#include<stdio.h>

void tuple(int sp[50][50], int t[50][3], int r, int c){

int i, j;

t[0][0] = r;

t[0][1] = c;

int count = 0, l = 1;

for (i = 0; i < r; i++)

{

for(j = 0; j < c; j++)

{

if (sp[i][j] != 0)

{

t[l][0] = i;

t[l][1] = j;

t[l][2] = sp[i][j];

l++;

count++;

}

}

}

t[0][2] = count;

}

void multi(int t1[50][3], int t2[50][3]){

int res[50][3], t3[50][3], i, j = 1, k, l=1, m=1, n = 1;

// transpose(t2, t3);

if (t1[0][1] != t2[0][0])

{

printf("Cant multiply");

return;

}

res[0][0] = t1[0][0];

res[0][1] = t2[0][1];

/\*multiply\*/

for ( i = 0; i < t1[0][1]; i++)

{

for (j = 1; j <= t1[0][2]; j++)

{

for (k = 1; k <= t2[0][2]; k++)

{

if (t1[j][1] == i && t2[k][0] == i)

{

res[l][0] = t1[j][0];

res[l][1] = t2[k][1];

res[l][2] = t1[j][2]\*t2[k][2];

l++;

}

}

}

}

res[0][2] = l-1;

t3[0][0] = res[0][0];

t3[0][1] = res[0][1];

t3[0][2] = res[0][2];

/\*Sorting\*/

for (i = 0; i < res[0][0]; i++)

{

for (k = 0; k < res[0][1]; k++)

{

for (j = 1; j <= res[0][2]; j++)

{

if (res[j][0] == i)

{

if (res[j][1] == k)

{

t3[m][0] = res[j][0];

t3[m][1] = res[j][1];

t3[m][2] = res[j][2];

m++;

}

}

}

}

}

/\*adding like terms\*/

i = 1;

while(i <= t3[0][2])

{

if (t3[i][0] == t3[i+1][0] && t3[i][1] == t3[i+1][1])

{

t3[i][2] += t3[i+1][2];

for (j = i+1; j <= t3[0][2]; j++)

{

t3[j][0] = t3[j+1][0];

t3[j][1] = t3[j+1][1];

t3[j][2] = t3[j+1][2];

printf("%i\n", t3[0][2]);

}

i = 1;

t3[0][2]--;

}

else

i++;

}

printf("Resultant\n");

for ( i = 0; i <= t3[0][2]; i++)

{

for (j = 0; j < 3; j++)

{

printf("%i ", t3[i][j]);

}

printf("\n");

}

}

main(){

int sp1[50][50], sp2[50][50], t1[50][3], t2[50][3], tr1[50][3], r1, c1, r2, c2, i, j;

printf("Enter the number of rows and column of 1\n");

scanf("%i %i", &r1, &c1);

printf("Enter the elements\n");

for ( i = 0; i < r1; i++)

{

for (j = 0; j < c1; j++)

{

scanf("%i", &sp1[i][j]);

}

}

printf("Enter the number of rows and column of 2\n");

scanf("%i %i", &r2, &c2);

printf("Enter the elements\n");

for ( i = 0; i < r2; i++)

{

for (j = 0; j < c2; j++)

{

scanf("%i", &sp2[i][j]);

}

}

tuple(sp1, t1, r1, c1);

tuple(sp2, t2, r2, c2);

printf("first\n");

for ( i = 0; i <= t1[0][2]; i++)

{

for (j = 0; j < 3; j++)

{

printf("%i ", t1[i][j]);

}

printf("\n");

}

printf("second\n");

for ( i = 0; i <= t2[0][2]; i++)

{

for (j = 0; j < 3; j++)

{

printf("%i ", t2[i][j]);

}

printf("\n");

}

// transpose(t1, tr1);

multi(t1, t2);

}