VECTOR ANALYSIS

USING ARCVIEW

HANDS-ON

Topics Learning in the exercise

1. Buffering

2. Dissolve

3. Merge

4. Clip

5. Intersection

6. Union

7. Spatial Join

1. Buffer

1.1 Loading the buffer menu
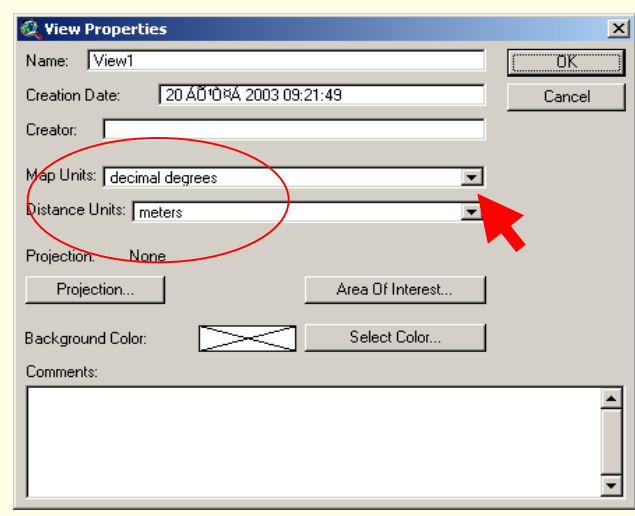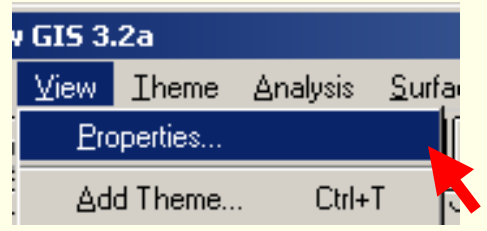
1.2 Creating buffers around all features in a theme

1.3 Creating different buffers in a theme

1.4 Creating buffers around selected features in a theme

1.5 Selection within buffer

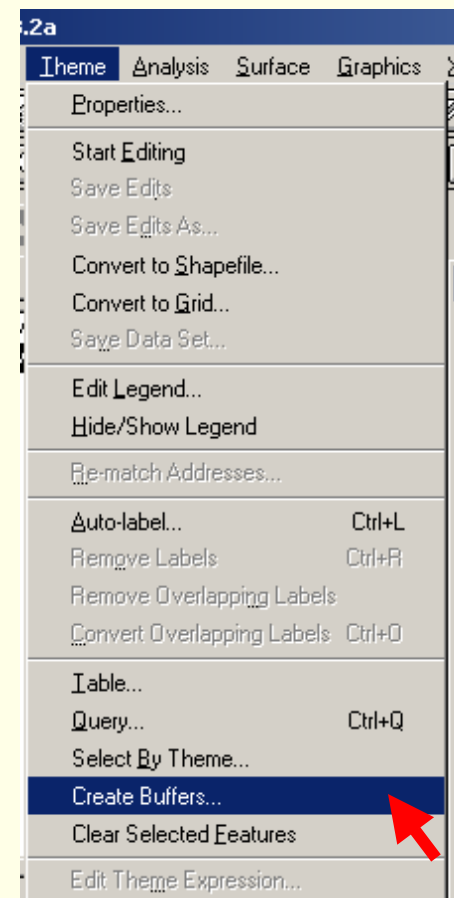# 1.1 Loading the buffer menu

-Add theme "District_hospital.shp"

-Select Create Buffer at theme menu

-If Create Buffer option is disappear,

 it's because of unsetting of View's properties

-Go to View menu and select Properties

-Select Map Unit and Distance Unit

-Click OK
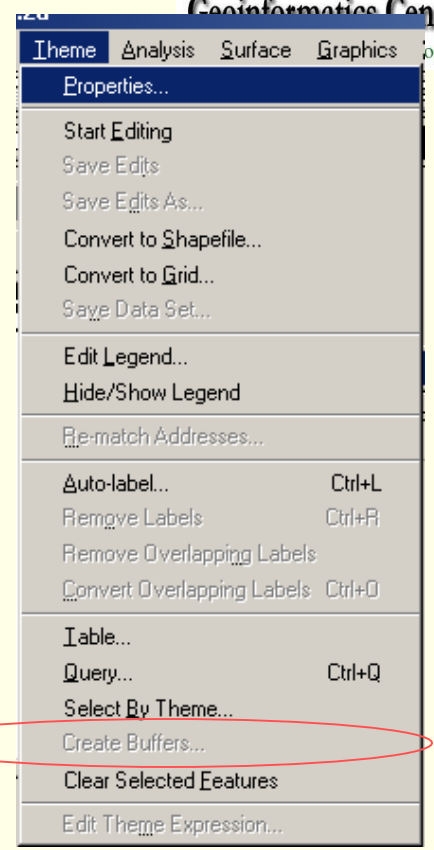
1.2 Creating buffers around all features in a theme
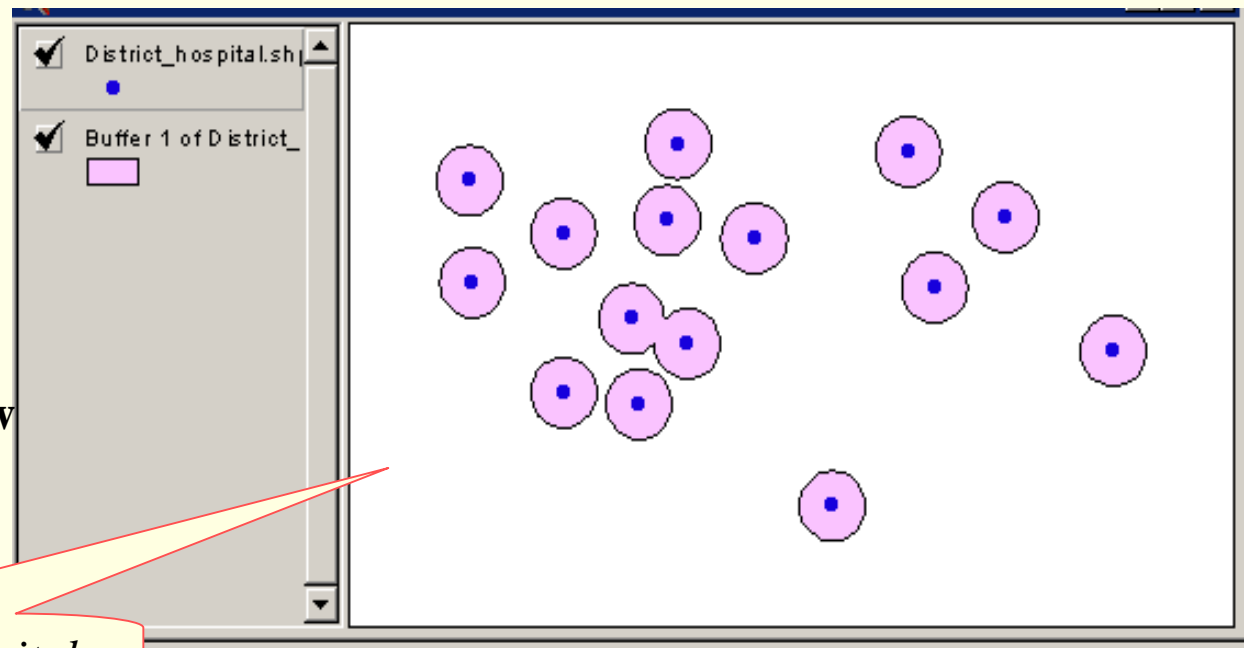
-Activate theme "District_hospital.shp"

-Select Create Buffer at theme menu

-Once Create Buffer wizard is loaded

-Select the feature of a theme name

 "District_hospital.shp"

-Then click Next>> button

10

Create Buffers

How do you want to create buffers?

- ◉ At a specified distance   `10`
- ○ At a distance from an attribute field   `Vcode`
- ○ As multiple rings
  - number of rings: `3`
  - distance between rings: `500`

Distance units are: `Kilometers`

Help...   Cancel   << Back   Next >>

Create Buffers

Dissolve barriers between buffers?   ○ No   ◉ Yes

Where do you want the buffers to be saved?
- ○ as graphics in the view
- ○ in an existing theme `Buffer 1 of District_hospital.shp`
- ◉ in a new theme `d:\training\health-gis\buff_dh.shp`

Help...   Cancel   << Back   Finish

-Define buffer properties

-Click Next >>

-Select Dissolving of buffers

-Select a way to save buffers

-Click Finish

-Open buffers to View Window

☑ District_hospital.shp •

☑ Buffer 1 of District_

Buffers 10 Km. of district hospitals

In order to specify distance of Health facility's serviceable area. This step we will create different sizes of buffer based on type of health facilities.

