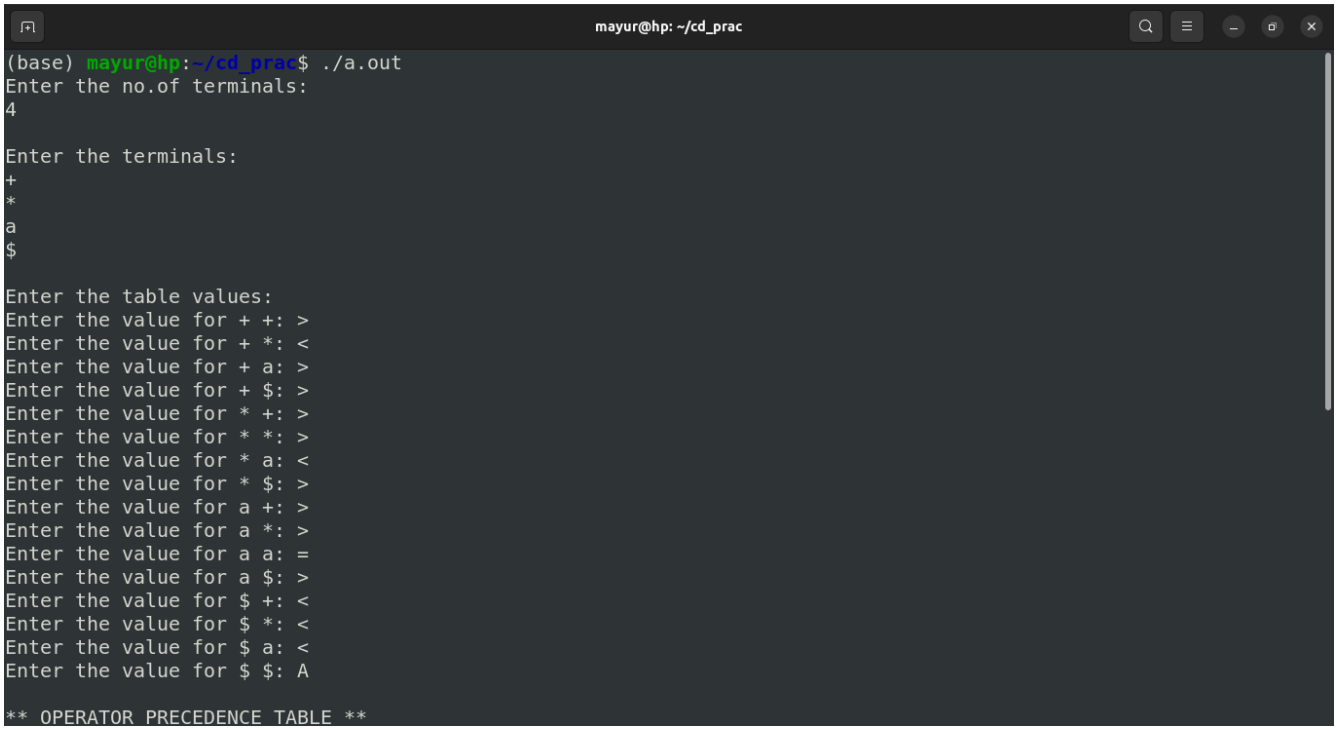

mayur@hp: ~/cd_prac
(base) mayur@hp:~/cd_prac$ gcc a5.c
(base) mayur@hp:~/cd_prac$ ./a.out
Enter the number of Productions :- 3
Enter the Productions :- S=CC
C=eC
C=d
Enter the element to find First and Follow :- S
First(S)={ed}
Follow(S)={$}
Do you want to continue?(1/0)1
Enter the element to find First and Follow :- C
First(C)={ed}
Follow(C)={ed$}
Do you want to continue?(1/0)1
Enter the element to find First and Follow :- D
First(D)={}
Follow(D)={}
Do you want to continue?(1/0)0
(base) mayur@hp:~/cd_prac$

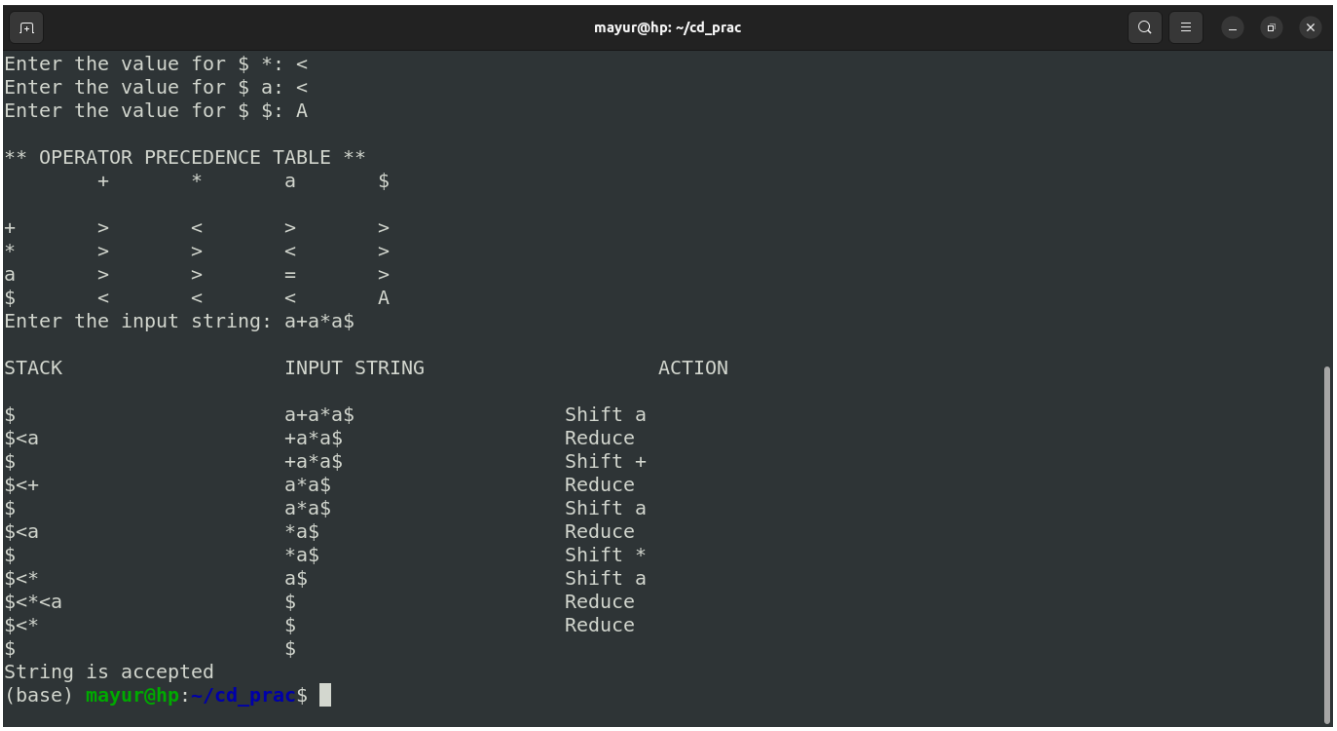
```
/*******************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Write a C program to implement operator precedence parsing
*******************************************************************************/
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int main()
{
   char stack[20], ip[20], opt[10][10][1], ter[10];
   int i, j, k, n, top = 0, col, row;
   for (i = 0; i < 10; i++)
   {
      stack[i] = NULL;
      ip[i] = NULL;
      for (j = 0; j < 10; j++)
      {
         opt[i][j][1] = NULL;
      }
   }
   printf("Enter the no.of terminals:\n");
   scanf("%d", &n);
   printf("\nEnter the terminals:\n");
   for (i = 0; i < n; i++)
