#include<iostream>

#include <string>

using namespace std;

void merge(int n, int a1[], int a2[], int mergedArray[]) {

int i = 0;

int j = 0;

int k = 0;

while (i < n && j < n) {

if (a1[i] <= a2[j]) {

mergedArray[k++] = a1[i++];

}

else {

mergedArray[k++] = a2[j++];

}

}

while (i < n) mergedArray[k++] = a1[i++];

while (j < n) mergedArray[k++] = a2[j++];

}

int max(int x, int y){

if (x > y)

return x;

else return y;

}

int main(){

int ss[20][2];

int s1, s2;

int n = 0;

int cs;

int x[20];

int y[20];

int x2[20];

cout << "Input the case: ";

cin >> cs;

if (cs == 1)

n = 10;

else if (cs == 2)

n = 20;

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

cout << "x " << i + 1 << ":";

cin >> x[i];

cout << "revenue " << i + 1 << ":";

cin >> y[i];

}

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

x2[i] = x[i] - 5;

}

int chk2[40];

int chk[40];

int z[40];

int e[21];

int k = 0;

int l = 0;

int ct = 0;

merge(n, x, x2, z);

for (int i = 0; i < n\*2; i++){

if (z[i] == x2[k]){

k++;

}

else if (z[i] == x[l]){

l++;

}

chk[i] = l;

chk2[i] = k;

}

cout << "\n";

for (int i = 0; i < 2\*n; i++){

cout << chk[i] <<" ";

}

cout << "\n";

for (int i = 0; i < 2\*n; i++){

cout << chk2[i]<< " ";

}

cout << "\n";

for (int i = 0; i < 2\*n; i++){

if (ct +1 == chk2[i]){

e[ct] = chk[i];

ct++;

}

}

cout << "\n";

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

cout << e[i] << " ";

}

int M[20+1];

M[0] = 0;

M[1] = y[0];

ss[0][0] = 0;

ss[1][0] = 1;

for (int j = 2; j <= n; j++){

M[j] = max((y[j-1] + M[e[j-1]]), M[j - 1]);

if ((y[j - 1] + M[e[j - 1]]) > M[j - 1]){

ss[j][0] = j;

ss[j][1] = e[j - 1];

}

else {

ss[j][0] = ss[j - 1][0];

ss[j][1] = ss[j - 1][1];

}

}

cout << "\n";

cout <<"Max is: "<< M[n-1] << " \nPlace billboard at: x" << ss[n-1][0] << " x" << ss[n-1][1] << "\n";

system("pause");

}