-Activate theme
"Health_facility.shp"
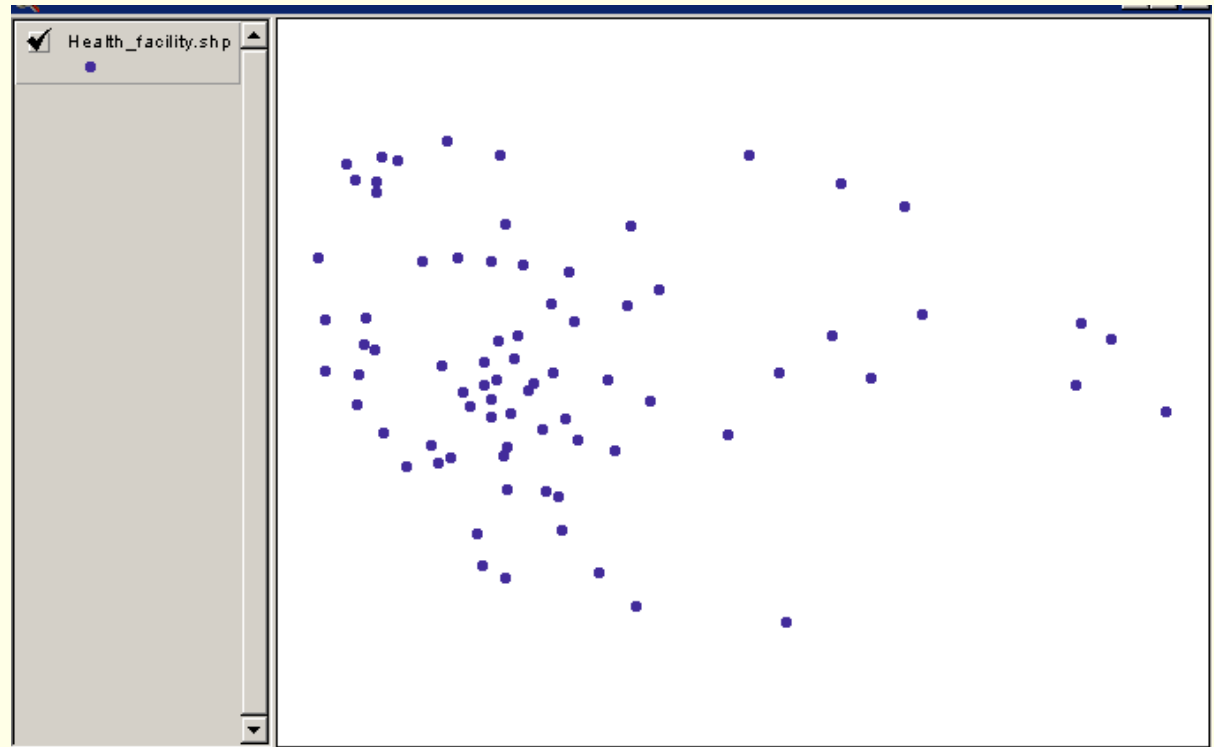-Select Create Buffer at theme menu
-Select the feature of a theme name
"Health_facility.shp"
-Then click Next>> button
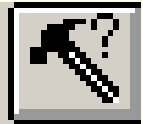
-Open attribute table of
"Health_facility.shp"
-Select start editing
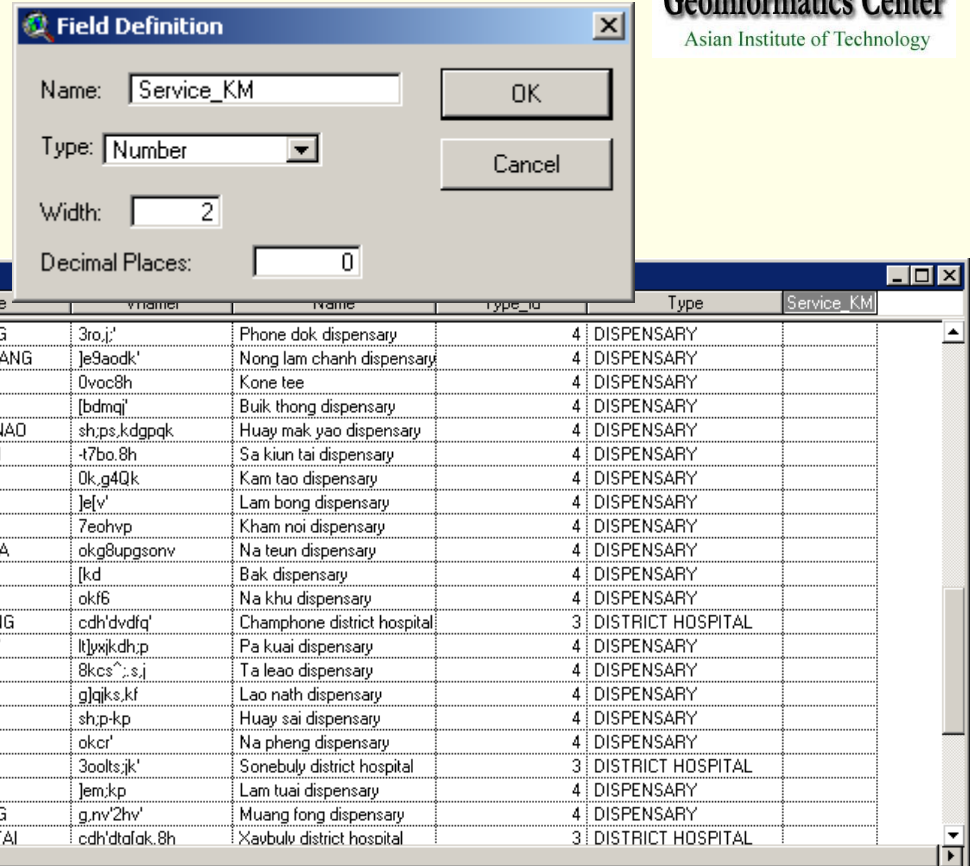at Table menu
-Add new field to
Name "Service_KM"
-To specify distance
of health facility's
serviceable.
Use Query Build Tool [ ] find
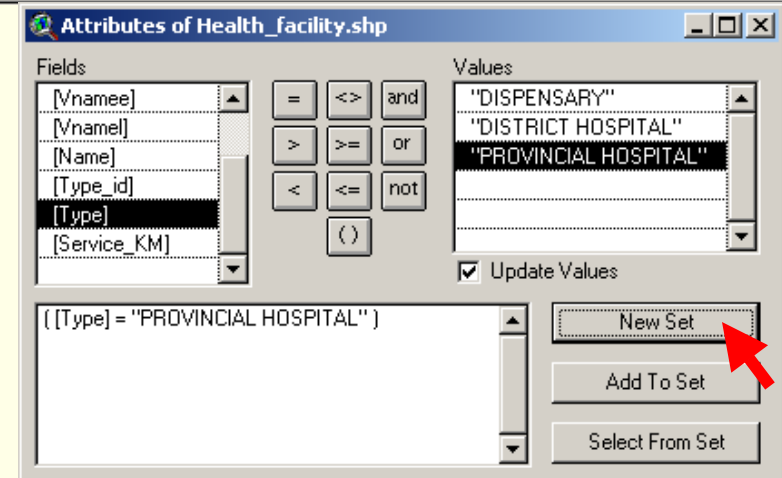Type of health facilities and define
distance of serviceable.

-After selected a type of health

Facility, use Calculator tool

To define distance of buffer.

Condition:
Provincial Hospital = 10 Km.
District Hospital = 5 Km.
Dispensary = 2 Km.
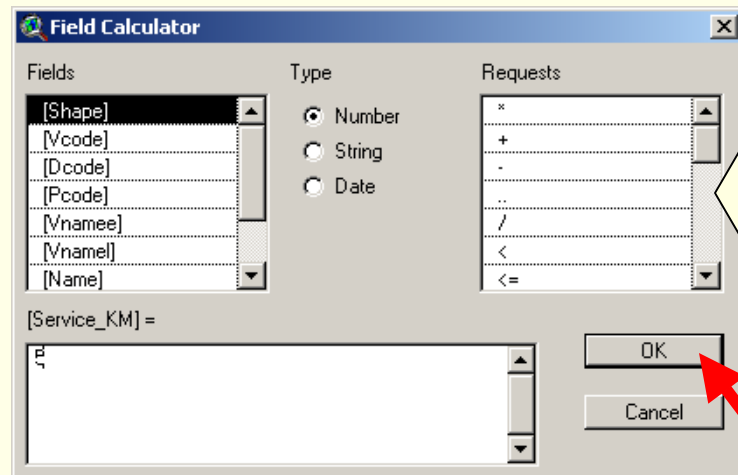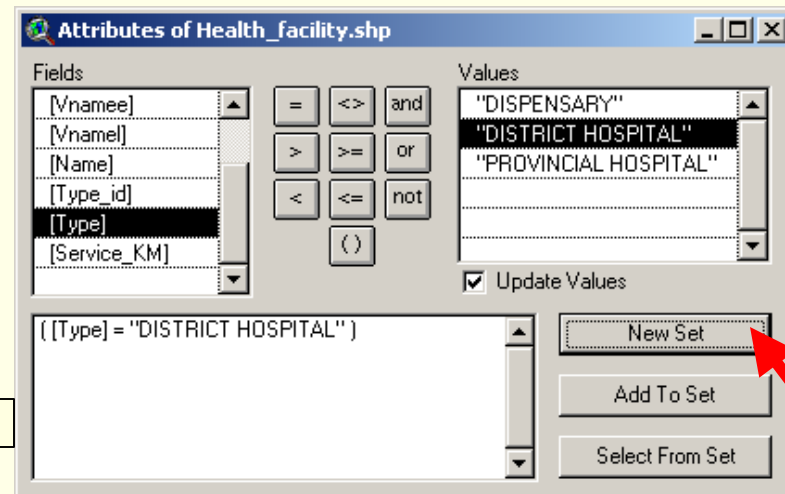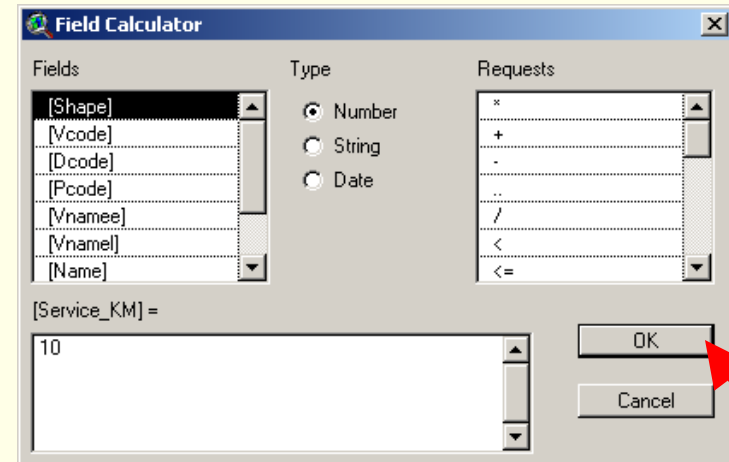
-Once finished inputting,

Select Save and Stop

Editing in Table Menu.

