/**

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Class : L.Y.B.TECH.
Batch : B1
Sub : CCL
Aim : Write a C program to check whether a string belongs to grammar or not.

**/

PROGRAM 1:

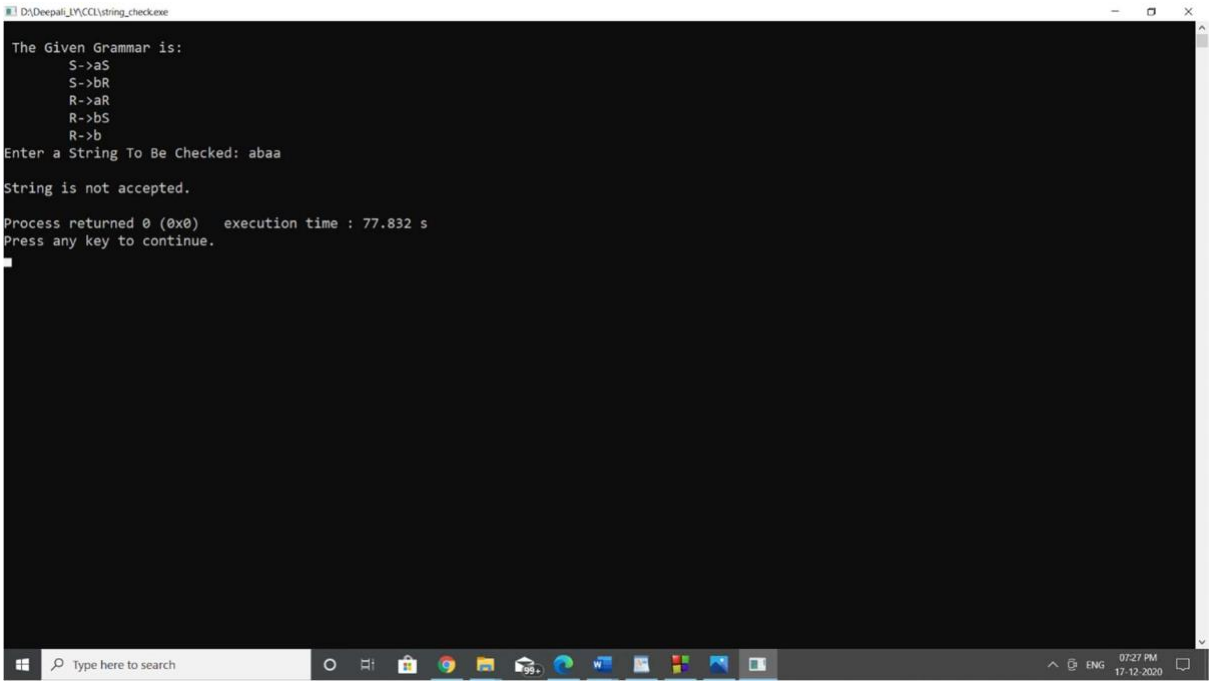
```
#include<string.h>
#include<stdio.h> int main() {
int c;  char string[20];  int
state=0,count=0;
 //printf("\n The string must begin with a and terminate with b");  printf("\n The Given Grammar is:\n");
printf("\tS->aS \n\tS->bR \n\tR->aR \n\tR->bS \n\tR->b\n");  printf("Enter a String To
Be Checked: ");  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 :



PROGRAM 2:

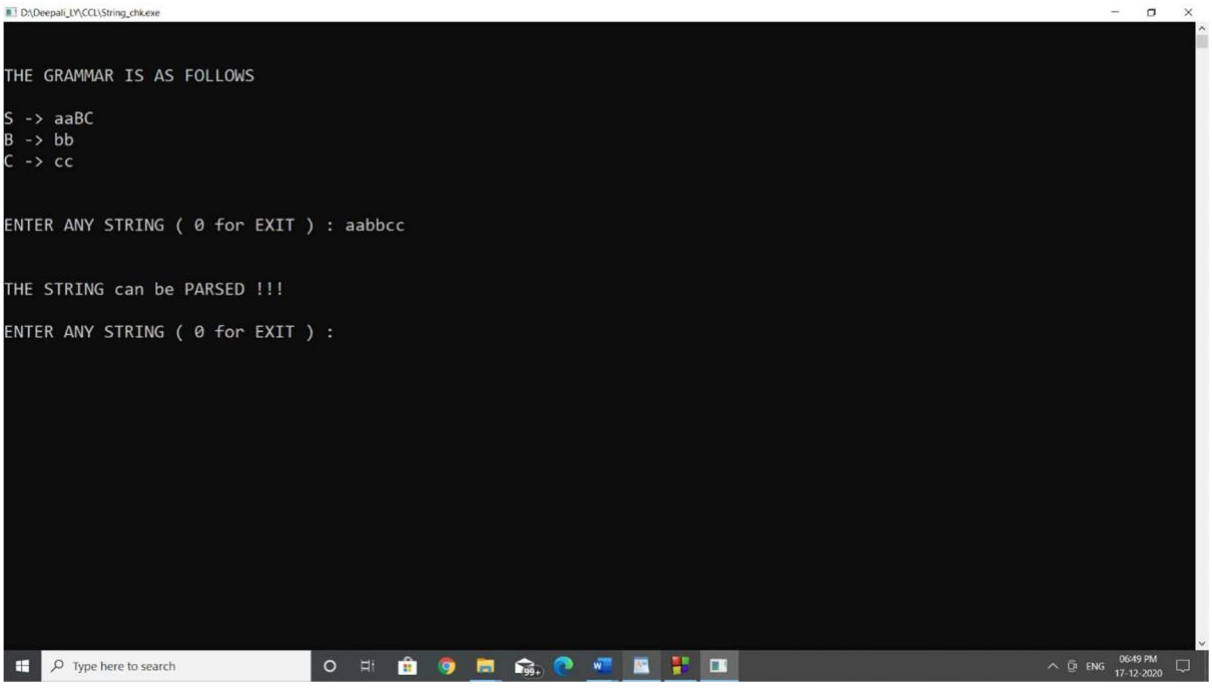
#include<stdio.h> #include<string.h> int

i,j,k,l,m,n=0,o,p,nv,z=0,t,x=0; char

