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#include<stdio.h>
#include<math.h>
#include<string.h>
#include<ctype.h>
#include<stdlib.h>

int n, m = 0, p, i = 0, j = 0;
char a[10][10], f[10];
void follow(char c);
void first(char c);
int main() {
    int i, z;
    char c, ch;
    printf("Enter the no of productions : \n");
    scanf("%d", &n);
    printf("Enter the productions:\n");
    for (i = 0; i < n; i++)
        scanf("%s%c", a[i], &ch);
    do {
        m = 0;
        printf("Enter a variable whose fisrt & follow is to be found:");
        scanf("%c", &c);
        first(c);
        printf("First(%c)={", c);
        for (i = 0; i < m; i++) printf("%c", f[i]);
        printf("}\n");
        strcpy(f, " ");
        m = 0;
        follow(c);
        printf("Follow(%c)={", c);
        for (i = 0; i < m; i++) printf("%c", f[i]);
        printf("}\n");
        printf("Want to continue or not(1/0) ? ");
        scanf("%d%c", &z, &ch);
    } while (z == 1);
    return (0);
}

void first(char c) {
    int k;
    if (!isupper(c)) f[m++] = c;
    for (k = 0; k < n; k++) {
        if (a[k][0] == c) {
            if (a[k][2] == '$')
                follow(a[k][0]);
            else if (islower(a[k][2]))
                f[m++] = a[k][2];
            else
                first(a[k][2]);
        }
    }
}

void follow(char c) {
    if (a[0][0] == c)
        f[m++] = '$';
    for (i = 0; i < n; i++) {
        for (j = 2; j < strlen(a[i]); j++) {
            if (a[i][j] == c) {

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if (a[i][j + 1] != '\0')  
    first(a[i][j + 1]);  
if (a[i][j + 1] == '\0' && c != a[i][0])  
    follow(a[i][0]);
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}
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}
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}
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}
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