-Then Select Create Buffer

In Theme Menu.

-Select "Health_facility.shp"

As the features of a theme, then click at the 2nd option in next window.

Attributes of Health_facility.shp

Shape	Vcode	Dcode	Pcode	Vnamee	Vnamel	Name	Type_id	Type	Service_KM
Point	0	0	0				1	PROVINCIAL HOSPITAL	10
Point	1303050	1303	13	MAINAHOU	.s,jokm6h	Palanxay district hospital	3	DISTRICT HOSPITAL	5
Point	1304002	1304	13	PASOMXAY	xtlq,w-	Phine district hospital	3	DISTRICT HOSPITAL	5
Point	1303023	1303	13	TABONGPHET	8t[v'graf	Atsapangthong district hospi	3	DISTRICT HOSPITAL	5
Point	1310029	1310	13	NONSAVANG	3oolts:jk'	Sonebuly district hospital	3	DISTRICT HOSPITAL	5
Point	1311002	1311	13	KENGKABAO TAI	cdh'dtg[qk.8h	Xaybuly district hospital	3	DISTRICT HOSPITAL	5
Point	1309126	1309	13	KENGKOKDONG	cdh'dvdfq'	Champhone district hospital	3	DISTRICT HOSPITAL	5
Point	1301110	1301	13	DANH	fjko	Xayphuthong district hospit	3	DISTRICT HOSPITAL	5
Point	1312052	1312	13	BOUNG	[5j'	Vilabuly district hospital	3	DISTRICT HOSPITAL	5
Point	1301128	1301	13	NAKHAM NUA	ok7egsonv	Na kham dispensary	4	DISPENSARY	2
Point	1301119	1301	13	PHONSOMPHONG	3rolQ,3l'	Phone som hong dispensary	4	DISPENSARY	2
Point	1301106	1301	13	THAPHO	mjk3r	Tha pho dispensary	4	DISPENSARY	2
Point	1302041	1302	13	PHONEDEUA	3rogfnjv	Phone duea dispensary	4	DISPENSARY	2
Point	1302058	1302	13	PHONEPHANG	3rozk'	Phone fang dispensary	4	DISPENSARY	2
Point	1303009	1303	13	NACHANH	ok9ko	Na chan dispensary	4	DISPENSARY	2
Point	1303014	1303	13	DONGKEUM	fq'db,	Dong kuem dispensary	4	DISPENSARY	2
Point	1302045	1302	13	NAPHOXAY	ok3rw-	Na pho sai dispensary	4	DISPENSARY	2
Point	1301102	1301	13	PHAKKHA GNAI	zad0t.sjp	Phak ka dispensary	4	DISPENSARY	2
Point	1303045	1303	13	MAICHATSANH	.s,j9aflao	Xay boua thong dispensary	4	DISPENSARY	2
Point	1301076	1301	13	XOGKANG	-vddk'	Sork dispensary	4	DISPENSARY	2
Point	1301062	1301	13	PHONSIM NUA	3roly,gsonv	Phone sim dispensary	4	DISPENSARY	2
Point	1304062	1304	13	HOUAYKHAM	sh:p7e	Na thom dispensary	4	DISPENSARY	2

Create Buffers

About buffers

Buffers are rings drawn around features at a specified distance from the features.

What do you want to buffer?

○ The graphics in your view

● The features of a theme

Health_facility.shp

Number of features: 77

Number of features selected: 0

☐ Use only the selected features

Help...   Cancel   << Back   Next >>

Create Buffers

How do you want to create buffers?

○ At a specified distance   1

● At a distance from an attribute field
Service_KM

○ As multiple rings
number of rings: 3
distance between rings: 1

Distance units are: Kilometers

Help...   Cancel   << Back   Next >>

-Choose a field to define distance of buffers

Create Buffers

Dissolve barriers between buffers?

○ No ⊙ Yes

Where do you want the buffers to be saved?

○ as graphics in the view

○ in an existing theme

⊙ in a new theme `d:\training2004\miniproject\service_hf`

Help...   Cancel   << Back   Finish

Buffer 1 of Health_

Health_facility.shp

DISTRICT H
DISPENSARY

Service_hf.shp

Village.shp
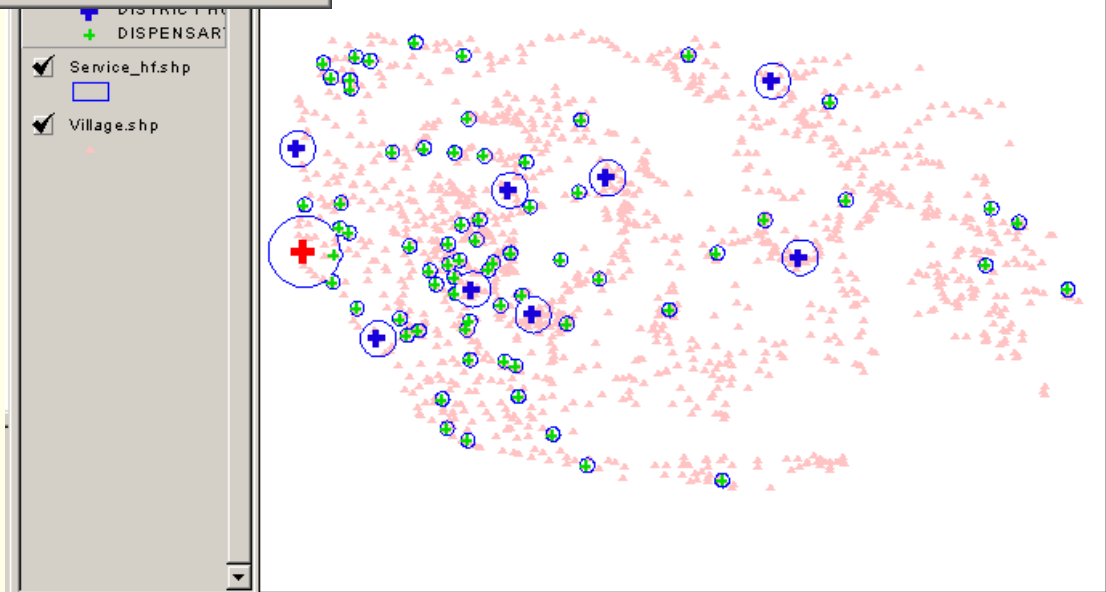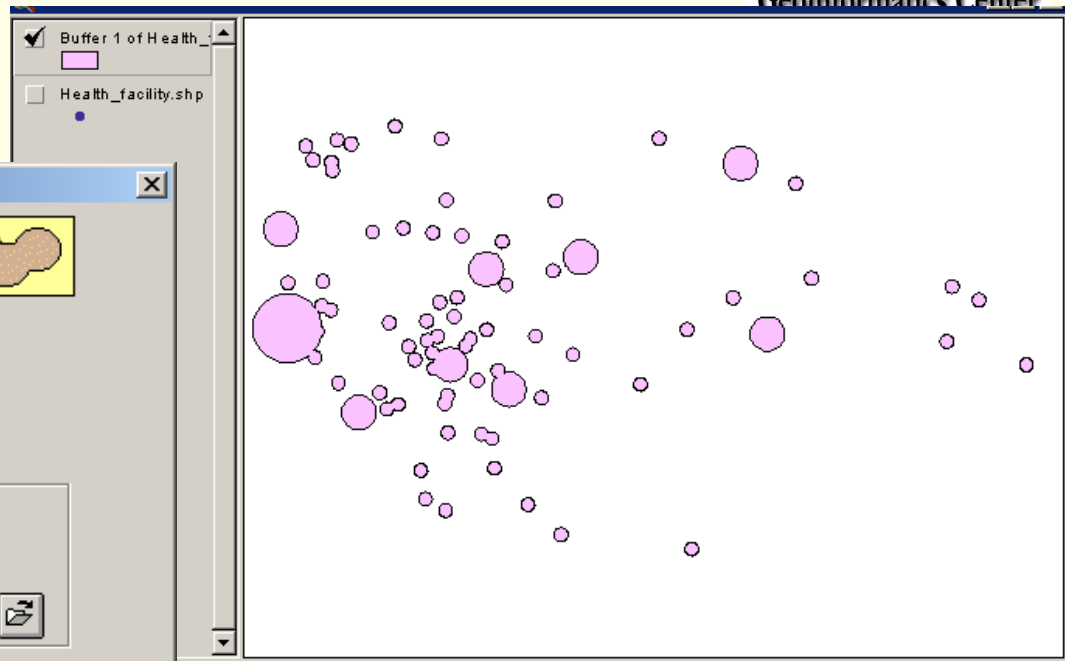
1.4 Creating buffers around selected features in a theme

The interested roads that we will make a buffer is National road. Therefore this road need to be selected before buffering.