```
str[10],temp[20],temp2[20],temp3[20]; struct prod {     char
lhs[10],rhs[10][10];     int n; }pro[10]; void findter()
{     for(k=0;k<n;k++)
   {       if(temp[i]==pro[k].lhs[0])
      {             for(t=0;t<pro[k].n;t++)
         {                for(l=0;l<20;l++)                    temp2[l]='\0';
for(l=i+1;l<strlen(temp);l++)                    temp2[l-i-1]=temp[l];
for(l=i;l<20;l++)                    temp[l]='\0';
for(l=0;l<strlen(pro[k].rhs[t]);l++)                    temp[i+l]=pro[k].rhs[t][l];
strcat(temp,temp2);                if(str[i]==temp[i])                    return;
            else if(str[i]!=temp[i] && temp[i]>=65 && temp[i]<=90)                 break;
         }            break;        }
}     if(temp[i]>=65 &&
temp[i]<=90)        findter();
} void main() {
   FILE *f;
   //clrscr();
    for(i=0;i<10;i++)
pro[i].n=0;
    f=fopen("grammar.txt","r");
while(!feof(f))
   {        fscanf(f,"%s",pro[n].lhs);        if(n>0)        {            if(
strcmp(pro[n].lhs,pro[n-1].lhs) == 0 )
         {                pro[n].lhs[0]='\0';                fscanf(f,"%s",pro[n-1].rhs[pro[n-
1].n]);
                        pro[n-1].n++;
            continue;
         }        }        fscanf(f,"%s",pro[n].rhs[pro[n].n]);
pro[n].n++;        n++;     }     printf("\n\nTHE GRAMMAR IS AS
FOLLOWS\n\n");     for(i=0;i<n;i++)        for(j=0;j<pro[i].n;j++)
                        printf("%s -> %s\n",pro[i].lhs,pro[i].rhs[j]);     while(1)     {
for(l=0;l<10;l++)            str[0]=NULL;        printf("\n\nENTER ANY STRING ( 0 for
EXIT ) : ");    scanf("%s",str);        if(str[0]=='0')            break;// exit(1);
for(j=0;j<pro[0].n;j++)
```

