

Assignment 3

Adjustment Computations

March 1, 2017

Notes About the assignment

Generally your assignments would consist of two sections. You have practice problems that you need to solve by your hands—that will help you understand the materials even better. You also have programming problems, where you need to build a program that solves specific problem. Programming assignments are very important, in practice you often end up having observations that cannot be solved by hands.

Please, only submit your work! Do not cheat! I've developed a very buggy algorithm to compare your works.

Last note, you need to send me your submission via (gradescope, preferably, or to my email. I will not accept *any* handwritten submissions.)

1 General Problems

Problem 1. Eight blocks of a main street are to be reconstructed. The existing street consists of short segments as tabulated in the traverse survey data below. Assuming coordinates of $X = 1000.0$, and $Y = 1000.0$ and the azimuth of AB is 90° .

Compute.

1. Develop a program to solve this problem. I will not accept

<i>Course</i>	<i>Length[FT]</i>	<i>Station</i>	<i>Angle to right</i>
AB	735.7	B	$180^\circ 17'$
BC	464.8	C	$179^\circ 51'$
CD	503.1	D	$179^\circ 28'$
DE	820.0	E	$180^\circ 33'$
EF	917.3	F	$179^\circ 10'$
FG	329.8	G	$179^\circ 59'$
GH	287.4	H	$179^\circ 59'$
HI	345.9		

2. define a new straight alignment for a reconstructed street passing through this area.
3. Compute the slope and the azimuth of the line.
4. Plot the old alignment, and the updated one.

Problem 2. Develop an a program to compute the residuals.

```
function residuals = compute_residuals(A, X, L)
% This function computes the residual of a least squares adjutment.

your code goes here...
end
```

2 Extra problems

Write a GUI program to solve some adjustment problems. Your task is to write a graphical user interface that can solves some adjustment problem. If you need any help just ask me.

3 Submission

For your submission, would you please upload your work on this website <https://www.gradescope.com>. You need to use **9VYXEM** for the course code.