Exp-6 Predictive Parsing Table

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Aim:

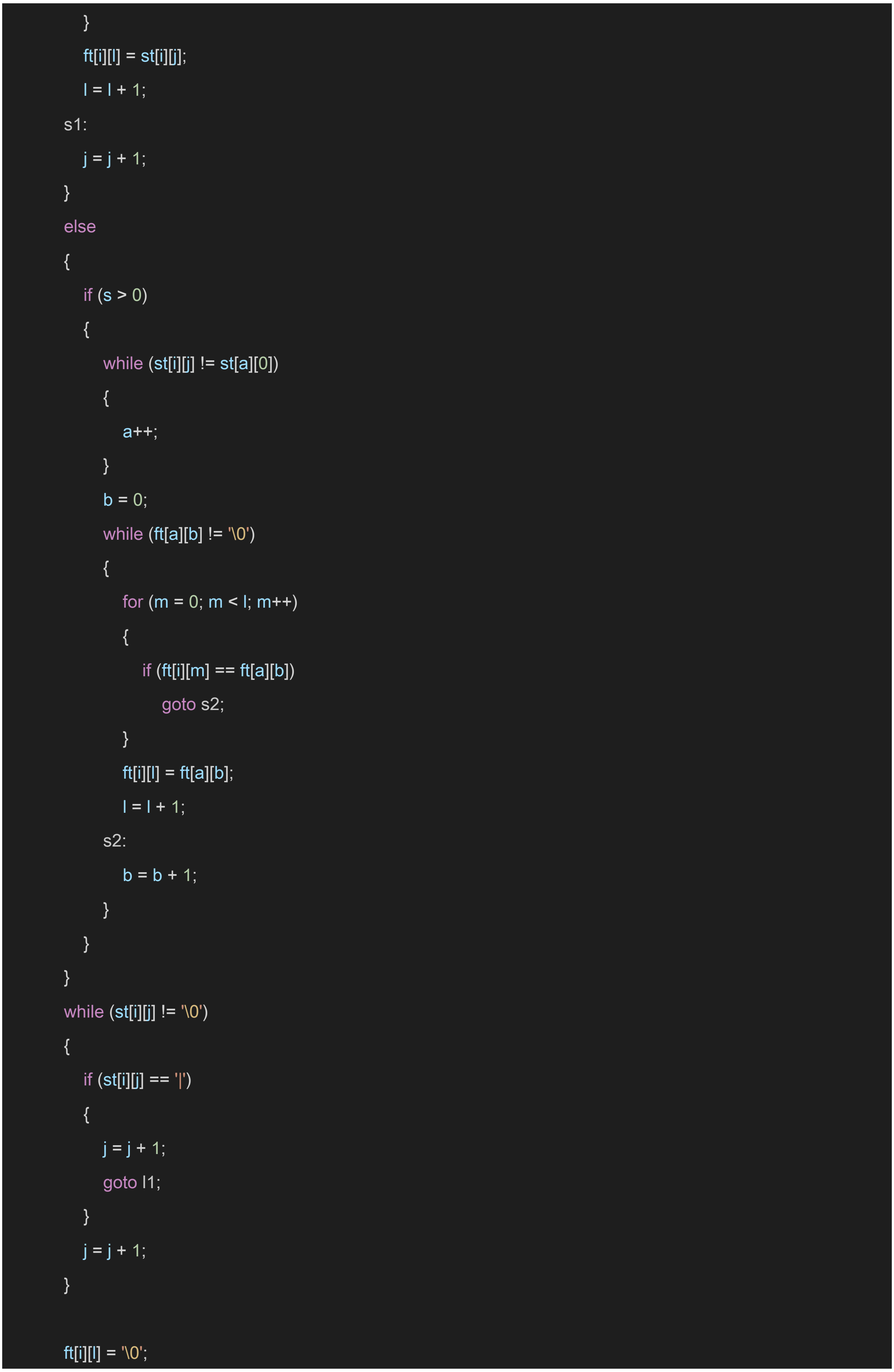
To write a program to perform a predictive parsing table.