   {
      scanf("%s", &ter[i]);
   }
   printf("\nEnter the table values:\n");
   for (i = 0; i < n; i++)
   {
      for (j = 0; j < n; j++)
      {
         printf("Enter the value for %c %c: ", ter[i], ter[j]);
         scanf("%s", opt[i][j]);
      }
   }
   printf("\n** OPERATOR PRECEDENCE TABLE **\n");
   for (i = 0; i < n; i++)
   {
      printf("\t%c", ter[i]);
   }
   printf("\n");
   for (i = 0; i < n; i++)
   {
      printf("\n%c", ter[i]);
```

```
    for (j = 0; j < n; j++)
    {
        printf("\t%c", opt[i][j][0]);
    }
}
stack[top] = '$';
printf("\nEnter the input string: ");
scanf("%s", ip);
i = 0;
printf("\nSTACK\t\t\tINPUT STRING\t\t\tACTION\n");
printf("\n%s\t\t\t%s\t\t\t", stack, ip);
while (i <= strlen(ip))
{
    for (k = 0; k < n; k++)
    {
        if (stack[top] == ter[k])
            col = k;
        if (ip[i] == ter[k])
            row = k;
    }
    if ((stack[top] == '$') && (ip[i] == '$'))
    {
        printf("\nString is accepted\n");
        break;
    }
    else if ((opt[col][row][0] == '<') || (opt[col][row][0] == '='))
    {
        stack[++top] = opt[col][row][0];
        stack[++top] = ip[i];
        printf("Shift %c", ip[i]);
        i++;
    }
    else
    {
        if (opt[col][row][0] == '>')