-Add theme "roads.shp"

-Click Query Builder tool

-Type an expression

-Select Create Buffer in Theme menu

5
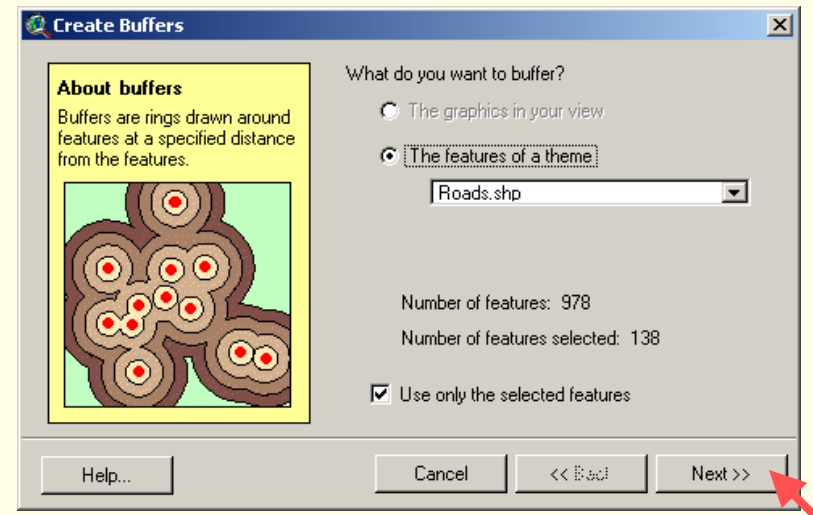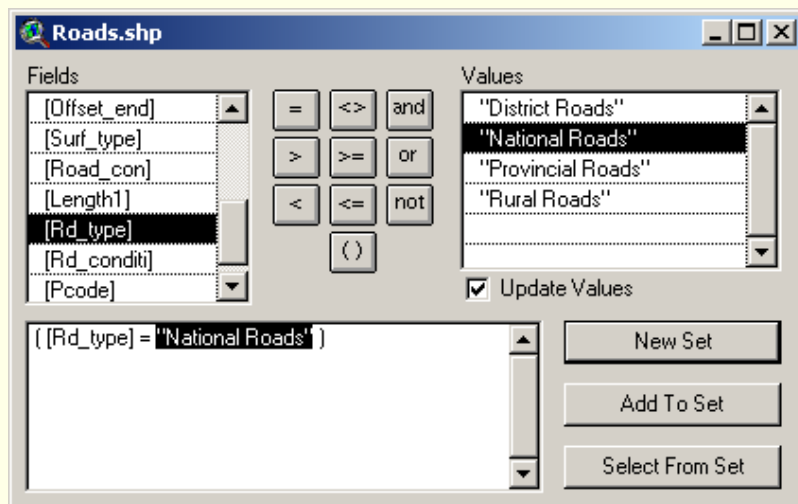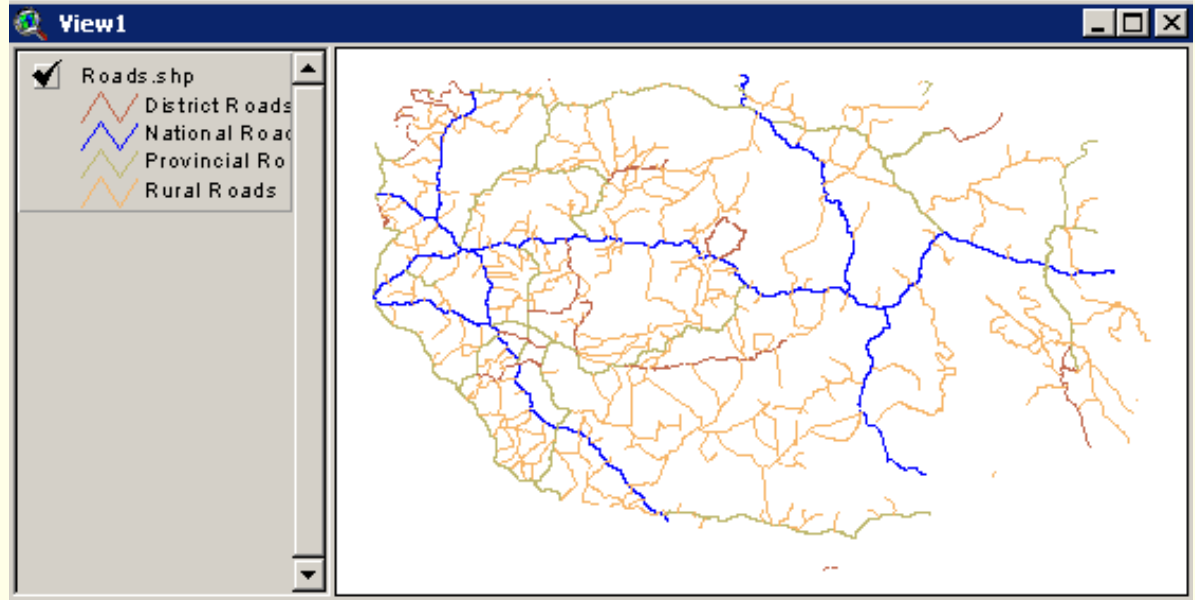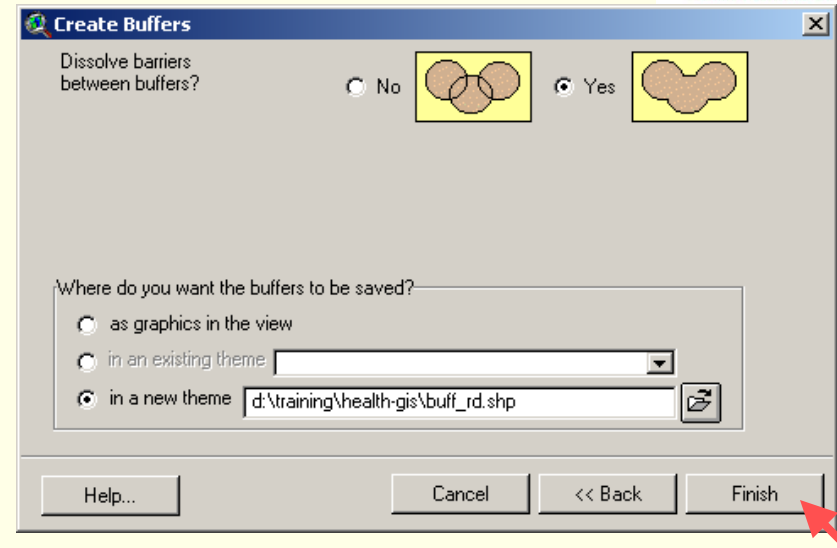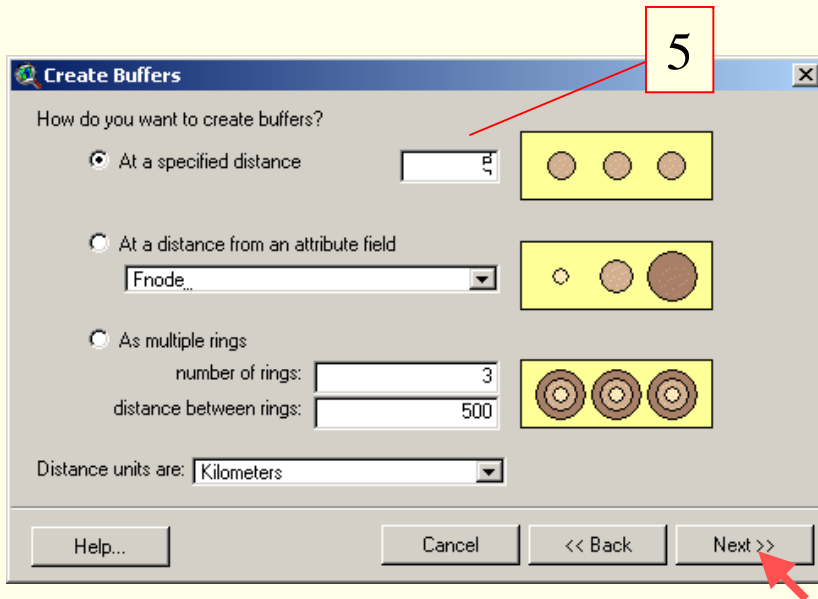
-Select buffer properties
-Navigate buffer of road
 to the working directory
-Add buffer of road theme
 in View window
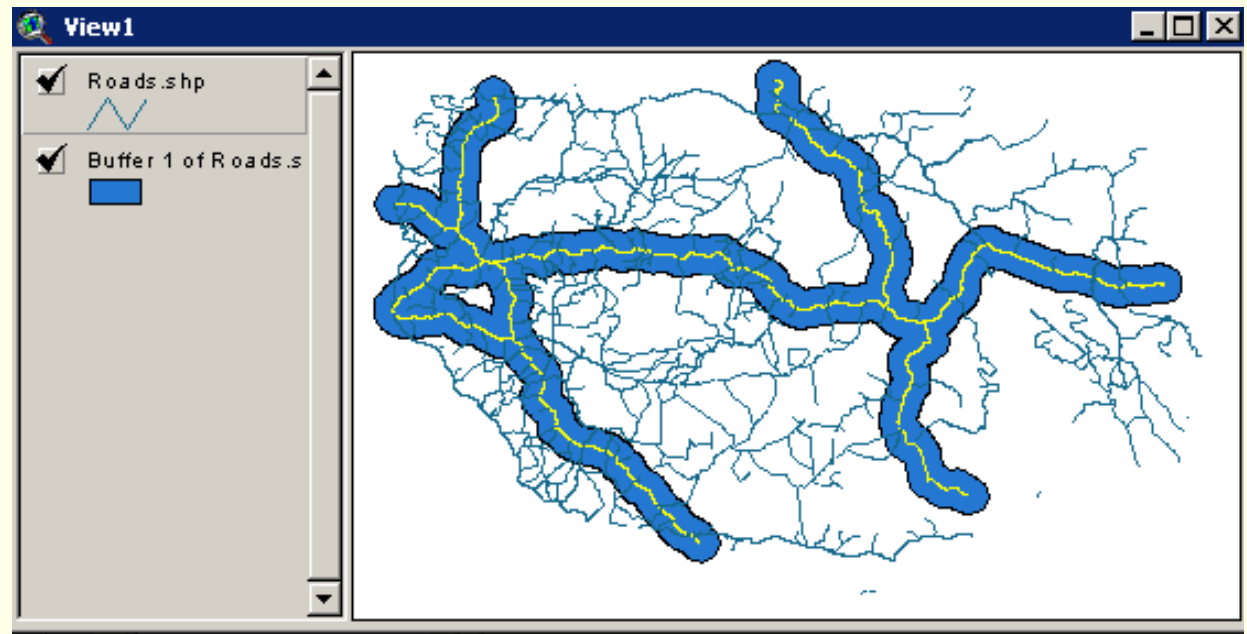
1.4 Selection within buffer

Once you have defined your buffer area, you may want to find how many villages fall within the road buffer.

