## ProblemA
**(Programfilename:A.CPPorA.PAS)**

# TrooperofBam

ThereisanancientstoryaboutatrooperSalmaninthecityofBam,whokilledagroupofthievesbyhisintelligent plan.Thescenariowasasfollows:Whenhearrivedtothecityhefoundthate          achthiefguardsastreetbywalkingalong apartofthatstreet,betweentwocrossroads.SalmanalsofoundthatallstreetsofBamareeitherverticalorhorizontal andthewalkingspeedofallthievesisonekilometerperhour.Firstforfindingthieves          hewalkedrandomlyalongsome streets,andinthestartingminuteofeachhour,hewrotedownthetimeandpositionofthethievesthathecouldsee.We knowthatthelengthofeachpartofastreetbetweentwoconsecutivecrossroadswasonekilometer,so          inthebeginning ofanhour,eachthiefwasinacrossroadandwouldbeseenbySalman,ifSalmanhadthesame          *xory*  coordinateas thief(i.e.Salmanandthiefareinthesamestreet).RememberthatatthebeginningofeachhourSalmanwasina crossroad too.

Salmanknewthatatacertaintimeallthieveswouldstoptheirguarding.Byhavingalltheseinformationhedecidedto selecttheshortestpathalongwhichhecouldseeallthieves          *surely*(whentheystoptheirguarding),andshootthemin thesmalles tperiod(Salmancouldshootathiefwheneverhecouldseehim).NotethatSalmanhadseeneachthiefat leatonce.

SupposethatyouknowtheinformationthatSalmangatheredduringhisrandomwalkandyouwanttohelphimfinding thesmallestpaththathe   willabsolutelyseeallthievesalongit.

### Input (filename:A.IN)

Theinputfileconsistsofseveraltestcases.Inthefirstlineofeachtestcasethereare6numbers          *n,p,s,x,y,o*   which arethenumberofthieves,thelengthoftheSalman'sfirstpat          h(inhour),thestoptimeinwhichallthieveswillstop, numberofverticalandhorizontalstreetsandfinallythenumberofobservationsthatSalmanhasdoneduringhisfirst path *(n<70,p<100,s<35000,x,y<100)*          .Afterthisline,thereare     *p*li neseachconsistingoftwonumbers.Theline number *l*ofthis *p*linesshowsthecoordinates     *(x,y)* ofSalmanatthestartingminuteofhour          *l*.Afterthissetoflines, thereare *o*lineseachconsistingof4numbers     *(t,tm,tx,ty)*  whichmeansthatSalmanh   asseenthief *t*ontime *tm* atthe point *(tx,ty)* .Thetestcasestartingwith6zerosisthefinaltestcaseandhasnooutput.

### Output (filename:A.OUT)

Foreachtestcase,printthelengthoftheshortestpathinkilometerinaseparateline.

### SampleInput

```
1 3 4 3 3 1
1 3
1 2
1 1
1 1 2 3
0 0 0 0 0 0
```

### SampleOutput

```
2
```