        {
            while (stack[top] != '<')
            {
                --top;
            }
            top = top - 1;
            printf("Reduce");
        }
        else
        {
            printf("\nString is not accepted");
            break;
        }
    }
```

```
        printf("\n");
        for (k = 0; k <= top; k++)
        {
           printf("%c", stack[k]);
        }
        printf("\t\t\t");
        for (k = i; k < strlen(ip); k++)
        {
           printf("%c", ip[k]);
        }
        printf("\t\t\t");
    }
}
```

**********Output**********



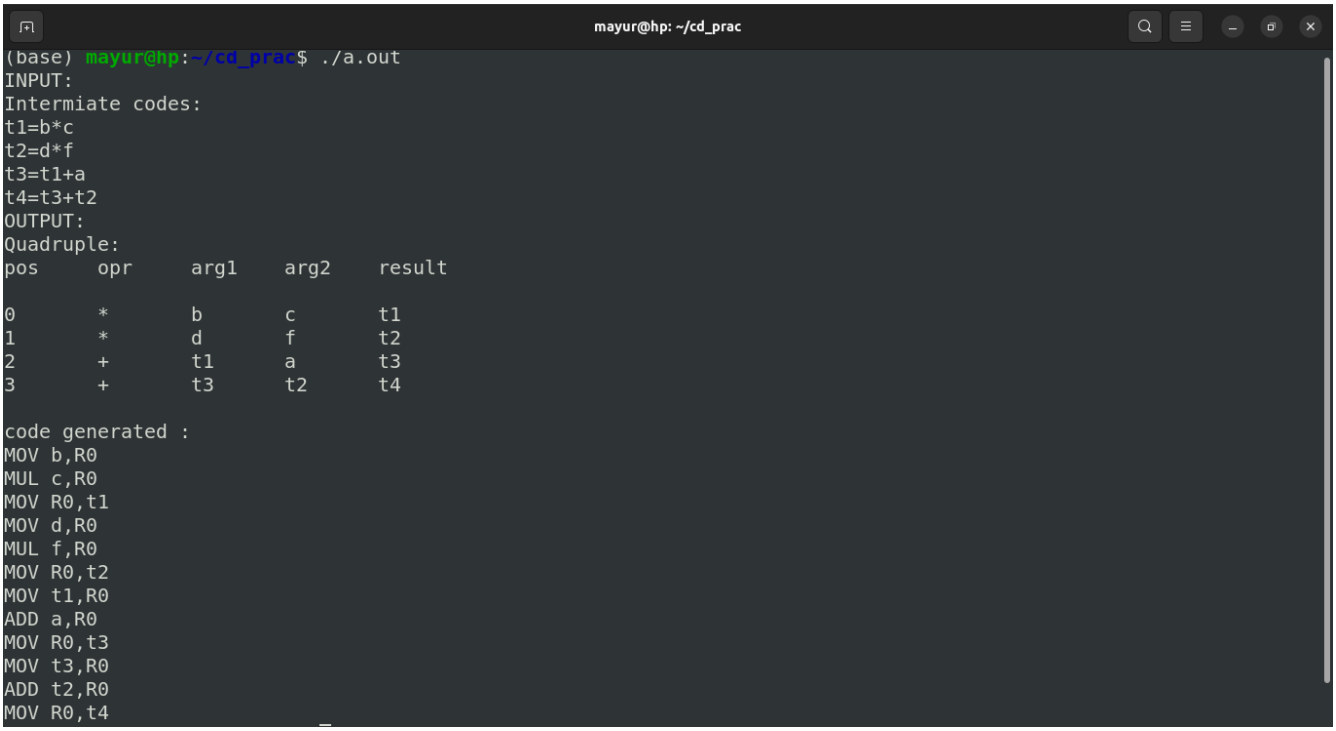

mayur@hp: ~/cd_prac
Enter the value for $ *: <
Enter the value for $ a: <
Enter the value for $ $: A
** OPERATOR PRECEDENCE TABLE **
+ * a $
+ > < > >
* > > < >
a > > = >
$ < < < A
Enter the input string: a+a*a$
STACK INPUT STRING ACTION
$ a+a*a$ Shift a
$<a +a*a$ Reduce
$ +a*a$ Shift +
$<+ a*a$ Reduce
$ a*a$ Shift a
$<a *a$ Reduce
$ *a$ Shift *
$<* a$ Shift a
$<*<a $ Reduce
$<* $ Reduce
$ $
String is accepted
(base) mayur@hp:~/cd_prac$

```
/*****************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Write a C program to generate machine code from abstract syntax tree generated by the
parser.
