CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Department of Computer Engineering

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Date of exam	:	18/11/2021			

Definition:

Implementation of Context Free Grammar.

Program:

```
#include<stdio.h>
#include<string.h>
#include<conio.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();
}

int main()
{
```

```
    FILE *f;
//    clrscr();

    for(i=0;i<10;i++)
        pro[i].n=0;

    f=fopen("syntax.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++;
    }
    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')
        printf("Exit");
//      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 !!!");
    }
    getch();
}
```

Content In “syntax.txt”:

S aBaA

S AB

A Bc

B c

Output Screen Shot:

```
E:\Practical>gcc External_Prac.c -o 18DCS007
External_Prac.c: In function 'main':
External_Prac.c:79:19: warning: assignment makes integer from pointer without a cast [enabled by default]
External_Prac.c:89:24: warning: assignment makes integer from pointer without a cast [enabled by default]

E:\Practical>18DCS007


THE GRAMMAR IS AS FOLLOWS

S -> aBaA
S -> AB
A -> Bc
B -> c


ENTER ANY STRING ( 0 for EXIT ) : ccccc


THE STRING can NOT be PARSED !!!

ENTER ANY STRING ( 0 for EXIT ) : caac


THE STRING can NOT be PARSED !!!

ENTER ANY STRING ( 0 for EXIT ) : acacc


THE STRING can be PARSED !!!
```

Conclusion:

Successfully completed Context Free Grammar Practical