-Add theme name "Village.shp"

-Add buffer of road   which we have done in previous step
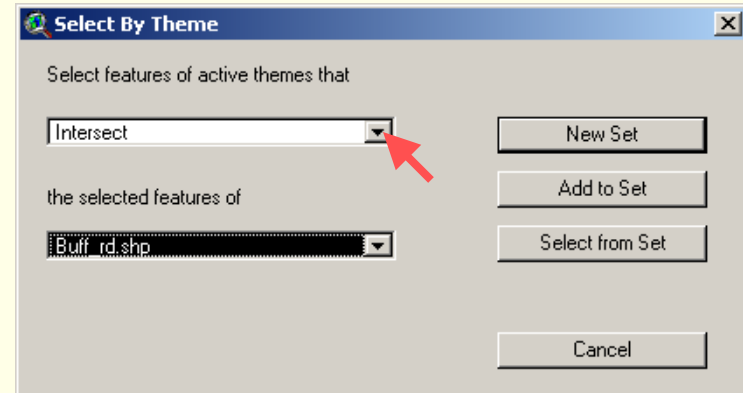
-Activate "Village.shp"

-Choose Select By Theme in Theme menu

-Select method to select and buffer theme, then click New Set
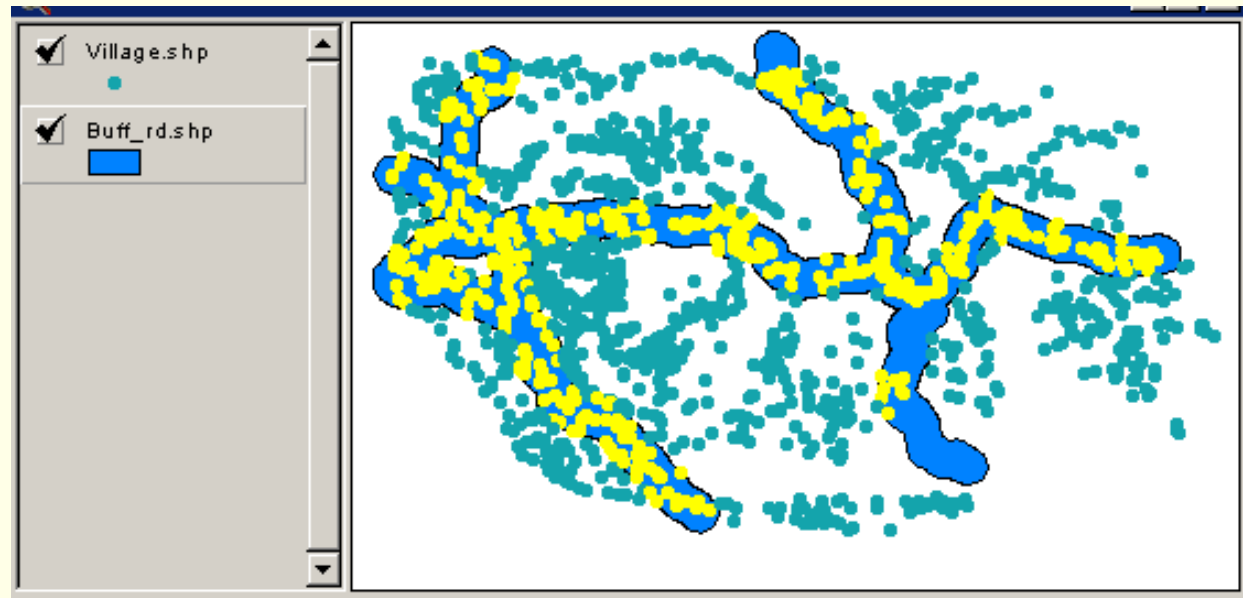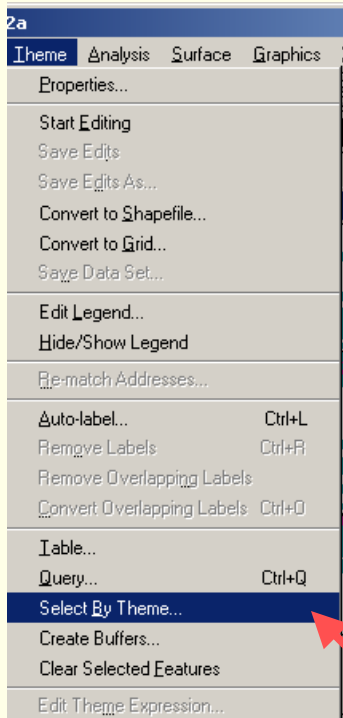
2.Dissolve

2.1 Open new view window and Add Theme

2.2 Loading Geo-Processing Wizard

2.3 Create Provincial Boundary from District Boundary

2.1 Open new view window and Add Theme

-Add Theme "District.shp"

-Open its attribute in order to

select a field use for dissolve
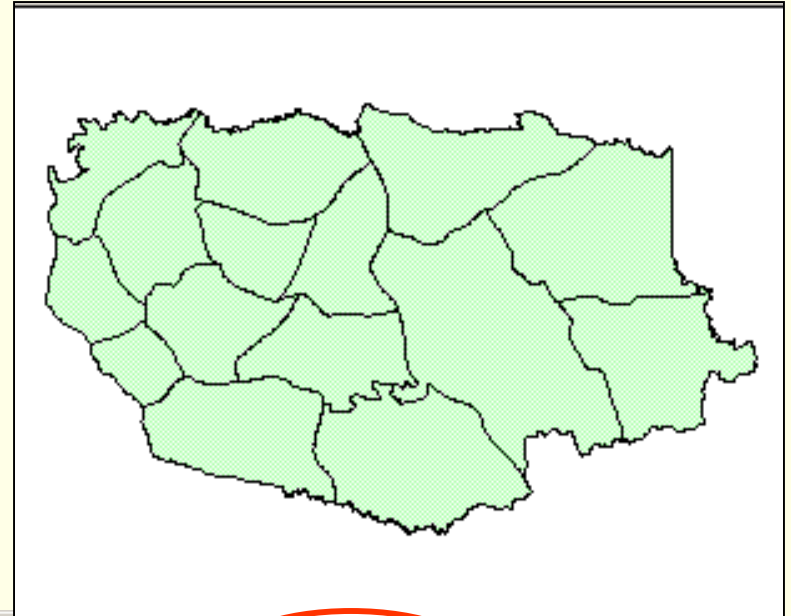
Shape	Pcode	Dcode	Dname	Sq_m	Sq_km	Pname
Polygon	13	1312	Vilabouri	1765107479.680	1765.107	SAVANNAKHET
Polygon	13	1311	Xaibouri	895945602.959	895.946	SAVANNAKHET
Polygon	13	1313	Atsaphon	1452316064.602	1452.316	SAVANNAKHET
Polygon	13	1305	Xepon	2266782030.519	2266.782	SAVANNAKHET
Polygon	13	1302	Outhoumphon	1082417234.996	1082.417	SAVANNAKHET
Polygon	13	1315	Phalanxai	998076585.390	998.077	SAVANNAKHET
Polygon	13	1303	Atsaphangthong	700937798.695	700.938	SAVANNAKHET
Polygon	13	1304	Phin	3372124542.212	3372.125	SAVANNAKHET
Polygon	13	1301	Khanthabouri	681611273.958	681.611	SAVANNAKHET
Polygon	13	1309	Champhon	1049758789.065	1049.759	SAVANNAKHET
Polygon	13	1306	Nong	1700596082.260	1700.596	SAVANNAKHET
Polygon	13	1310	Xonbouri	1205959535.145	1205.960	SAVANNAKHET
Polygon	13	1314	Xaiphouthong	454822663.925	454.823	SAVANNAKHET
Polygon	13	1308	Songkhon	1635816839.466	1635.817	SAVANNAKHET
Polygon	13	1307	Thapangthong	2115852184.956	2115.852	SAVANNAKHET

Attributes of District.shp

2.2 Loading Geo-Processing Wizard

Geoinformatics Center
Asian Institute of Technology

-Select Extension in File menu

-Check Box in Geopocessing

-Click OK

-In View menu, click GeoProcessing Wizard

-Choose the 1st option

-The click Next>> button

Extensions

Available Extensions:
- Digitizer
- ER Mapper Algorithms and Images Sup
- ✓ Geoprocessing
- Graticules and Measured Grids
- Grid Analyst Extension (Ver.1.1)
- Hydrologic Modeling v1.1 (sample)
- IMAGINE Image Support

OK
Cancel
Reset
☐ Make Default

About:

ArcView GIS 3.3

File Edit View Theme Su

- Close
- Close All
- Set Working Directory...
- Save Project   Ctrl+S
- Save Project As...
- Extensions...