*****************************************************************************/
#include <stdio.h>
// #include<conio.h>
#include <string.h>
#include <stdlib.h>
struct quadraple
{
   int pos;
   char op;
   char arg1[5];
   char arg2[5];
   char result[5];
} quad[15];
int n = 0;
void assignment(int);
void uminus(int);
void explore();
void codegen(char op[5], int);
char tuple[15][15];
int main(void)
{
   FILE *src;
   int nRetInd, i;
   char str[15];
   // clrscr();
   src = fopen("code.txt", "r");
   fscanf(src, "%s", str);
   while (!feof(src))
   {
      strcpy(tuple[n++], str);
      fscanf(src, "%s", str);
   }
   printf("INPUT:\nIntermiate codes:\n");
   for (i = 0; i < n; i++)
      printf("%s\n", tuple[i]);
   explore();
   // getch();
   // clrscr();
   printf("OUTPUT:\n");
   printf("Quadruple: \n");
   printf("pos\topr\targ1\targ2\tresult\n");
```

```
    for (i = 0; i < n; i++)
        printf("\n%d\t%c\t%s\t%s\t%s", quad[i].pos, quad[i].op, quad[i].arg1, quad[i].arg2,
quad[i].result);
    i = 0;
    printf("\n\ncode generated :\n");
    while (i < n)
    {
        if (quad[i].op == '+')
            codegen("ADD", i);
        if (quad[i].op == '=')
            assignment(i);
        if (quad[i].op == '-')
            if (!strcmp(quad[i].arg2, "\0"))
                uminus(i);
            else
                codegen("SUB", i);
        if (quad[i].op == '*')
            codegen("MUL", i);
        if (quad[i].op == '/')
            codegen("DIV", i);
        i++;
    }
    // getch();
    fcloseall();
    return 0;
}
void codegen(char op[5], int t)
{
    char str[25];
    printf("MOV %s,R0\n", quad[t].arg1);
    printf("%s %s,R0\n", op, quad[t].arg2);
    printf("MOV R0,%s\n", quad[t].result);
}
void assignment(int t)
{
    char str[25];
    printf("MOV %s,%s\n", quad[t].arg1, quad[t].result);
