

PAT_A1009. Product of Polynomials (25)

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Problem

This time, you are supposed to find $A*B$ where A and B are two polynomials.

Input Specification:

Each input file contains one test case. Each case occupies 2 lines, and each line contains the information of a polynomial: $K\ N_1\ a_{N1}\ N_2\ a_{N2}\ \dots\ N_K\ a_{NK}$, where K is the number of nonzero terms in the polynomial, N_i and a_{Ni} ($i=1, 2, \dots, K$) are the exponents and coefficients, respectively. It is given that $1 \leq K \leq 10$, $0 \leq N_K < \dots < N_2 < N_1 \leq 1000$.

Output Specification:

For each test case you should output the product of A and B in one line, with the same format as the input. Notice that there must be NO extra space at the end of each line. Please be accurate up to 1 decimal place.

Sample Input

```
2 1 2.4 0 3.2
2 2 1.5 1 0.5
```

Sample Output

```
3 3 3.6 2 6.0 1 1.6
```

Code

```
#include <cmath>
#include <cstdio>
#include <algorithm>

using std::fill;
int main(){
    const int maxn=2010;
    double ex1[maxn];
    fill(ex1,ex1+maxn,0);
    int num;
    scanf("%d",&num);

    int ex;
```

```

double co;
for(int i=0;i<num;++i){
    scanf("%d %lf",&ex,&co);
    ex1[ex]=co;
}

double ex2[maxn];
fill(ex2,ex2+maxn,0);

scanf("%d",&num);
for(int i=0;i<num;++i){
    scanf("%d %lf",&ex,&co);
    ex2[ex]=co;
}
double ex3[maxn];
fill(ex3,ex3+maxn,0);
for(int i=0;i<maxn;++i){
    for(int j=0;j<maxn;++j){
        if(i+j<maxn){
            ex3[i+j]+=ex1[i]*ex2[j];
        }
    }
}
int count=0;
for(int i=0;i<maxn;++i){
    if(ex3[i]!=0){
        ++count;
    }
}
printf("%d ",count);
int temp=0;
for(int i=maxn-1;i>=0;--i){
    if(ex3[i]!=0){
        ++temp;
        if(temp<count){
            printf("%d %.11f ",i,ex3[i]);
        }
        else{
            printf("%d %.11f\n",i,ex3[i]);
            break;
        }
    }
}
}
}

```

```

#include <iostream>
#include <vector>
#include <string>
#include <cstdio>

using std::cin;

using std::cout;

```

```

using std::endl;
using std::vector;
const int maxn=2010;
struct ploy{
    int exp;
    double cof;
    ploy():exp(0),cof(0.0){}
};

int main(){
    vector<ploy> p(maxn);
    vector<double> ans(maxn);
    int exp;
    double cof;
    int num;
    cin>>num;
    for(int i=0;i<num;++i){
        scanf("%d %lf",&p[i].exp,&p[i].cof);
    }
    int counter;
    scanf("%d",&counter);
    for(int i=0;i<counter;++i){
        scanf("%d %lf",&exp,&cof);
        for(int j=0;j<num;++j){
            ans[exp+p[j].exp]+=cof*p[j].cof;
        }
    }
    counter=0;
    for(int i=0;i<maxn;++i){
        if(ans[i]!=0.0){
            ++counter;
        }
    }
    cout<<counter<<" ";
    for(int i=maxn;i>=0;--i){
        if(ans[i]!=0.0){
            printf("%d %.11f",i,ans[i]);
            --counter;
            if(counter>0){
                printf(" ");
            }
            else{
                printf("\n");
            }
        }
    }
    return 0;
}

```