



Aalto University  
School of Arts, Design  
and Architecture

# MAR-E1004 Basics of GIS: Modifying data in a GIS

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# Learning goals

**In this session you will learn**

- **To edit data objects manually**
- **To create new layers**
- **To create new attributes and calculate them based on existing ones**
- **To create points from a table**
- **To join attributes**

# Data

**Data for this set of slides is marked as Data for session 2 in MyCourses.**

# Data editing in ArcMap

- **Selections and queries do not edit the data files**
- **In order to edit, you need to use Editor-toolbar from Customize -> Toolbars -> Editor, and from the toolbar Editor -> Start Editing**
- **Use the building data set from earlier sessions: try removing excess buildings, adding missing buildings (with Create Features – window), giving them attributes using Attribute Table (or Attribute window from the toolbar), and moving the location of buildings**
- **Snapping can be controlled from Editor -> Snapping -> Snapping Toolbar**
- **Edits have to be saved from Editor -> Save Edits**
- **Remember to stop editing from Editor -> Stop Editing! Many tools will not work if editing is on.**

# Creating new layers and drawing in ArcMap

- To create new layers, open Catalog (Window -> Catalog), right-click a folder New -> Shapefile. You need to define name, type and coordinate system
- Create a layer for polygons, and try drawing one in Otaniemi. Double-click ends the polygon. Also try Edit Vertices, Cut Polygons and Merge (requires selecting at least two polygons) tools
- This how general drawing happens in a GIS; drawing new objects is an exception in GIS practice

# Creating and calculating attributes

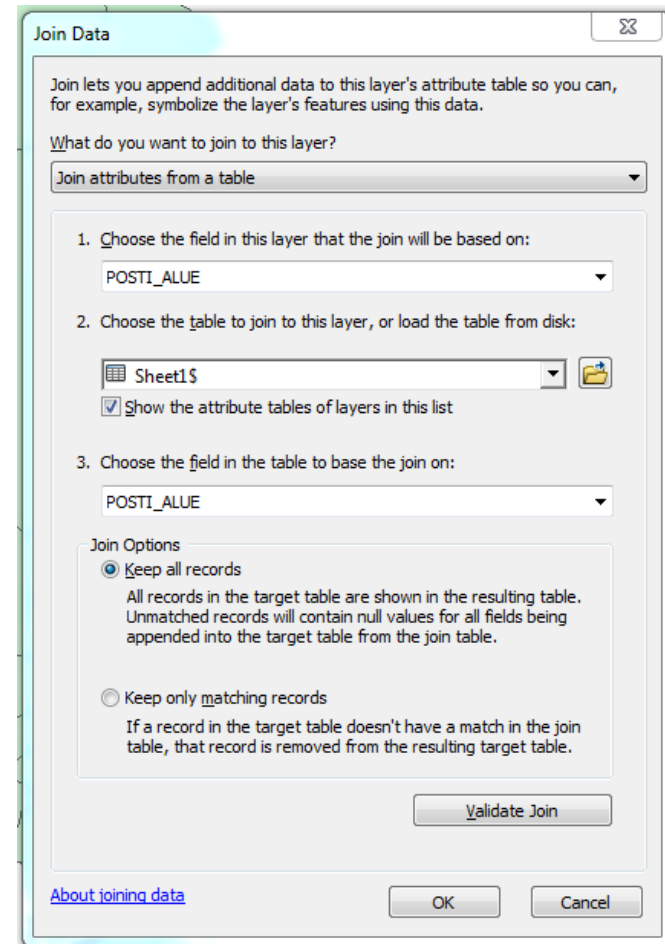
- **If you need to create a new attribute, open the attribute table and choose Table Options (upper left corner) -> Add Field. Give the attribute a name and choose the right type**
  - Integer for integer values (kokonaisluku)
  - Float and Double for decimal values
  - Text for text; you can also have numbers as text, for example POSNO attribute in session 1
- **You can't have editing on to add a field.**
- **To calculate values based on other attributes, right-click an attribute and choose Field Calculator**
- **Task: Create a map that shows the proportion of single-room apartments in Espoo. ASLKM is the total number of apartments and AS1 the number of single-room apartments**
  - To avoid dividing by zero, first you need to select only the buildings that have apartments using Select by Attributes; then the calculation will be done for these buildings only
- **To visualize a continuous attribute, use Quantities and Graduated colors in Symbology. Select the right attribute for the Value and click OK.**

# Data from table

- **Manual editing is cumbersome for larger data sets; it's easier to bring data from a table**
- **The Excel file for PRONTO data includes coordinates; we will show them on a map**
  - Q1: What is the data about?
  - Q2: Which coordinate system has been used for the data?
- **Add the table to ArcMap using File -> Add Data (at least one of the files should work); remember to close Excel first!**
- **Right-click the layer and choose Display XY Data to create points based on attributes in a table**
- **Choose Itäkoord. (=east) for X and Pohjoiskoord. (=north) for Y and the right coordinate system (Finland Zone 3)**
- **The layer is only a temporary one; right-click it and choose Data -> Export Data to create a new file**

# Join attributes

- Sometimes you have one layer with spatial objects and another with attributes for them.
- Add more attributes to the postal\_code –layer from the occupation-tables (both of these are actually open source data called Paavo, Postinumeroalueittainen avoin tieto)
- Open both the layer and one table in ArcMap; you'll see that they share a common attribute: POSTI\_ALUE (the attributes do not need to have the same name; just the same values)
- Right-click the postal\_code layer and choose Join and Relates > Join; different options in the tool:
  - 1. the common field in the first layer
  - 2. the table (can also be a spatial layer) from which attributes will be joined
  - 3. the common field in the second layer (or table)
- After the join, check that new attributes appeared for the postal code area polygons





# Homework 1

- **Create a map of Espoo that shows the proportion of students from the whole population per postal code area by creating a new attribute for the proportion.**
- **The attributes with the prefix PT\_ describe occupation: PT\_VAKIY is the total and PT\_OPIISK is the amount of students.**
- **Submit the map and answer the following question: Is there something odd about some proportion values? What? What could be causing this?**
- **Create and submit another map that does not have the problem with the odd proportion values.**