}
void uminus(int t)
{
    char str[25];
    printf("MOV R0,0\n");
    printf("SUB %s,R0\n", quad[t].arg1);
    printf("MOV R0,%s\n", quad[t].result);
}
void explore()
{
    int i, j, t, t1, t2;
    for (i = 0; i < n; i++)
```

```
   {
      quad[i].pos = i;
      for (j = 0, t = 0; j < strlen(tuple[i]) && tuple[i][j] != '='; j++)
      {
         quad[i].result[t++] = tuple[i][j];
      }
      t1 = j;
      quad[i].result[t] = '\0';
      if (tuple[i][j] == '=')
      {
         quad[i].op = '=';
      }
      if (tuple[i][j + 1] == '+' || tuple[i][j + 1] == '-' || tuple[i][j + 1] == '*' || tuple[i][j + 1] == '/')
      {
         quad[i].op = tuple[i][j + 1];
         t1 = j + 1;
      }
      for (j = t1 + 1, t = 0; j < strlen(tuple[i]) && tuple[i][j] != '+' && tuple[i][j] != '-' && tuple[i]
[j] != '*' && tuple[i][j] != '/'; j++)
      {
         quad[i].arg1[t++] = tuple[i][j];
      }
      t2 = j;
      quad[i].arg1[t] = '\0';
      if (tuple[i][j] == '+' || tuple[i][j] == '-' || tuple[i][j] == '*' || tuple[i][j] == '/')
      {
         quad[i].op = tuple[i][j];
      }
      for (j = t2 + 1, t = 0; j < strlen(tuple[i]); j++)
      {
         quad[i].arg2[t++] = tuple[i][j];
      }
      quad[i].arg2[t] = '\0';
   }
}
```

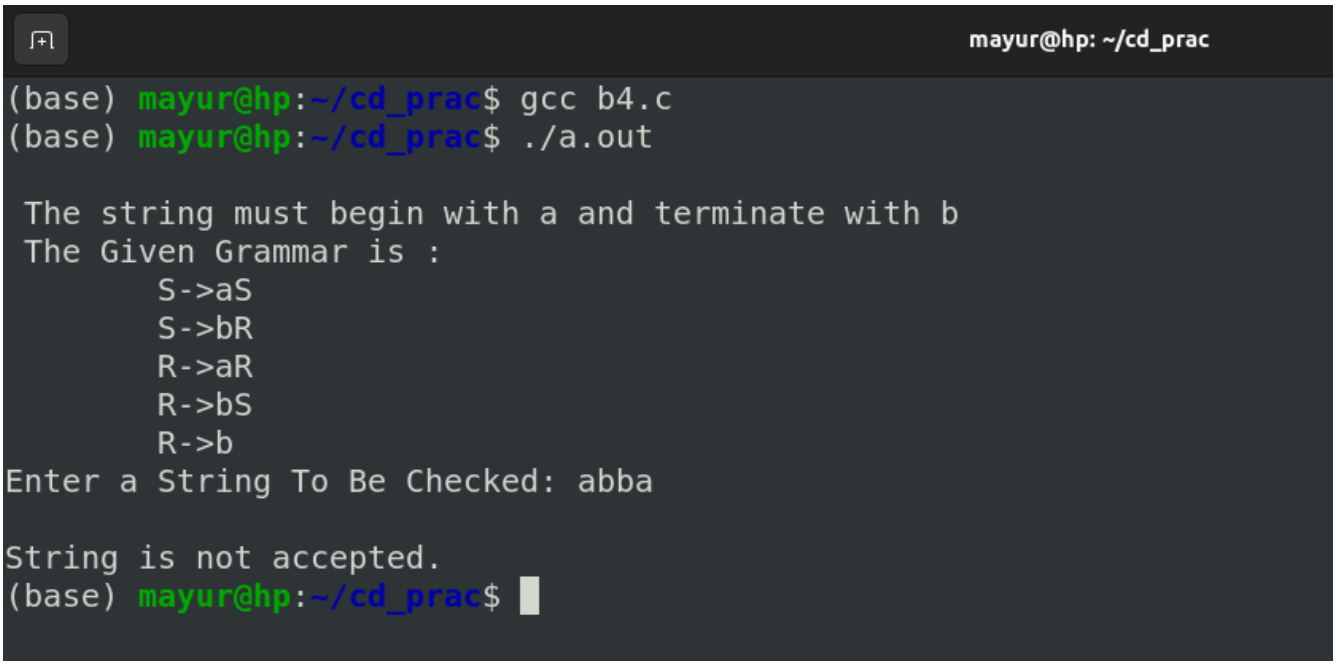
**********Output**********


mayur@hp: ~/cd_prac
(base) mayur@hp:~/cd_prac$ ./a.out
INPUT:
Intermiate codes:
t1=b*c
t2=d*f
t3=t1+a
t4=t3+t2
OUTPUT:
Quadruple:
pos opr arg1 arg2 result
0 * b c t1
1 * d f t2
2 + t1 a t3
3 + t3 t2 t4
code generated :
MOV b,R0
MUL c,R0
MOV R0,t1
MOV d,R0
MUL f,R0
MOV R0,t2
MOV t1,R0
ADD a,R0
MOV R0,t3
MOV t3,R0
ADD t2,R0
MOV R0,t4

```
/*******************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Write a C program to check whether a string belongs to grammar or not.