```
      {           for(l=0;l<20;l++)              temp[l]=NULL;
strcpy(temp,pro[0].rhs[j]);
                    m=0;
         for(i=0;i<strlen(str);i++)
         {              if(str[i]==temp[i])
m++;
            else if(str[i]!=temp[i] && temp[i]>=65 && temp[i]<=90)            {
                              findter();
              if(str[i]==temp[i])                  m++;
}
            else if( str[i]!=temp[i] && (temp[i]<65 || temp[i]>90) )                  break;
         }          if(m==strlen(str) && strlen(str)==strlen(temp))
         {              printf("\n\nTHE STRING can be PARSED !!!");              break;
         }
      }       if(j==pro[0].n)          printf("\n\nTHE STRING can NOT be PARSED
!!!");
   }
}
```

OUTPUT:



INPUT FILE: grammar.txt

S aaBC
B bb
C cc

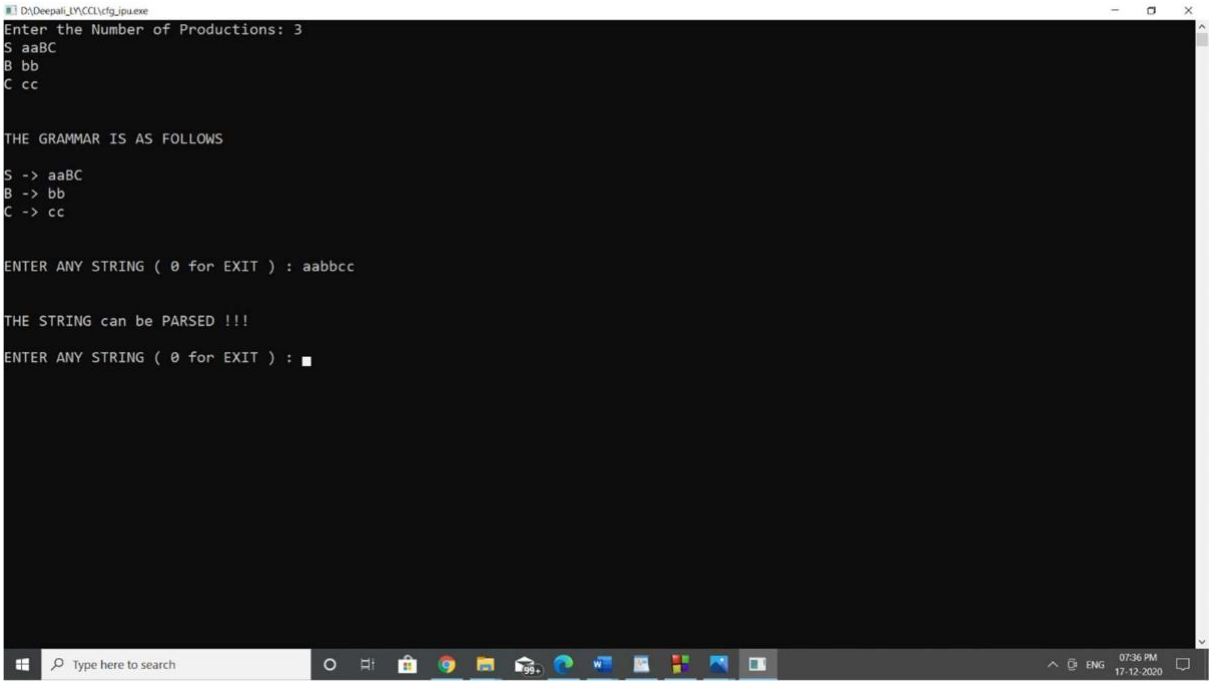
PROGRAM 3:

```
#include<stdio.h>
#include<string.h>
 int i,j,k,l,m,np,n=0,o,p,nv,z=0,t,x=0; char
str[10],temp[20],temp2[20],temp3[20];
 struct prod {     char lhs[10],rhs[10][10];
int n;
}pro[10];  void
findter()
{     for(k=0;k<n;k++)
   {        if(temp[i]==pro[k].lhs[0])
      {            for(t=0;t<pro[k].n;t++)
         {               for(l=0;l<20;l++)                   temp2[l]='\0';
for(l=i+1;l<strlen(temp);l++)                   temp2[l-i-1]=temp[l];
for(l=i;l<20;l++)                   temp[l]='\0';
for(l=0;l<strlen(pro[k].rhs[t]);l++)                   temp[i+l]=pro[k].rhs[t][l];
strcat(temp,temp2);                if(str[i]==temp[i])                   return;
            else if(str[i]!=temp[i] && temp[i]>=65 && temp[i]<=90)
               break;
         }            break;
      }     }     if(temp[i]>=65 && temp[i]<=90)
findter();
```

```
}  int main() {
for(i=0;i<10;i++)
pro[i].n=0;
    printf("Enter the Number of Productions: ");     scanf("%d",&np);
    while(n < np)     {         scanf("%s",pro[n].lhs);         if(n>0)         {             if(
strcmp(pro[n].lhs,pro[n-1].lhs) == 0 )
          {                pro[n].lhs[0]='\0';                scanf("%s",pro[n-1].rhs[pro[n-
1].n]);
                                    pro[n-1].n++;
             continue;
          }         }         scanf("%s",pro[n].rhs[pro[n].n]);
pro[n].n++;         n++;
   }
    printf("\n\nTHE GRAMMAR IS AS FOLLOWS\n\n");     for(i=0;i<n;i++)
for(j=0;j<pro[i].n;j++)                    printf("%s -> %s\n",pro[i].lhs,pro[i].rhs[j]);
    while(1)     {         for(l=0;l<10;l++)             str[0]=NULL;
printf("\n\nENTER ANY STRING ( 0 for EXIT ) : ");         scanf("%s",str);
if(str[0]=='0')            break;// exit(1);
       for(j=0;j<pro[0].n;j++)
      {            for(l=0;l<20;l++)                temp[l]=NULL;
strcpy(temp,pro[0].rhs[j]);
          m=0;             for(i=0;i<strlen(str);i++)
          {                if(str[i]==temp[i])
m++;
             else if(str[i]!=temp[i] && temp[i]>=65 && temp[i]<=90)                {
                                findter();
                if(str[i]==temp[i])                        m++;
             }
             else if( str[i]!=temp[i] && (temp[i]<65 || temp[i]>90) )                    break;
          }             if(m==strlen(str) && strlen(str)==strlen(temp))
          {                printf("\n\nTHE STRING can be PARSED !!!");                break;
          }         }         if(j==pro[0].n)             printf("\n\nTHE STRING can NOT be
PARSED !!!");
   }     return 0;
```

}

OUTPUT :


D:\Deepali_LY\CCL\cfg_jpu.exe
Enter the Number of Productions: 3
S aaBC
B bb
C cc
THE GRAMMAR IS AS FOLLOWS
S -> aaBC
B -> bb
C -> cc
ENTER ANY STRING (0 for EXIT) : aabbcc
THE STRING can be PARSED !!!
ENTER ANY STRING (0 for EXIT) :
Type here to search
ENG
07:36 PM
17-12-2020