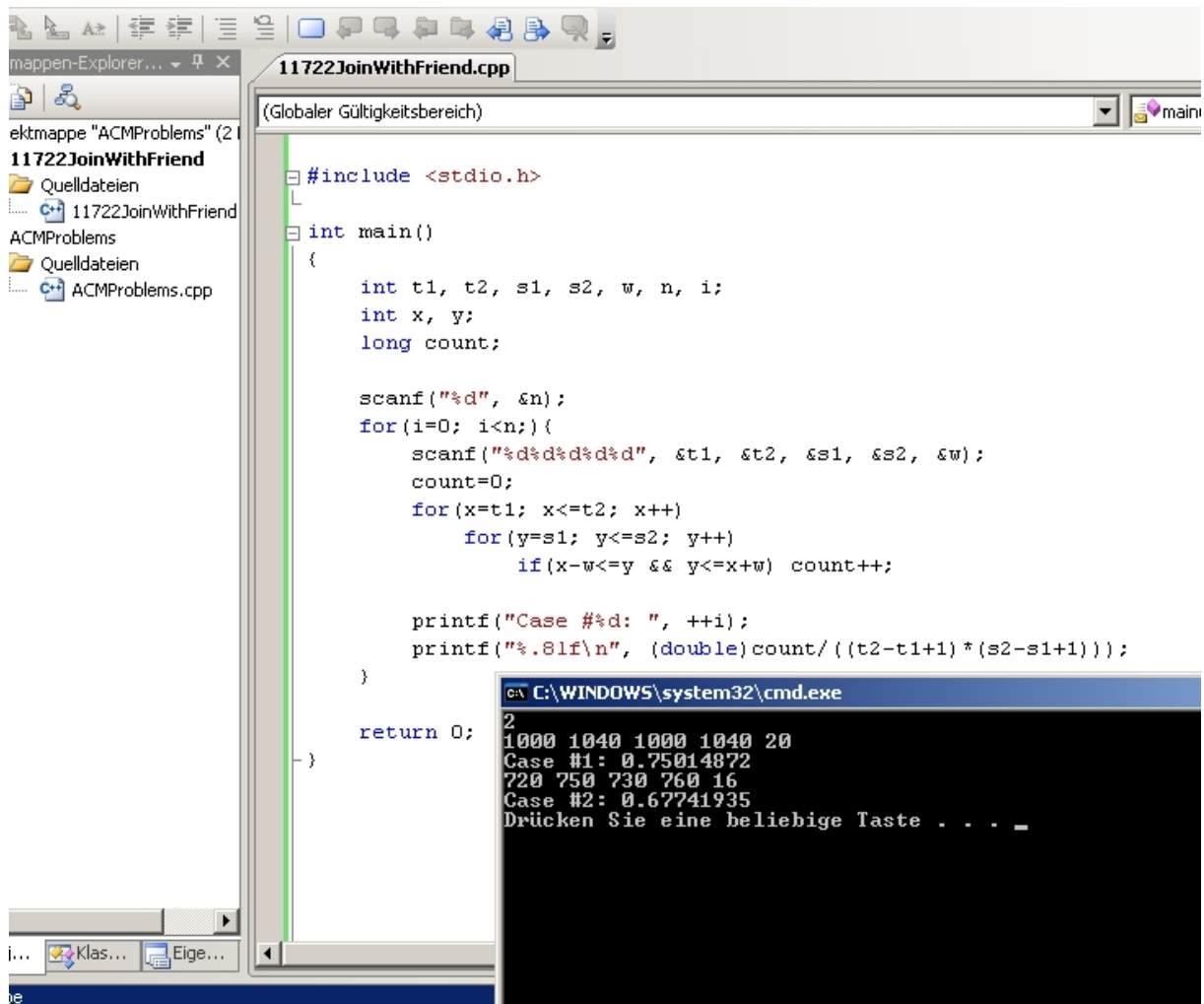


1. Variante - Diskret

Schritt 1



```
#include <stdio.h>

int main()
{
    int t1, t2, s1, s2, w, n, i;
    int x, y;
    long count;

    scanf("%d", &n);
    for(i=0; i<n;){
        scanf("%d%d%d%d%d", &t1, &t2, &s1, &s2, &w);
        count=0;
        for(x=t1; x<=t2; x++)
            for(y=s1; y<=s2; y++)
                if(x-w<=y && y<=x+w) count++;

        printf("Case #d: ", ++i);
        printf("%.81f\n", (double)count/((t2-t1+1)*(s2-s1+1)));
    }

    return 0;
}
```

```
C:\WINDOWS\system32\cmd.exe
2
1000 1040 1000 1040 20
Case #1: 0.75014872
720 750 730 760 16
Case #2: 0.67741935
Drücken Sie eine beliebige Taste . . . _
```

Schritt 0.5

The image shows a Visual Studio IDE window titled "11722JoinWithFriend.cpp". The code in the editor is as follows:

```
(Globaler Gültigkeitsbereich)
#include <stdio.h>

int main()
{
    int t1, t2, s1, s2, w, n, i;
    double x, y;
    long count;

    scanf("%d", &n);
    for(i=0; i<n;){
        scanf("%d%d%d%d", &t1, &t2, &s1, &s2, &w);
        count=0;
        for(x=t1; x<=t2; x+=.5)
            for(y=s1; y<=s2; y+=.5)
                if(x-w<=y && y<=x+w) count++;

        printf("Case #d: ", ++i);
        printf("%.8lf\n", (double) count / ((1+2*(t2-t1)) * (1+2*(s2-s1))));
    }

    return 0;
}
```

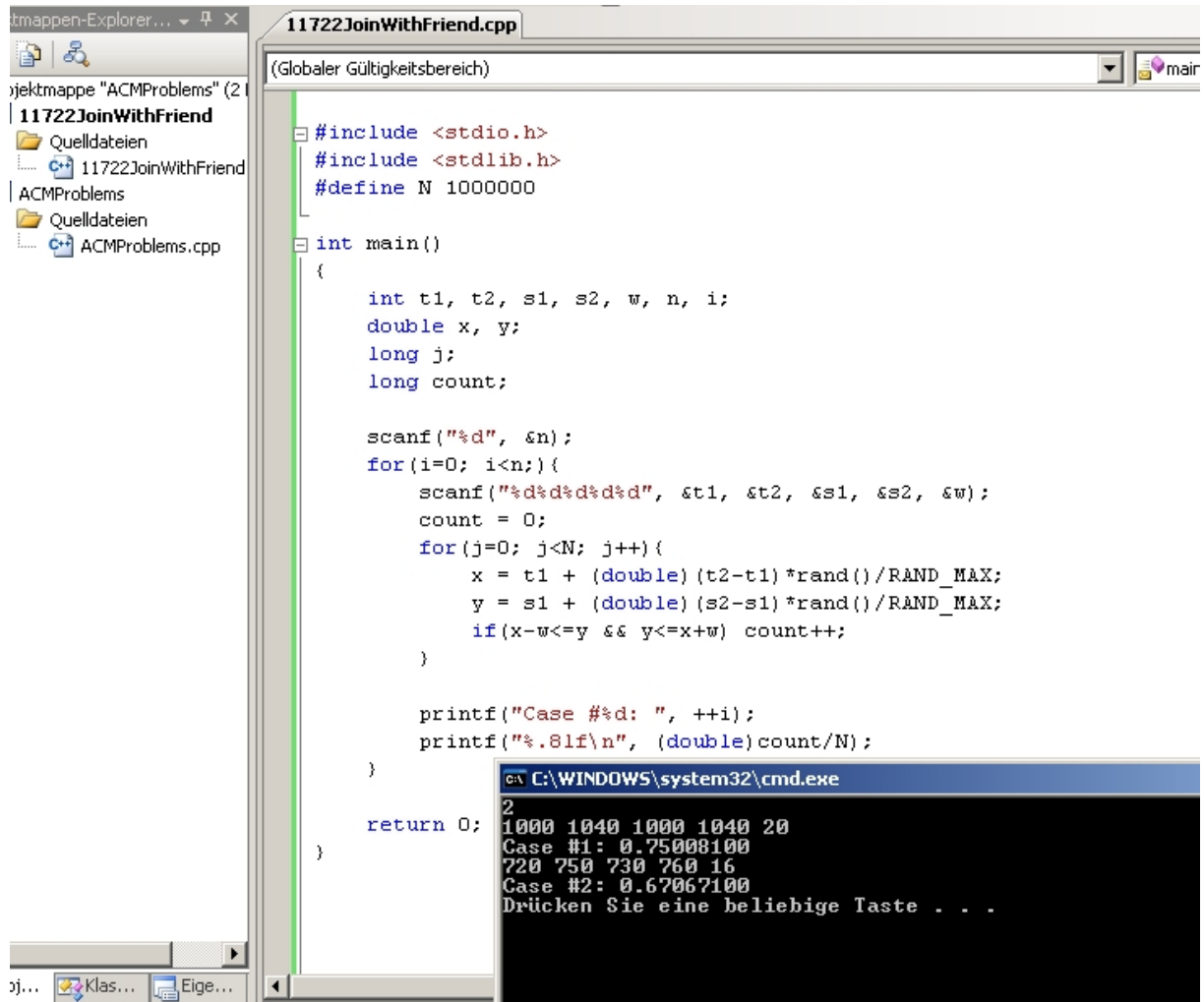
Below the code editor, a command prompt window is open, showing the execution of the program. The output is:

```
C:\WINDOWS\system32\cmd.exe
2
1000 1040 1000 1040 20
Case #1: 0.75003810
720 750 730 760 16
Case #2: 0.67428111
Drücken Sie eine beliebige Taste . . .
```