GeoProcessing

Choose a GeoProcessing operation, then click the Next button to choose options.

- ◉ Dissolve features based on an attribute
- ○ Merge themes together
- ○ Clip one theme based on another
- ○ Intersect two themes
- ○ Union two themes
- ○ Assign data by location (Spatial Join)

About Dissolve

This operation aggregates features that have the same value for an attribute that you specify.

Input   Output

More about Dissolve

Help...   Cancel   << Back   Next >>

View GIS 3.3

View Theme Graphics XTo

- Properties...
- Add Theme...   Ctrl+T
- Geocode Addresses...
- Add Event Theme...
- New Theme...
- Themes On
- Themes Off
- Layout...
- TOC Style...
- Full Extent
- Zoom In
- Zoom Out
- Zoom To Themes
- Zoom To Selected
- Zoom Previous
- Find...   Ctrl+F
- Locate Address...
- GeoProcessing Wizard...

2.3 Create Provincial Boundary from District Boundary

Geoinformatics Center

-Select "District.shp" as theme to dissolve

-Select "Pcode" as an attricute to dissolve

-Click Next>> button

-Choose field and operations To be added in the output file
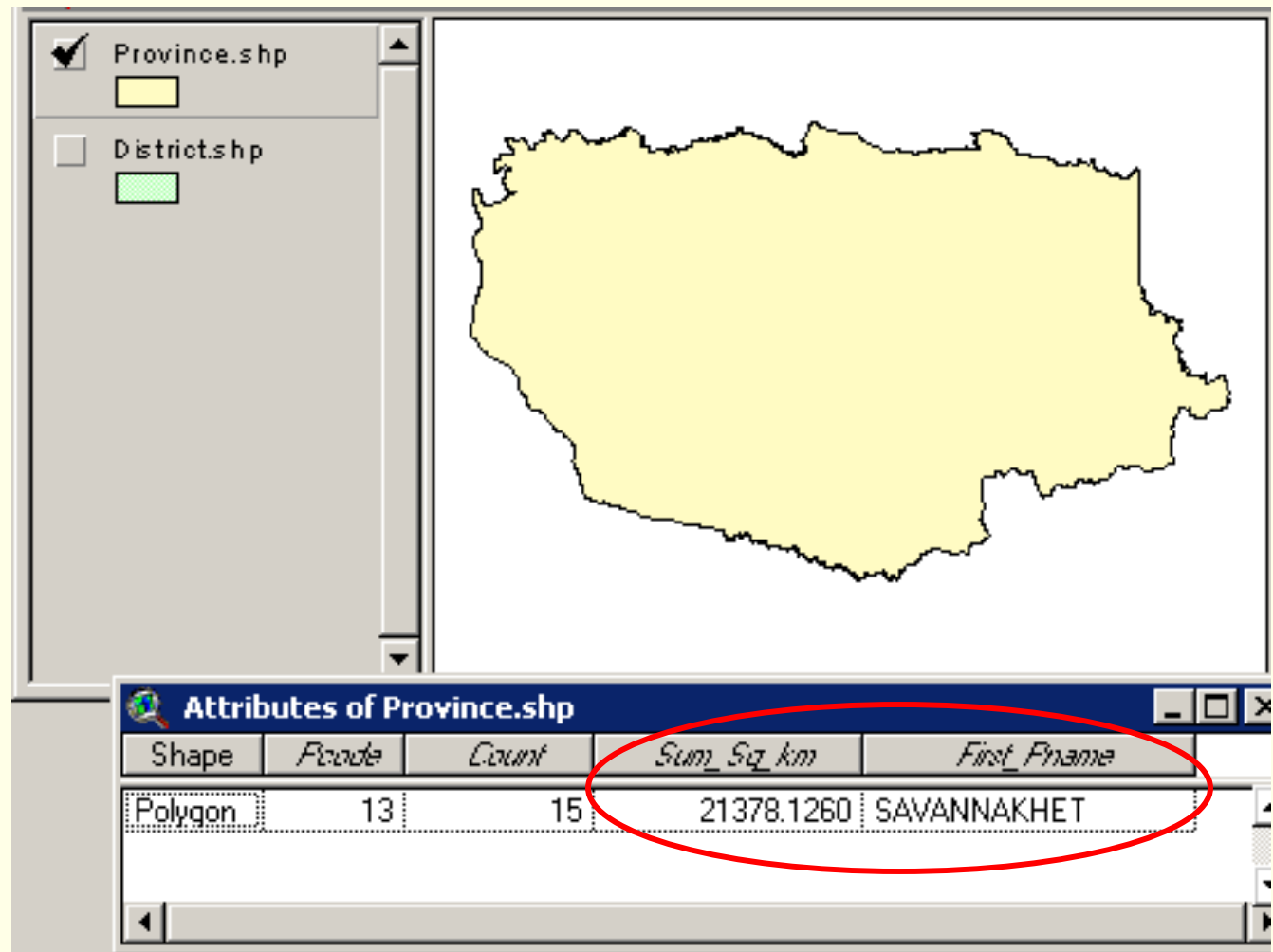
-Press Shift button in keyboard and click for many fields

-Click Finish button
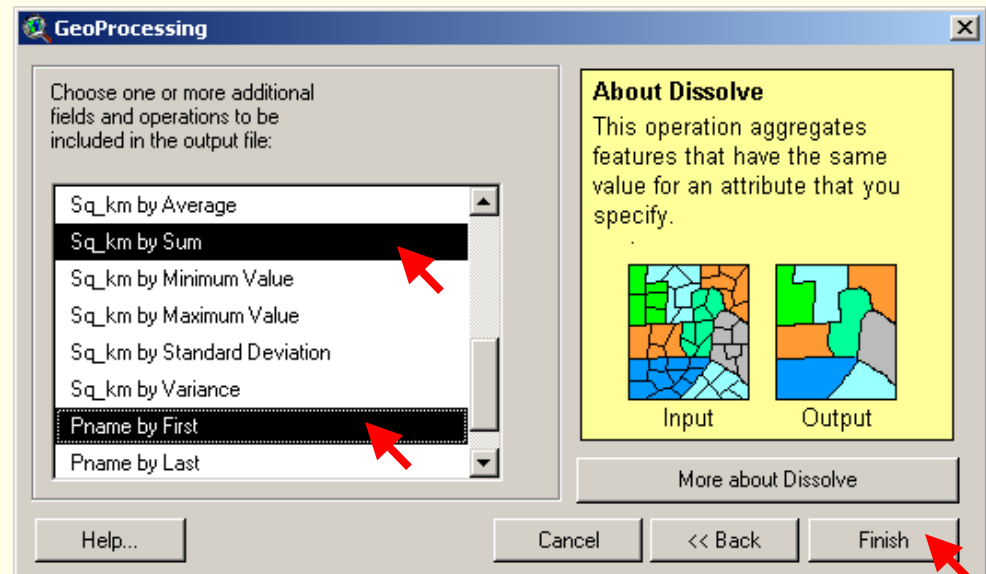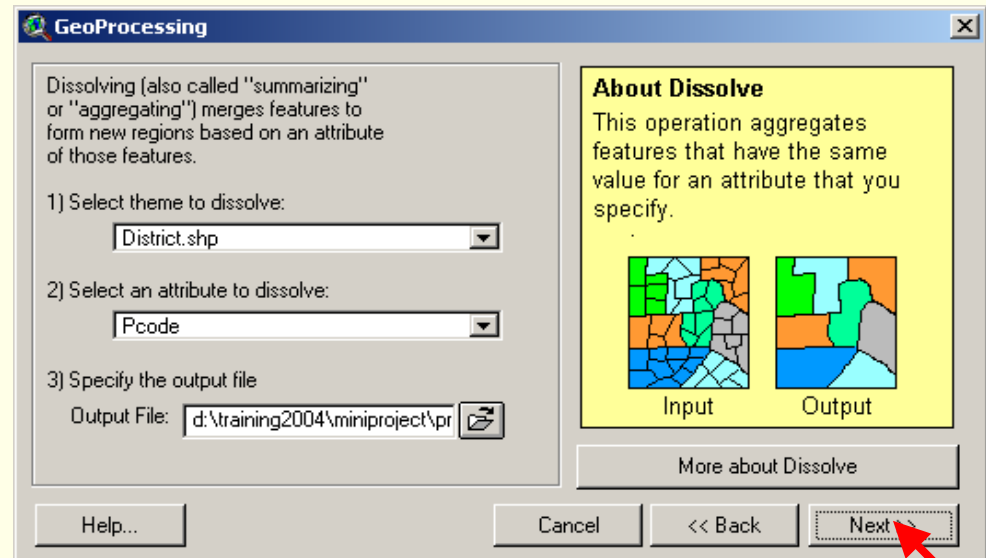
-Display output theme (Province.shp)

-Open Theme Table

3.Merge

3.1 Open new view window and Add Theme

3.2 Create whole administration boundary by merging

3.3 Display the administration boundary

3.1 Open new view window and Add Themes

-Add themes "Lao-n.shp",

"Lao-c.shp" and "Lao-s.shp"

View1

	Lao-s.shp
	Lao-n.shp
	Lao-c.shp

Attributes of Lao-n.shp

Shape	Pcode	Pname	Sq_m	Sq_km
Polygon	5	BOKEO	6982252954.09	6982.25
Polygon	7	HUAPHANH	17504314822.48	17504.31
Polygon	3	LUANGNAMTHA	9595355977.52	9595.36
Polygon	6	LUANGPHRABANG	19950541248.19	19950.54
Polygon	4	OUDOMXAY	11782408756.75	11782.41
Polygon	2	PHONGSALY	15454654827.43	15454.65
Polygon	8	XAYABOURY	15524626624.79	15524.63
Polygon	9	XIENGKHUANG	12701957617.82	12701.96

Attributes of Lao-c.shp

Shape	Pcode	Pname	Sq_m	Sq_km
Polygon	11	BOLIKHAMXAY	15694835140.13	15694.84
Polygon	12	KHAMMUANE	16706856844.05	16706.86
Polygon	10	VIENTIANE	12578463475.03	12578.46
Polygon	18	XAYSOMBOUN S.R.	7701525289.21	7701.53
Polygon	1	VIENTIANE MUN.	3583152218.77	3583.15

Attributes of Lao-s.shp

Shape	Pcode	Pname	Sq_m	Sq_km
Polygon	17	ATTAPEU	9541933838.71	9541.93
Polygon	16	CHAMPASAK	14966441773.95	14966.44
Polygon	14	SARAVANE	10153094263.01	10153.09
Polygon	13	SAVANNAKHET	21378124707.83	21378.12
Polygon	15	SEKONG	8388072691.37	8388.07

-Observe their attribute tables

3.2 Create whole administration boundary by merging

- In View menu, click
GeoProcessing Wizard
-Choose Merge Themes
together option
-Then click Next>> button
-In next window, press Shift
Button and click all three
Themes
-Select Based field and locate
The output theme directory
-Then click Finish button

GeoProcessing

Choose a GeoProcessing operation, then click the Next button to choose options.

