



Department of Geography

Examination paper for GEOG2009 - Vector Based GIS

Academic contact during examination:

Jan Ketil Rød

Phone:

995 56 432

Examination date:

30th May, 2016

Examination time:

3 hours

Credits:

7.5

Grades to be announced on:

20th June, 2016

Permitted examination support material:

Calculator

Other information:

The following basic calculators are permitted:

- Casio fx-82ES PLUS
- Citizen SR-270X and Citizen SR-270X College
- Hewlett Packard HP30S

Language:

English

Number of pages:

3

Number of pages enclosed:

0

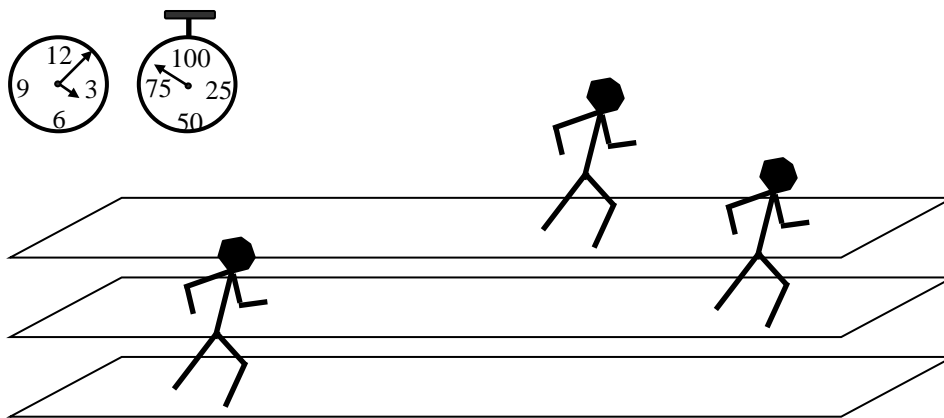
There are **four tasks** for this exam. It is expected that you do all. The four tasks are weighted as indicated in brackets.

1. Explain short but concise the following concepts: (10%)

- a. Euclidean distance and geodesic distance
- b. Vertex and node

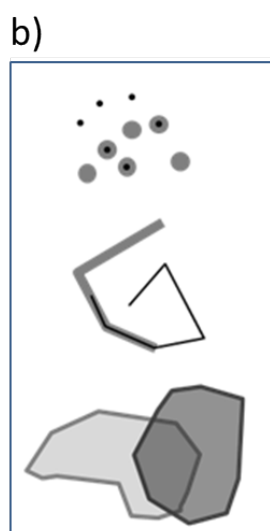
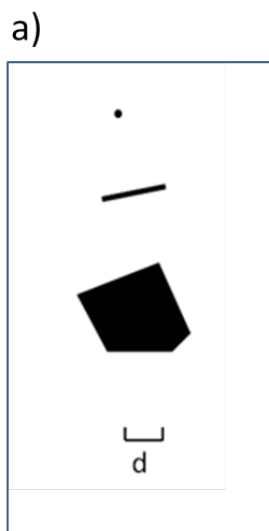
2. Representation (25%)

- a) How GIS represent our world is often a choice between raster and vector representations. What are the differences between these two data structures?
- b) Descriptions of geographic object are often stored as what is called attribute data. The attribute data can be described by their measurement level. What are the common levels of measurement used?
- c) Based on the figure below showing three persons running a race, give examples on variables on different levels of measurement which will describe the situation.

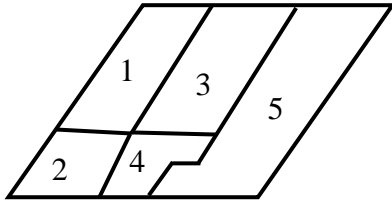


3. Techniques (25%)

- a) The figure a) below shows a point feature, line feature and a polygon feature. Given the buffer distance indicated (the distance d) make a sketch of the resulting three buffered features.
- b) The figure b) below shows point, line and polygon features from two different layers. The light grey shaded features are from layer A and the dark grey shaded features are from layer B. Make a sketch showing the three results of the Intersect operations (A AND B).

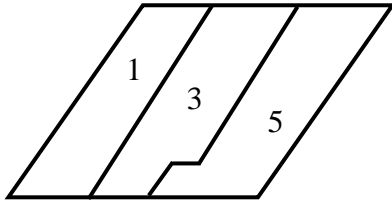


4. Vector overlay (40%)



ID_1975	Landuse1975
1	Forest
2	Forest
3	Urban
4	Urban
5	Farming

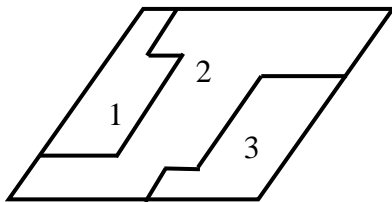
Figure 4.1 Land use in 1975 - Map and its attribute table.



ID_1975	Count	Landuse1975
1	2	Forest
3	2	Urban
5	1	Farming

Figure 4.2 Land use in 1975 - Map and its attribute table.

- a) The map and its attribute table shown in Figure 4.2 is the result of a GIS function applied on the map shown in Figure 4.1. Describe briefly the GIS function used.



ID_2000	Landuse2000
1	Forest
2	Urban
3	Farming

Figure 4.3 Land use in 2000 - Map and its attribute table.

- b) Based on the maps shown in figure 4.2 and 4.3 your task is to identify areas where there have been land use changes between 1975 and 2000. Which GIS operation would you apply for this task? Outline with one or more sketches the result of this operation.
- c) Show, for instance on one of the sketches from task 4b, areas where there have been changes in land use
- from forest in 1975 to urban areas in 2000, and
 - from farming in 1975 to urban in 2000.
- d) Formulate SQL statement you could use to identify the areas that have changed
- from forest in 1975 to urban areas in 2000, and
 - from farming in 1975 to urban in 2000.