*******************************************************************************/
#include <string.h>
#include <stdio.h>
int main()
{
   int c;
   char string[20];
   int state = 0, count = 0;
   printf("\n The string must begin with a and terminate with b"); printf("\n The Given Grammar is :\n
");
      printf("\tS->aS \n\tS->bR \n\tR->aR \n\tR->bS \n\tR->b\n"); printf("Enter a String To Be
Checked: ");
scanf("%s",string);
while(string[count]!='\0')
{
      switch (state)
      {
      case 0:
         if (string[count] == 'a')
            state = 1;
         else
            state = 3;
         break;
      case 1:
         if (string[count] == 'a')
            state = 1;
         else if (string[count] == 'b')
            state = 2;
         else
            state = 3;
         break;
      case 2:
         if (string[count] == 'b')
            state = 2;
         else
            state = 3;
         break;
      default:
         break;
      }
      count++;
      if (state == 3)
```

```
        break;
}
if(state==2)
printf("\nString is accepted.\n");
else
printf("\nString is not accepted.\n");
return 0;
}
```

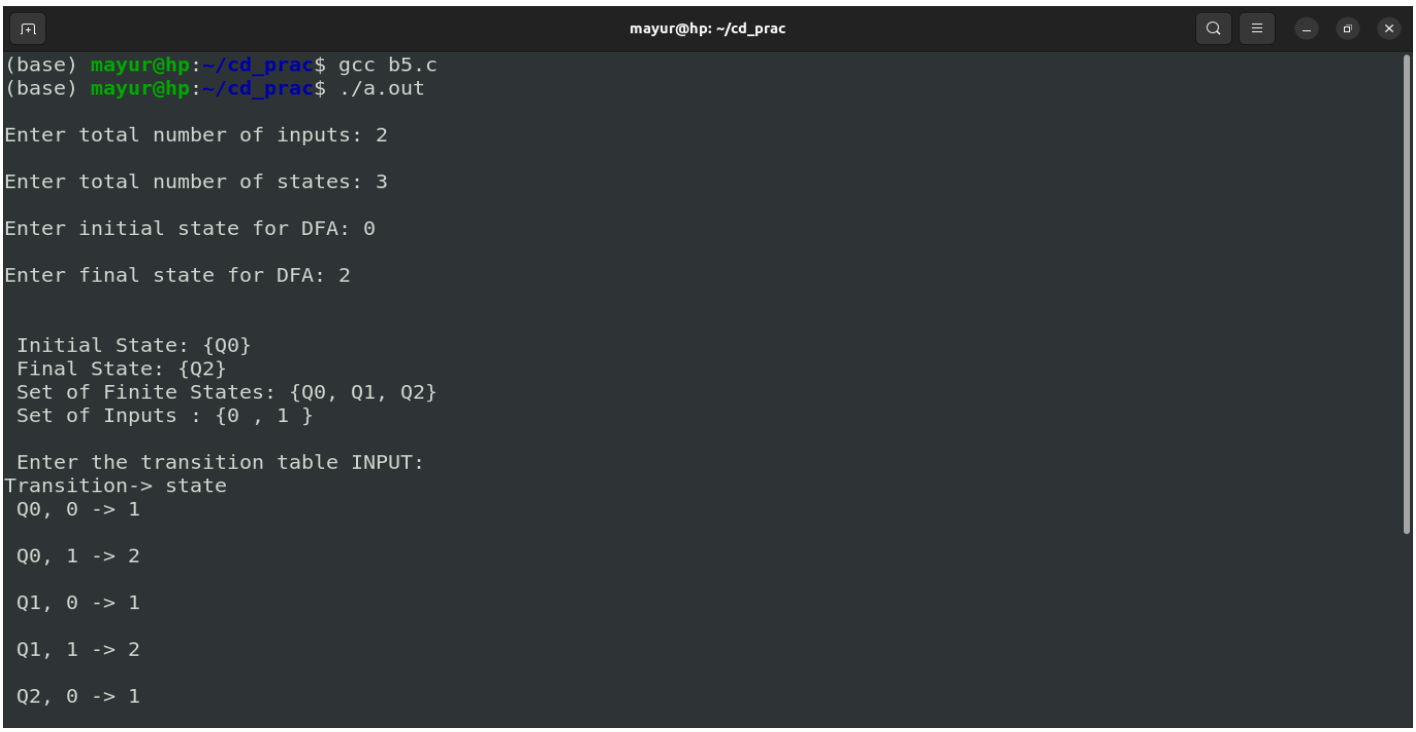
**********Output**********



```
/*******************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Implementation of Deterministic Finite Automata.