2. Variante – Monte-Carlo

Siehe: <http://de.wikipedia.org/wiki/Monte-Carlo-Simulation>

Mit $N=10E6$:



The screenshot shows a C++ IDE with a project named "ACMProblems". The file "11722JoinWithFriend.cpp" is open, displaying the following code:

```
#include <stdio.h>
#include <stdlib.h>
#define N 1000000

int main()
{
    int t1, t2, s1, s2, w, n, i;
    double x, y;
    long j;
    long count;

    scanf("%d", &n);
    for(i=0; i<n;){
        scanf("%d%d%d%d", &t1, &t2, &s1, &s2, &w);
        count = 0;
        for(j=0; j<N; j++){
            x = t1 + (double) (t2-t1) *rand()/RAND_MAX;
            y = s1 + (double) (s2-s1) *rand()/RAND_MAX;
            if(x-w<=y && y<=x+w) count++;
        }

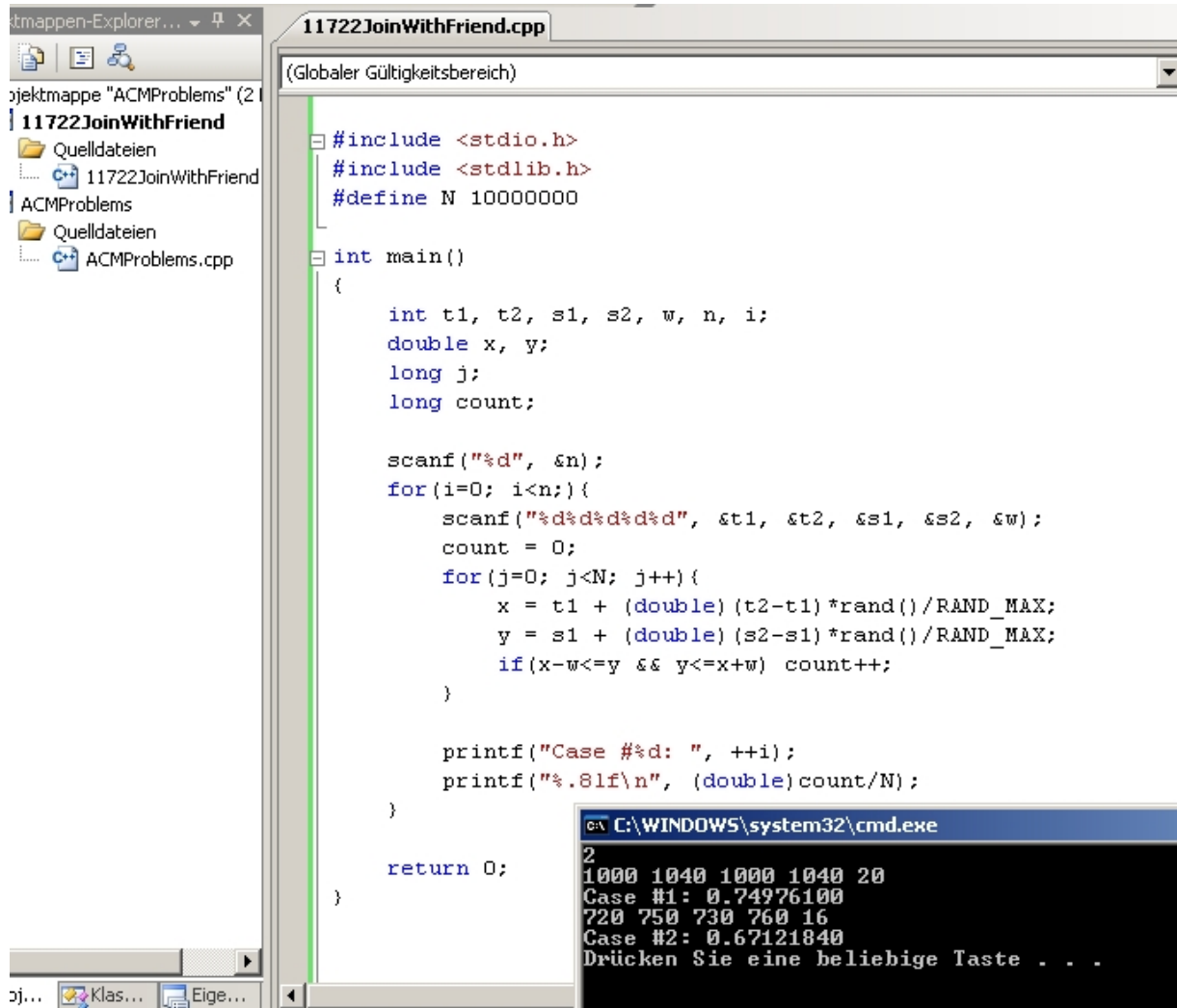
        printf("Case #%d: ", ++i);
        printf("%.8lf\n", (double)count/N);
    }

    return 0;
}
```

The output window shows the following results:

```
C:\WINDOWS\system32\cmd.exe
2
1000 1040 1000 1040 20
Case #1: 0.75008100
720 750 730 760 16
Case #2: 0.67067100
Drücken Sie eine beliebige Taste . . .
```

Mit $N=10E7$:



```
11722JoinWithFriend.cpp
(Globaler Gültigkeitsbereich)
#include <stdio.h>
#include <stdlib.h>
#define N 10000000

int main()
{
    int t1, t2, s1, s2, w, n, i;
    double x, y;
    long j;
    long count;

    scanf("%d", &n);
    for(i=0; i<n;){
        scanf("%d%d%d%d", &t1, &t2, &s1, &s2, &w);
        count = 0;
        for(j=0; j<N; j++){
            x = t1 + (double)(t2-t1)*rand()/RAND_MAX;
            y = s1 + (double)(s2-s1)*rand()/RAND_MAX;
            if(x-w<=y && y<=x+w) count++;
        }

        printf("Case #d: ", ++i);
        printf("%.8lf\n", (double)count/N);
    }

    return 0;
}
```

```
C:\WINDOWS\system32\cmd.exe
2
1000 1040 1000 1040 20
Case #1: 0.74976100
720 750 730 760 16
Case #2: 0.67121840
Drücken Sie eine beliebige Taste . . .
```