○ Dissolve features based on an attribute
◉ Merge themes together
○ Clip one theme based on another
○ Intersect two themes
○ Union two themes
○ Assign data by location (Spatial Join)

About Merge

This operation appends the features of two or more themes into a single theme. Attributes will be retained if they have the same name.

Theme1 Theme2 Output Theme

More about Merge

Help...   Cancel   << Back   Next >>

Attributes of Lao-n.shp

Shape	Pcode	Fname	Sq_m	Sq_km
Polygon	5	BOKEO	6982252954.09	6982.25
Polygon	7	HUAPHANH	17504314822.48	17504.31
Polygon	3	LUANGNAMTHA	9595355977.52	9595.36
Polygon	6	LUANGPHRABANG	19950541248.19	19950.54
Polygon	4	OUDOMXAY	11782408756.75	11782.41
Polygon	2	PHONGSALY	15454654827.43	15454.65
Polygon	8	XAYABOURY	15524626624.79	15524.63
Polygon	9	XIENGKHUANG	12701957617.82	12701.96

GeoProcessing

1) Select at least two themes to merge:

Lao-s.shp - Polygon
Lao-n.shp - Polygon
Lao-c.shp - Polygon

Use fields from: Lao-n.shp - Polygon

2) Specify the output file:

Output File: d:\training2004\miniproject\laos.s

NOTE: The fields in the output will be the same fields as the first theme.

About Merge

This operation appends the features of two or more themes into a single theme. Attributes will be retained if they have the same name.

Theme1 Theme2 Output Theme

More about Merge

Help...   Cancel   << Back   Finish

3.3 Display the administration boundary

-Display output theme
 (Lao.shp)
-Open Theme Table

| Laos.shp |
| Lao-s.shp |
| Lao-n.shp |
| Lao-c.shp |
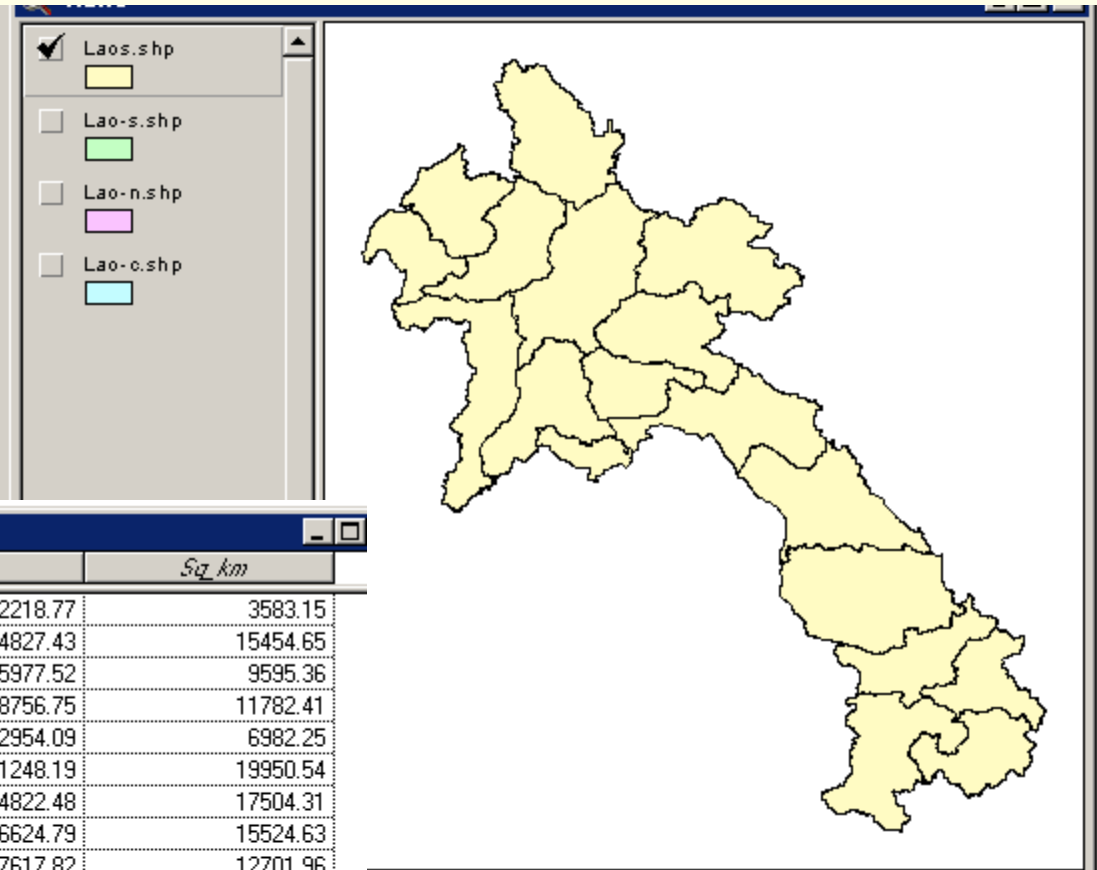
Attributes of Laos.shp

Shape	Pcode	Pname	Sq_m	Sq_km
Polygon	1	VIENTIANE MUN.	3583152218.77	3583.15
Polygon	2	PHONGSALY	15454654827.43	15454.65
Polygon	3	LUANGNAMTHA	9595355977.52	9595.36
Polygon	4	OUDOMXAY	11782408756.75	11782.41
Polygon	5	BOKEO	6982252954.09	6982.25
Polygon	6	LUANGPHRABANG	19950541248.19	19950.54
Polygon	7	HUAPHANH	17504314822.48	17504.31
Polygon	8	XAYABOURY	15524626624.79	15524.63
Polygon	9	XIENGKHUANG	12701995617.82	12701.96
Polygon	10	VIENTIANE	12578463475.03	12578.46
Polygon	11	BOLIKHAMXAY	15694835140.13	15694.84
Polygon	12	KHAMMUANE	16706856844.05	16706.86
Polygon	13	SAVANNAKHET	21378124707.83	21378.12
Polygon	14	SARAVANE	10153094263.01	10153.09
Polygon	15	SEKONG	8388072691.37	8388.07
Polygon	16	CHAMPASAK	14966441773.95	14966.44
Polygon	17	ATTAPEU	9541933838.71	9541.93
Polygon	18	XAYSOMBOUN S.R.	7701525289.21	7701.53

4.Clip

4.1 Open new view window and Add Themes

4.2 Clip buffer of road with provincial boundary

4.3 Display clipped theme

4.1 Open new view window and Add Themes

-Add road buffer theme which operated from the previous steps
(Buf_rd5km.shp)
-Add "Province.shp"
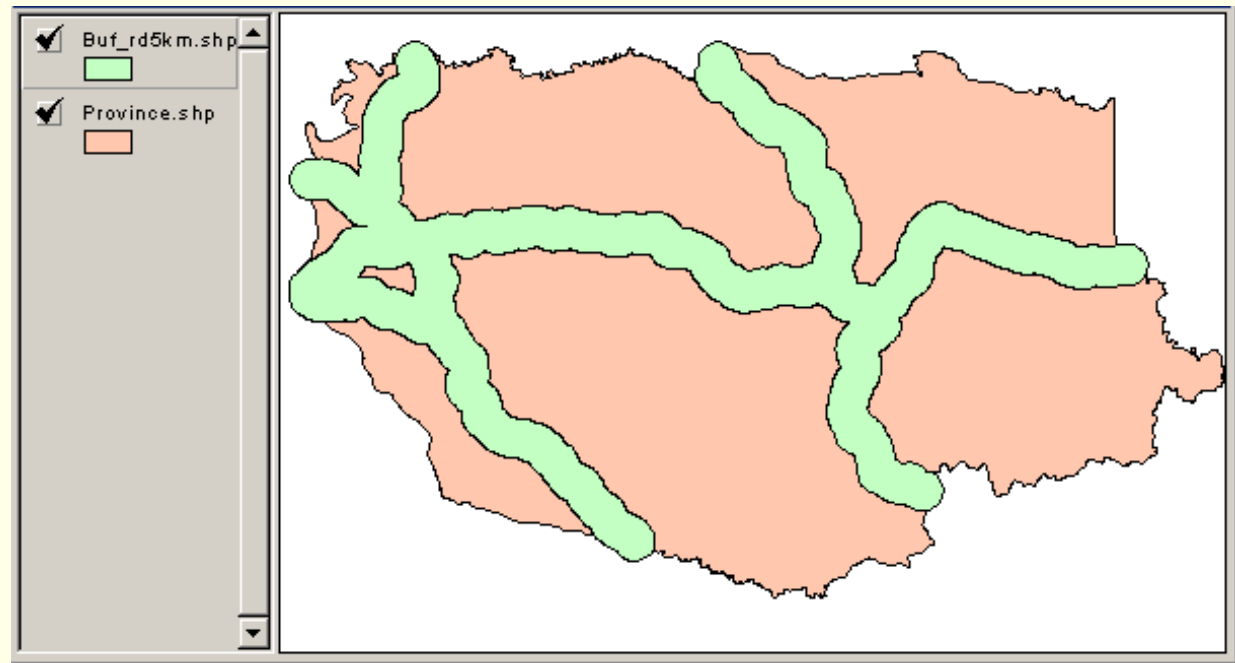
4.2 Clip buffer of road with provincial boundary

