521 M7410 –Adjustment and Analysis of Spatial Information

Fall Semester 2015

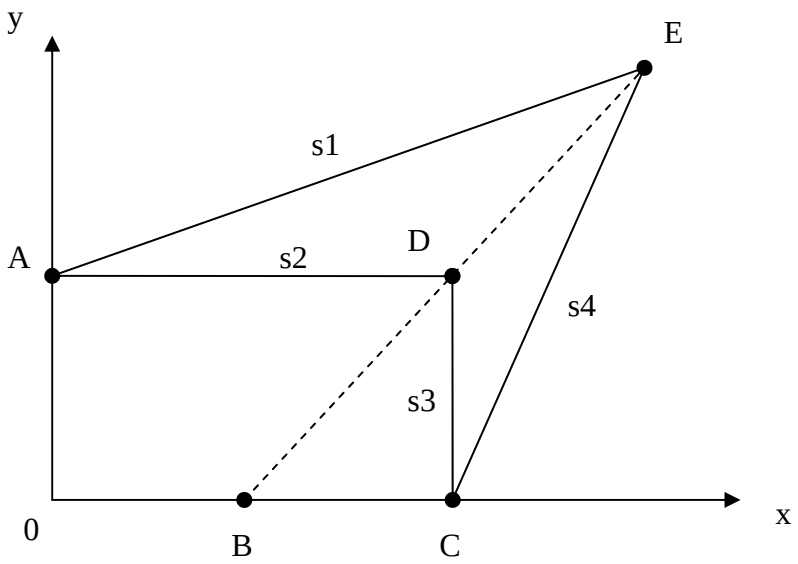
Homework No. 7

handed out Thursday, November 26, 2015
due Thursday, December 03, 2015, 09:10 **Name:** _____

Adjustment with Constraints and Added Parameters

1. We are interested in the coordinates of points D and E. Four distances are measured: s1 = 12.41, s2 = 8.06, s3 = 3.87, and s4 = 8.83. All are assumed uncorrelated and of equal precision. Points A (0, 4), B (4, 0), and C (8, 0) are known (errorless) coordinates. Consider the following three cases:
   I. No more information than above.
   II. In addition to above, points B, D, and E lie on a straight line.
   III. In addition to cases I and II, D is the midpoint of BE.

   For each of the cases:
   1) Calculate the LSQ estimates of the coordinates of points D and E and their corresponding cofactor matrix.
   2) For cases II and III, apply two different LSQ techniques with constraints.



Courtesy of EMM03

Your (individual) final report should contain (use A4 papers):

- this page as the cover sheet
- source code(s) and outputs; do not forget to add your name and lots of comment cards to the source listing (% .....)
- input and output files from program [input/output values used and calculated], if any
- plots, including captions on axes, title, your name, LB#/HM#, course title, date (if any)
- derivation and description of formulas used, accompanied by figures where applicable
- evidence of computational accuracy
- discussion of results