The exam has three tasks. It is expected that you do all. The questions are weighted as indicated in parentheses. You may answer in Norwegian.

1. Give a short but concise explanation for the following concepts (20%)
   a. On the fly projection
   b. Geovisualization
   c. Vector data
   d. SOSI standard

2. Questions and answers (30%)
   a) Name five of Bertin’s visual variables and explain when they should be used to symbolize map.
   b) One of the sources for uncertainty in GIS representation is vagueness and ambiguity related to attributes. What is meant by that? How can fussy approach potentially help in resolving the issue?
   c) An extract of the attribute table for a conflict layer is given in the table to the right. It has the following attributes:
      • Country: Name for the country that was involved in the conflict
      • Year: Indicates the year when there was conflict
      • Radius: Gives the extent of the conflict in kilometers
      • Type: Indicates the type of conflict:
        1 = international conflict
        2 = colonial conflict
        3 = internal conflict
        4 = internal internationalized conflict

   Write the SQL that selects (one SQL per task):
   i. Countries with conflict in 1979
   ii. Countries that were involved in colonial conflict sometime during the period from (and inclusive) 1950 to (and inclusive) 1959.
iii. Countries with international conflict and countries having any type of conflict with a radius 300 km or larger.

3. Essay: Write an essay on spatial join, spatial query and polygon overlay. Use illustrations in your essay. (50%)