*******************************************************************************/
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int main(int argc, char **argv)
{
   int a, b, s, x, i, len, Q[100][100], initial, final;
   char str[100], c[2];
   printf("\nEnter total number of inputs: ");
   scanf("%d", &i);
   printf("\nEnter total number of states: ");
   scanf("%d", &s);
   printf("\nEnter initial state for DFA: ");
   scanf("%d", &initial);
   printf("\nEnter final state for DFA: ");
   scanf("%d", &final);
   printf("\n\n Initial State: {Q%d}", initial);
   printf("\n Final State: {Q%d}", final);
   printf("\n Set of Finite States: {");
   for (a = 0; a < s; a++)
   {
      printf("Q%d", a);
      if (a < s - 1)
         printf(", ");
   }
   printf("}");
   printf("\n Set of Inputs : {");
   for (a = 0; a < i; a++)
   {
      printf("%d ", a);
      if (a < i - 1)
         printf(", ");
   }
   printf("}\n\n");
   printf(" Enter the transition table INPUT:\n");
   printf("Transition-> state");
   for (a = 0; a < s; a++)
   {
      for (b = 0; b < i; b++)
      {
         printf("\n Q%d, %d -> ", a, b);
         scanf("%d", &Q[a][b]);
```

```
        }
    }
    do
    {
        printf("\nEnter the string to check: ");
        scanf("%s", str);
        len = strlen(str);
        c[1] = '\0';
        x = initial;
        printf("\n -> Q0");
        for (a = 0; a < len; a++)
        {
            c[0] = str[a];
            x = Q[x][atoi(c)];
            printf(" --%d--> Q%d", atoi(c), x);
        }
        if (x == final)
            printf("\n\n***[String Accepted for this grammar]***\n\n");
        else
            printf("\n\n###[String Not Accepted]###\n\n");
        printf("Do you want to check another string [Yes = 1 / No = 0]: ");
        scanf("%d", &a);
    } while (a);
    return 0;
}
```

/**********Output**********?

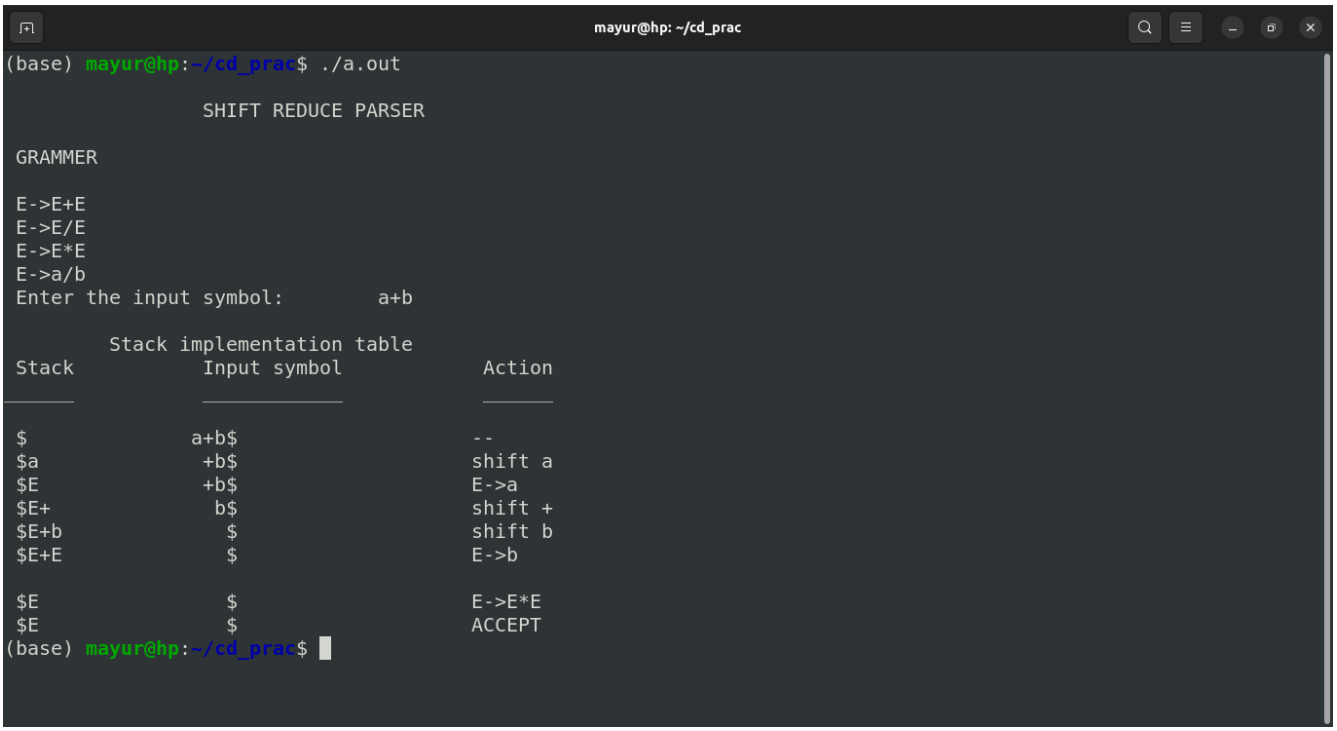


```
Enter the string to check: 110101

 -> Q0 --1--> Q2 --1--> Q2 --0--> Q1 --1--> Q2 --0--> Q1 --1--> Q2

***[String Accepted for this grammar]***

Do you want to check another string [Yes = 1 / No = 0]: 0
(base) mayur@hp:~/cd_prac$
```

```
/*****************************************************************************
Name: Mayur Prakash Mali
PRN: 1941032
Batch: B3
Class: L.Y. B.Tech.