Code:

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

int main()
{
    char fin[10][20], st[10][20], ft[20][20], fol[20][20];
    int a = 0, e, i, t, b, c, n, k, l = 0, j, s, m, p;

    printf("enter the no. of nonterminals\n");
    scanf("%d", &n);
    printf("enter the productions in a grammar\n");
    for (i = 0; i < n; i++)
        scanf("%s", st[i]);
    for (i = 0; i < n; i++)
        fol[i][0] = '\0';
    for (s = 0; s < n; s++)
    {
        for (i = 0; i < n; i++)
        {
            j = 3;
            l = 0;
            a = 0;
        l1:
            if (!((st[i][j] > 64) && (st[i][j] < 91)))
            {
                for (m = 0; m < l; m++)
                {
                    if (ft[i][m] == st[i][j])
                        goto s1;
```

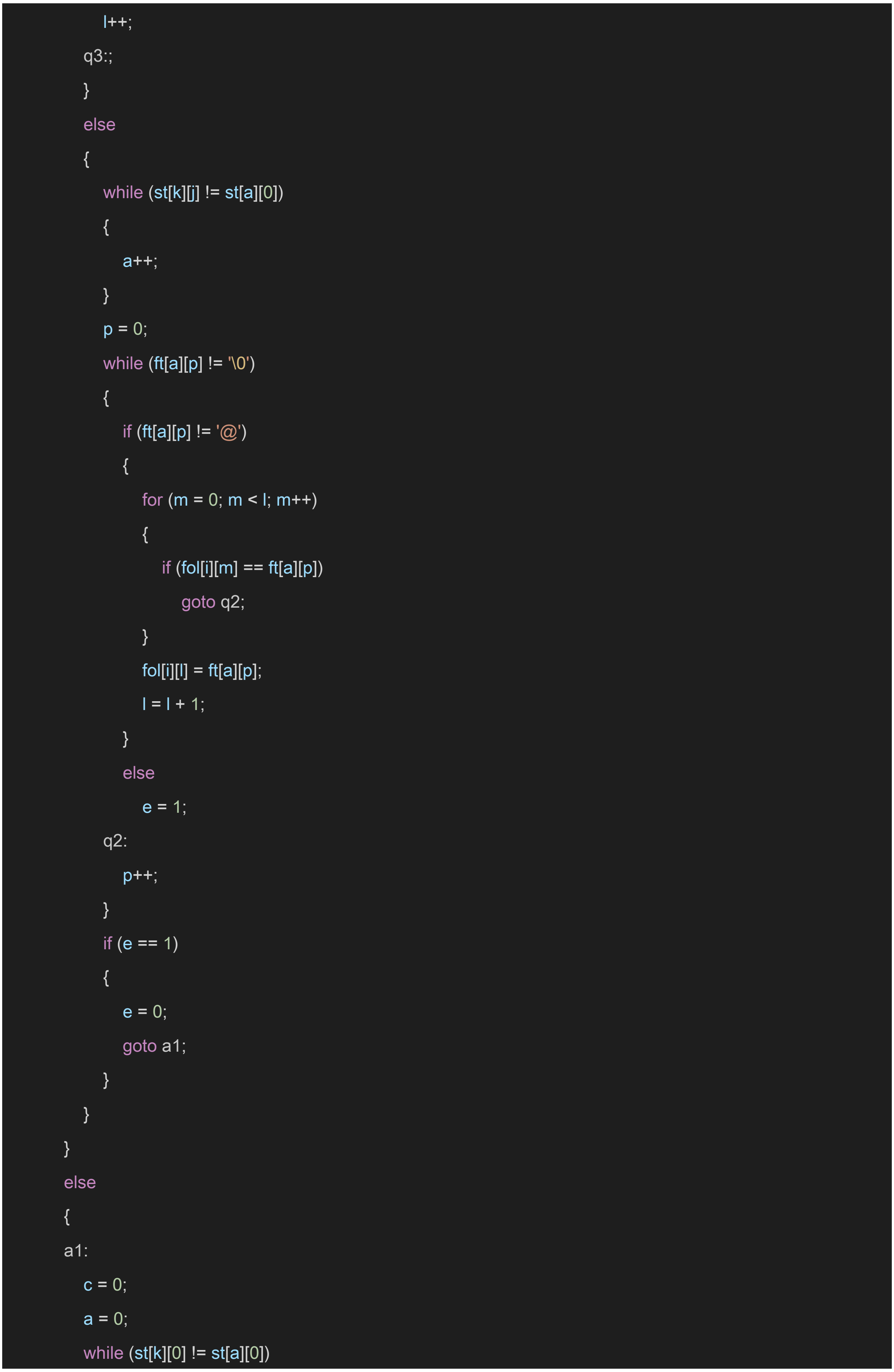


