Module 1 - Basic introduction to using GIS software

Unit 05 - Querying and selecting data

1 Learning outcomes

- To have an understand of database queries
- Be able to use arcview internal SQL based query language to construct complex queries to select records within a and to display results in on a map
- To sound grasp of spatial queries
- To be able to perform spatial queries using arcview

2 Activities and exercises

2.1 GIS and technical concepts introduced

- The syntax and basic rules of structured query language (SQL)
- Set theory and the use of logical operators
- Map logic – containment, adjacency etc

2.2 GIS functions taught

- Interactive map-based feature selection and data interrogation
- Setting attribute table display properties
- Sorting tables by selected fields
- Building simple queries
- Combining queries using logical operators AND OR NOT XOR and set theory functions
- Geographic feature selection using drawn graphics
- Theme-based feature selection (containment, adjacency and intersection)
- Spatial joins

2.3 Teaching activities

- Demonstration of how to use specific buttons and menu items related to function detailed above, using the instructors computer linked to video projector
- Repetition of the acview functions by students using Lao national geographic data sets
- Conducting exercises specified below
- Provision of one on one tuition during the completion of student exercises

3 Exercises

Exercise 1 Performing queries to identify provinces with poor education indicators

The scenario for this exercise is that the national EFA planning committee has identified certain provincial education indicators by which to judge education service delivery. The students are asked to perform queries to identify provinces that fall below set cut off points for a set of provincial indicators.

- Load the province theme
- Load the school.dbf file
- Summarize the table by Pcode to generate the following provincial indicators:
  - Sum_no teachers
  - Sum_no pupils
  - Sum_G1 (total male and female students)
  - Sum_G2 (total male and female students)
- Load the provincial indicator table into ArcView
- Create the following fields in the provincial indicator table:
  - Pupil teacher ratio
  - Male female for students
  - Ratio grade 1 to grade 5 students
  - Student/class ratio
  - Grade 1 f/m ratio
  - Grade 5 f/m ratio
- Note the mean, maximum, and minimum values of each of the calculated fields
- Join the provincial indicator table to the province theme using PCode
- Ask the students to perform simple queries and compound queries using Boolean logic to select provinces. The cut-off points for the queries can be derived by using the mean values of the calculated indicator fields.
- Students should be asked to report number of provinces meeting criteria for each EFA goal
- Discussion can be held to create a query including a discussion of cut-off points to select provinces that have and have not reached EFA goals
- This exercise can be repeated for school level data for a single province by selecting creating a school event theme, using theme definition query to select schools for a single province and perform queries on the selected schools

Exercise 2 Selecting schools using Geographic query functions
- In this exercise the students are asked to look at the schools in one province and use a variety of geographic search functions to select schools
- Load province, district and road themes
- Add the school.dbf file
- Create an event theme for schools
- Use theme definition properties to select data for a single province – apply to the district and school themes
- Identify the district capital
- Ask students to use radius search to identify schools within 5 km of district capital
- Report the number of schools selected. Repeat for 10 and 15 km search radii
- Ask student to select all schools within a selected district using the select by theme function
- Ask the students to perform a number of other geographic searches and in each case, report the number of schools selected

4 Q and A
- Specific questions are posed in the context of exercises 1 and 2 above
- Answers are provided orally or written down on a piece of paper for later verification.
- A period of question and answer is provided during at the conclusion of the instructor lead demonstration and at the end of the

5 Summary and review of concepts and s/w functions
- Review of morning session at the start of the afternoon session
- Review of the days session including problems/issues identified in the afternoon session at the end of the afternoon
6 Materials and data

Materials
- Video projector
- White board
- Student handout – Unit 1 Module 05 Querying and selecting data

Exercise 1 data
Lao geo-data C:\training\Lao\WGS84
C:\training\dbf\schools.dbf

Exercise 2 data
Lao geo-data C:\training\Lao\WGS84
C:\training\dbf\schools.dbf

7 Sequence and timing
- To be delivered after unit 04
- 3 hours of class time for instructor-lead teaching session
- 3-4 hours in the afternoon, to complete exercises, explore ArcView more deeply and review morning instruction

- Morning session used for instructor led teaching of functions and student practice of taught functions and command.
- Afternoons session are used to provided:
  - time to review morning session functions to cover material not covered during the morning session
  - independent student practice to complete exercise – supervised by two instructor offering one on one tuition