Sub: CDL
Aim: Implementation of shift reduce parsing algorithm.
*****************************************************************************/
#include <stdio.h> //including header files
#include <stdlib.h>
#include <string.h>
char ip_sym[15], stack[15]; // declaring global variables
int ip_ptr = 0, st_ptr = 0, len, i;
char temp[2], temp2[2];
char act[15];
void check(); // declaring function
void main()   // defining main
{
   printf("\n\t\t SHIFT REDUCE PARSER\n");
   printf("\n GRAMMER\n"); // defining grammar
   printf("\n E->E+E\n E->E/E");
   printf("\n E->E*E\n E->a/b");
   printf("\n Enter the input symbol:\t");
   gets(ip_sym); // take input string
   printf("\n\t Stack implementation table");
   printf("\n Stack\t\t Input symbol\t\t Action");
   // construct parse table
   printf("\n______\t\t _____________\t\t ______\n");
   printf("\n $\t\t%s$\t\t\t--", ip_sym);
   strcpy(act, "shift ");
   temp[0] = ip_sym[ip_ptr];
   temp[1] = '\0';
   strcat(act, temp);
   len = strlen(ip_sym);
   for (i = 0; i <= len - 1; i++) // using for loop
   {
      stack[st_ptr] = ip_sym[ip_ptr]; // inserting in stack
      stack[st_ptr + 1] = '\0';
      ip_sym[ip_ptr] = ' ';
      ip_ptr++;
      printf("\n $%s\t\t%s$\t\t\t%s", stack, ip_sym, act);
      strcpy(act, "shift ");
      temp[0] = ip_sym[ip_ptr];
      temp[1] = '\0';
      strcat(act, temp);
      check(); // checking with grammar
      st_ptr++;
   }
   st_ptr++;
```

```
    check();
}
void check() // function definition
{
    int flag = 0;
    temp2[0] = stack[st_ptr];
    temp2[1] = '\0';
    if ((!strcmp(temp2, "a")) || (!strcmp(temp2, "b")))
    {
        stack[st_ptr] = 'E';
        if (!strcmp(temp2, "a")) // checking for third production
            printf("\n $%s\t\t%s$\t\t\tE->a", stack, ip_sym);
        else
            printf("\n $%s\t\t%s$\t\t\tE->b\n", stack, ip_sym);
        flag = 1;
    }
    if ((!strcmp(temp2, "+")) || (strcmp(temp2, "*")) || (!strcmp(temp2, "/")))
    {
        flag = 1;
    }
    if ((!strcmp(stack, "E+E")) || (!strcmp(stack, "E\E")) || (!strcmp(stack, "E*E")))
    {
        strcpy(stack, "E");
        st_ptr = 0;
        if (!strcmp(stack, "E+E")) // using if condition
            printf("\n $%s\t\t%s$\t\t\tE->E+E", stack, ip_sym);
        else if (!strcmp(stack, "E\E"))
            printf("\n $%s\t\t %s$\t\t\tE->E\E", stack, ip_sym);
        else
            printf("\n $%s\t\t%s$\t\t\tE->E*E", stack, ip_sym);
        flag = 1;
    }
    if (!strcmp(stack, "E") && ip_ptr == len)
    {
        printf("\n $%s\t\t%s$\t\t\tACCEPT\n", stack, ip_sym);
        exit(0);
    }
    if (flag == 0)
    {
        printf("\n%s\t\t\t%s\t\t reject\n", stack, ip_sym);
        exit(0);
    }
    return;
}
```

**********Output**********


mayur@hp: ~/cd_prac
(base) mayur@hp:~/cd_prac$ ./a.out
SHIFT REDUCE PARSER
GRAMMER
E->E+E
E->E/E
E->E*E
E->a/b
Enter the input symbol: a+b
Stack implementation table
Stack Input symbol Action
$ a+b$ --
$a +b$ shift a
$E +b$ E->a
$E+ b$ shift +
$E+b $ shift b
$E+E $ E->b
$E $ E->E*E
$E $ ACCEPT
(base) mayur@hp:~/cd_prac$