#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#define MAX\_PROD 10

#define MAX\_LEN 10

int n = 4; // Number of productions

char productions[MAX\_PROD][MAX\_LEN];

char nonTerminals[MAX\_PROD];

char first[MAX\_PROD][MAX\_LEN];

char follow[MAX\_PROD][MAX\_LEN];

void findFirst(int i, int j) {

if (productions[i][j] == '\0') {

first[i][strlen(first[i])] = '\0';

return;

}

int k;

int added = 0;

for (k = 0; k < n; k++) {

if (productions[k][0] == productions[i][j]) {

if (productions[k][2] == 'e') {

added = 1;

} else {

findFirst(k, 2);

}

}

}

if (!added) {

first[i][strlen(first[i])] = productions[i][j];

}

}

void computeFirst() {

int i, j;

for (i = 0; i < n; i++) {

first[i][0] = '\0';

}

for (i = 0; i < n; i++) {

findFirst(i, 2);

}

}

int main() {

strcpy(productions[0], "S->AaB");

strcpy(productions[1], "A->b");

strcpy(productions[2], "A->e");

strcpy(productions[3], "B->c");

computeFirst();

printf("First Sets:\n");

for (int i = 0; i < n; i++) {

printf("First(%c): {%s}\n", productions[i][0], first[i]);

}

return 0;

}

