RA2011031010046

EXPERIMENT : 4b **ELIMINATION OF AMBIGUITY USING LEFT FACTORING**

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AIM : To write a program in C/C++ to eliminate ambiguity using left factoring.

PROCEDURE:

1. Start the program.
2. Ask the user to enter the set of productions.
3. Check for common symbols in the given set of productions by comparing with:
   A -> αB1 | αB2
4. If found, replace the particular productions with:
   A -> αA
   A' -> B1 | B2 | ε
5. Display the output.
6. Exit.

PROGRAM:

```
#include <string.h>
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
int main()
{
   char ch, lhs[20][20], rhs[20][20][20], temp[20], temp1[20];
   int n, n1, count[20], x, y, i, j, k, c[20];
   printf("\nEnter the no. of nonterminals : ");
   scanf("%d", &n);
   n1 = n;
   for (i = 0; i < n; i++)
   {
      printf("\nNonterminal %d \nEnter the no. of productions : ", i + 1);
      scanf("%d", &c[i]);
      printf("\nEnter LHS : ");
      scanf("%s", lhs[i]);
      for (j = 0; j < c[i]; j++)
      {
         printf("%s->", lhs[i]);
         scanf("%s", rhs[i][j]);
      }
   }
   for (i = 0; i < n; i++)
   {
      count[i] = 1;
```

```
        while (memcmp(rhs[i][0], rhs[i][1], count[i]) == 0)
            count[i]++;
    }
    for (i = 0; i < n; i++)
    {
        count[i]--;
        if (count[i] > 0)
        {
            strcpy(lhs[n1], lhs[i]);
            strcat(lhs[i], "'");
            for (k = 0; k < count[i]; k++)
                temp1[k] = rhs[i][0][k];
            temp1[k++] = '\0';
            for (j = 0; j < c[i]; j++)
            {
                for (k = count[i], x = 0; k < strlen(rhs[i][j]); x++, k++)
                    temp[x] = rhs[i][j][k];
                temp[x++] = '\0';
                if (strlen(rhs[i][j]) == 1)
                    strcpy(rhs[n1][1], rhs[i][j]);
                strcpy(rhs[i][j], temp);
            }
            c[n1] = 2;
            strcpy(rhs[n1][0], temp1);
            strcat(rhs[n1][0], lhs[n1]);
            strcat(rhs[n1][0], "'");
            n1++;
        }
    }
    printf("\n\nThe resulting productions are : \n");
    for (i = 0; i < n1; i++)
    {
        if (i == 0)
            printf("\n %s -> %c|", lhs[i], (char)238);
        else
            printf("\n %s -> ", lhs[i]);
        for (j = 0; j < c[i]; j++)
        {
            printf(" %s ", rhs[i][j]);
            if ((j + 1) != c[i])
                printf("|");
        }
        printf("\b\b\b\n");
    }
    return 0;
}
```

INPUT:

Enter the no. of nonterminals : 2

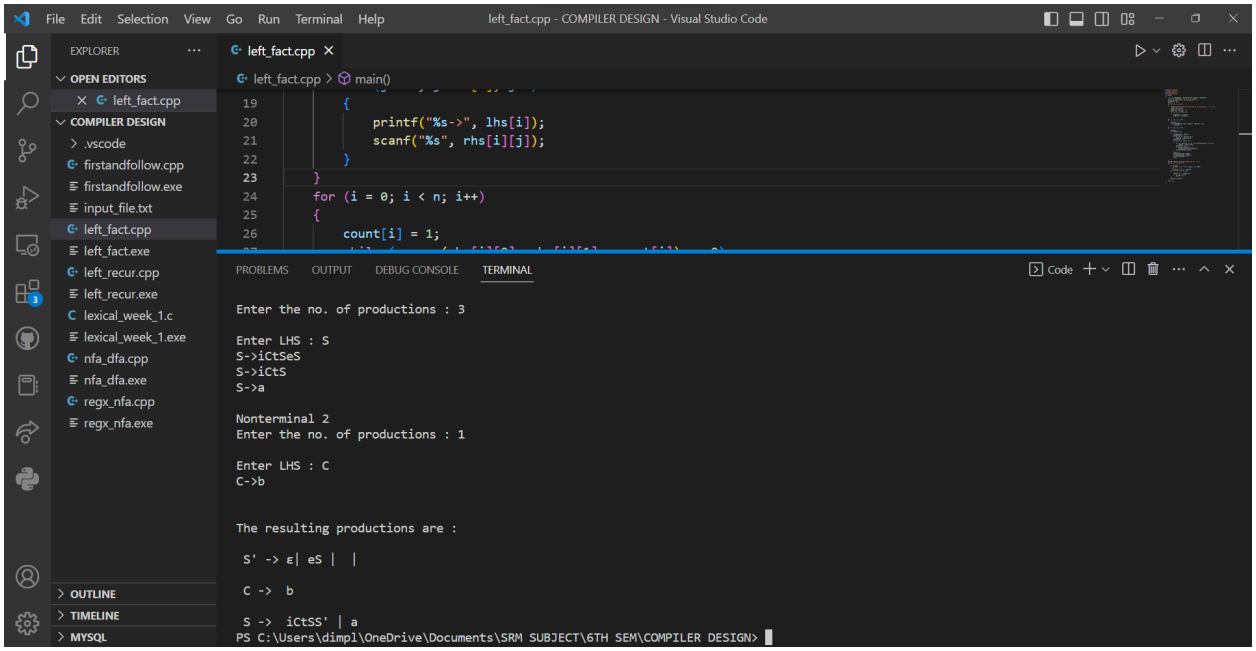
Nonterminal 1
Enter the no. of productions : 3

Enter LHS : S
S->iCtSeS
S->iCtS
S->a

Nonterminal 2
Enter the no. of productions : 1

Enter LHS : C
C->b

OUTPUT:



RESULT:

Thus, we have successfully implemented the concept of ambiguity elimination using left factoring.