```
    }
    ft[i][l] = st[i][j];
    l = l + 1;
s1:
    j = j + 1;
}
else
{
    if (s > 0)
    {
        while (st[i][j] != st[a][0])
        {
            a++;
        }
        b = 0;
        while (ft[a][b] != '\0')
        {
            for (m = 0; m < l; m++)
            {
                if (ft[i][m] == ft[a][b])
                    goto s2;
            }
            ft[i][l] = ft[a][b];
            l = l + 1;
        s2:
            b = b + 1;
        }
    }
}
while (st[i][j] != '\0')
{
    if (st[i][j] == '|')
    {
        j = j + 1;
        goto l1;
    }
    j = j + 1;
}

ft[i][l] = '\0';
```

```
    }
}
printf("\n");
printf("first \n");
for (i = 0; i < n; i++)
    printf("FIRS[%c]=%s\n", st[i][0], ft[i]);
fol[0][0] = '$';
for (i = 0; i < n; i++)
{
    k = 0;
    j = 3;
    if (i == 0)
        l = 1;
    else
        l = 0;
k1:
    while ((st[i][0] != st[k][j]) && (k < n))
    {
        if (st[k][j] == '\0')
        {
            k++;
            j = 2;
        }
        j++;
    }

    j = j + 1;
    if (st[i][0] == st[k][j - 1])
    {
        if ((st[k][j] != '|') && (st[k][j] != '\0'))
        {
            a = 0;
            if (!((st[k][j] > 64) && (st[k][j] < 91)))
            {
                for (m = 0; m < l; m++)
                {
                    if (fol[i][m] == st[k][j])
                        goto q3;
                }
                fol[i][l] = st[k][j];
```

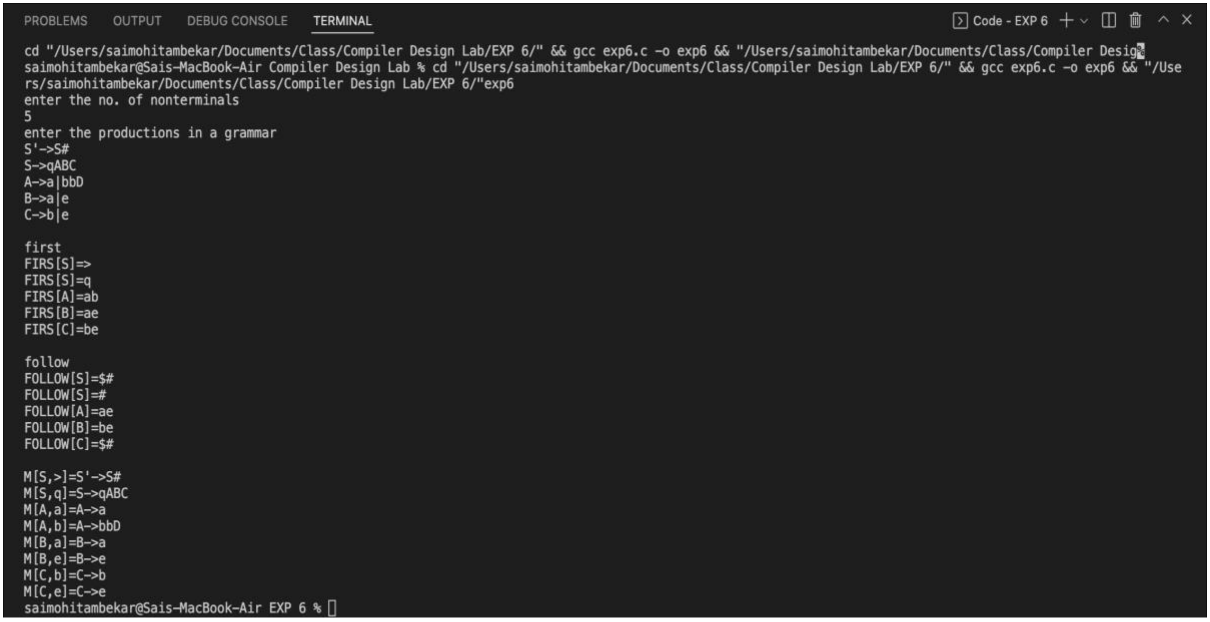


```
        l++;
    q3:;
    }
    else
    {
        while (st[k][j] != st[a][0])
        {
            a++;
        }
        p = 0;
        while (ft[a][p] != '\0')
        {
            if (ft[a][p] != '@')
            {
                for (m = 0; m < l; m++)
                {
                    if (fol[i][m] == ft[a][p])
                        goto q2;
                }
                fol[i][l] = ft[a][p];
                l = l + 1;
            }
            else
                e = 1;
        q2:
            p++;
        }
        if (e == 1)
        {
            e = 0;
            goto a1;
        }
    }
}
else
{
a1:
    c = 0;
    a = 0;
    while (st[k][0] != st[a][0])
```

```
            {
                a++;
            }
            while ((fol[a][c] != '\0') && (st[a][0] != st[i][0]))
            {
                for (m = 0; m < l; m++)
                {
                    if (fol[i][m] == fol[a][c])
                        goto q1;
                }
                fol[i][l] = fol[a][c];
                l++;
            q1:
                c++;
            }
        }
        goto k1;
    }
    fol[i][l] = '\0';
}
printf("\n");
printf("follow \n");
for (i = 0; i < n; i++)
    printf("FOLLOW[%c]=%s\n", st[i][0], fol[i]);
printf("\n");
s = 0;
for (i = 0; i < n; i++)
{
    j = 3;
    while (st[i][j] != '\0')
    {
        if ((st[i][j - 1] == '|') || (j == 3))
        {
            for (p = 0; p <= 2; p++)
            {
                fin[s][p] = st[i][p];
            }
            t = j;
            for (p = 3; ((st[i][j] != '|') && (st[i][j] != '\0')); p++)
            {
                fin[s][p] = st[i][j];
                j++;
            }
            fin[s][p] = '\0';
            if (st[i][k] == '@')
            {
                b = 0;
                a = 0;
                while (st[a][0] != st[i][0])
                {
                    a++;
                }
                while (fol[a][b] != '\0')
                {
                    printf("M[%c,%c]=%s\n", st[i][0], fol[a][b], fin[s]);
                    b++;
                }
            }
            else if (!((st[i][t] > 64) && (st[i][t] < 91)))
                printf("M[%c,%c]=%s\n", st[i][0], st[i][t], fin[s]);
            else
            {
                b = 0;
                a = 0;
                while (st[a][0] != st[i][3])
                {
                    a++;
                }
                while (ft[a][b] != '\0')
                {
                    printf("M[%c,%c]=%s\n", st[i][0], ft[a][b], fin[s]);
                    b++;
                }
            }
            s++;
        }
        if (st[i][j] == '|')
            j++;
    }
}
```

```
}
```

Output:



```
cd "/Users/saimohitambekar/Documents/Class/Compiler Design Lab/EXP 6/" && gcc exp6.c -o exp6 && "/Users/saimohitambekar/Documents/Class/Compiler Desig
saimohitambekar@Sais-MacBook-Air Compiler Design Lab % cd "/Users/saimohitambekar/Documents/Class/Compiler Design Lab/EXP 6/" && gcc exp6.c -o exp6 && "/Use
rs/saimohitambekar/Documents/Class/Compiler Design Lab/EXP 6/"exp6
enter the no. of nonterminals
5
enter the productions in a grammar
S'->S#
S->qABC
A->a|bbD
B->a|e
C->b|e

first
FIRS[S]=>
FIRS[S]=q
FIRS[A]=ab
FIRS[B]=ae
FIRS[C]=be

follow
FOLLOW[S]=$#
FOLLOW[S]=#
FOLLOW[A]=ae
FOLLOW[B]=be
FOLLOW[C]=$#

M[S,>]=S'->S#
M[S,q]=S->qABC
M[A,a]=A->a
M[A,b]=A->bbD
M[B,a]=B->a
M[B,e]=B->e
M[C,b]=C->b
M[C,e]=C->e
saimohitambekar@Sais-MacBook-Air EXP 6 % 
```

Result:

The predictive parsing table program was successfully compiled and executed.