- In View menu, click
GeoProcessing Wizard
-Choose Clip one theme
based on anothers option
-Then click Next>> button
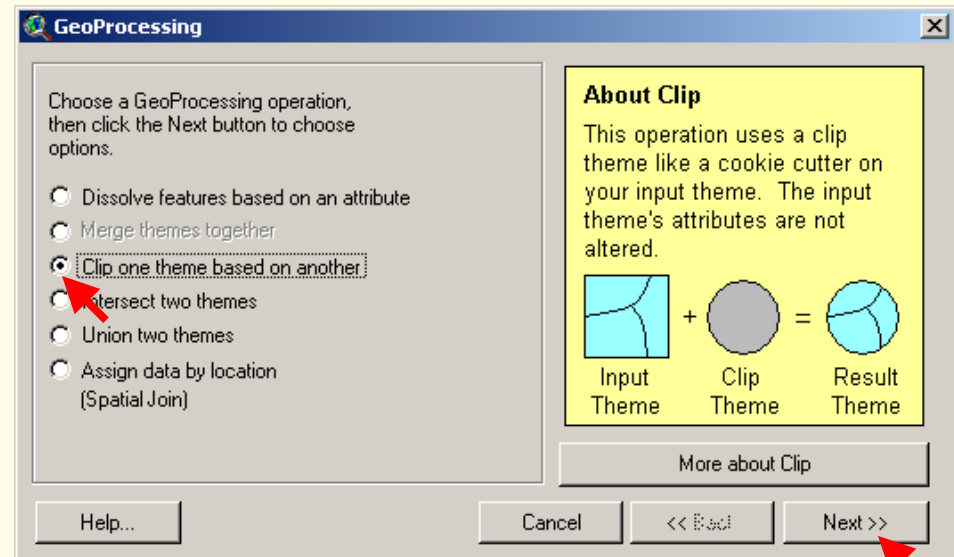
-In next window, select "Province.shp"
as input theme to clip
-Select "Buf_rd5km.shp" as a
polygon overlay theme
-Specify the output name and
directory
-Then click Finish button
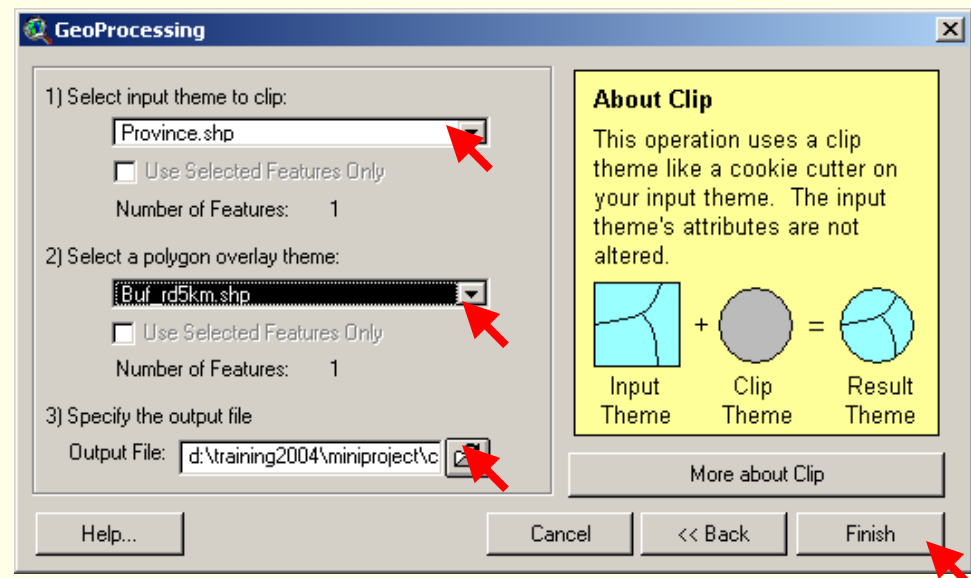
4.3 Display clipped theme

-Display output theme

(Clip_buff_rd.shp)
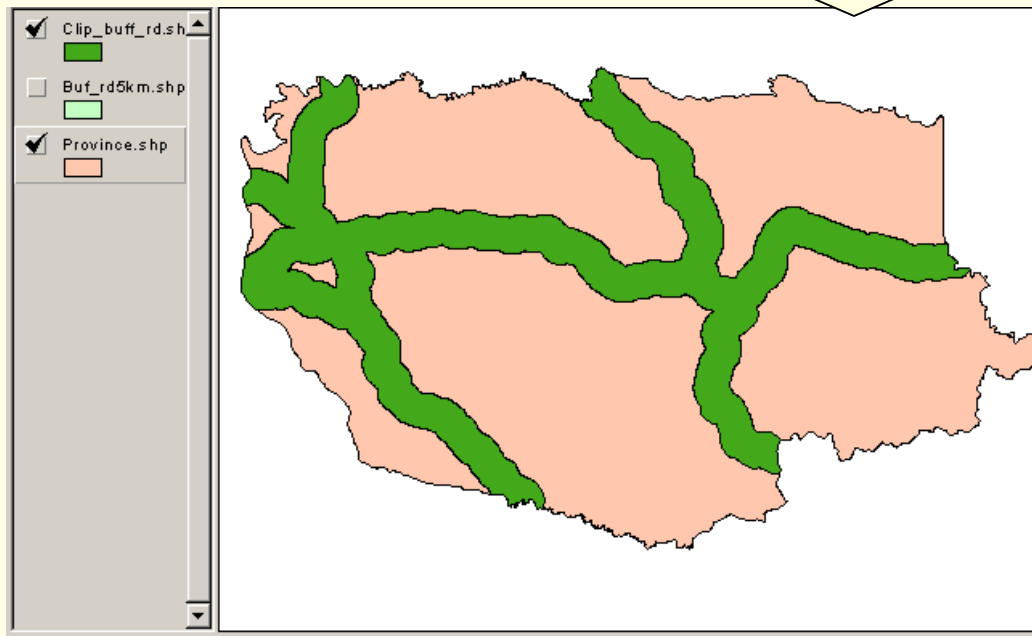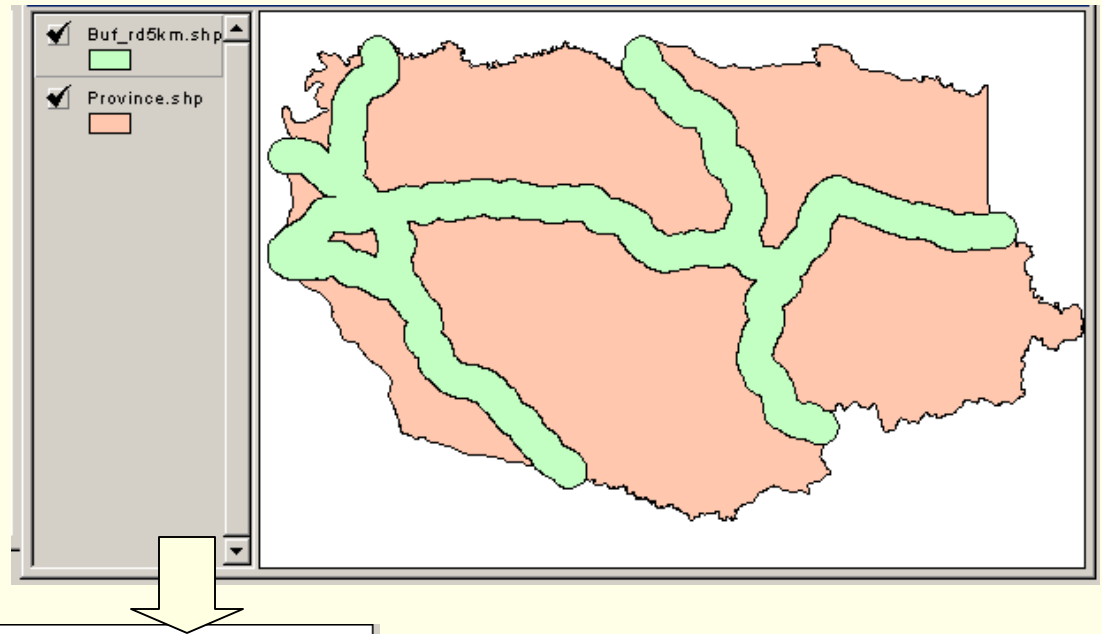
5. Intersect

5.1 Open new view window and Add Themes

5.2 Intersect buffer of road and buffer of district hospitals

5.3 Display intersected themes

5.4 Calculate new area

5.1 Open new view window and Add Themes

-Open new view window

-Add themes, "Buf_dh10km.shp" and "Buf_rd5km.shp"
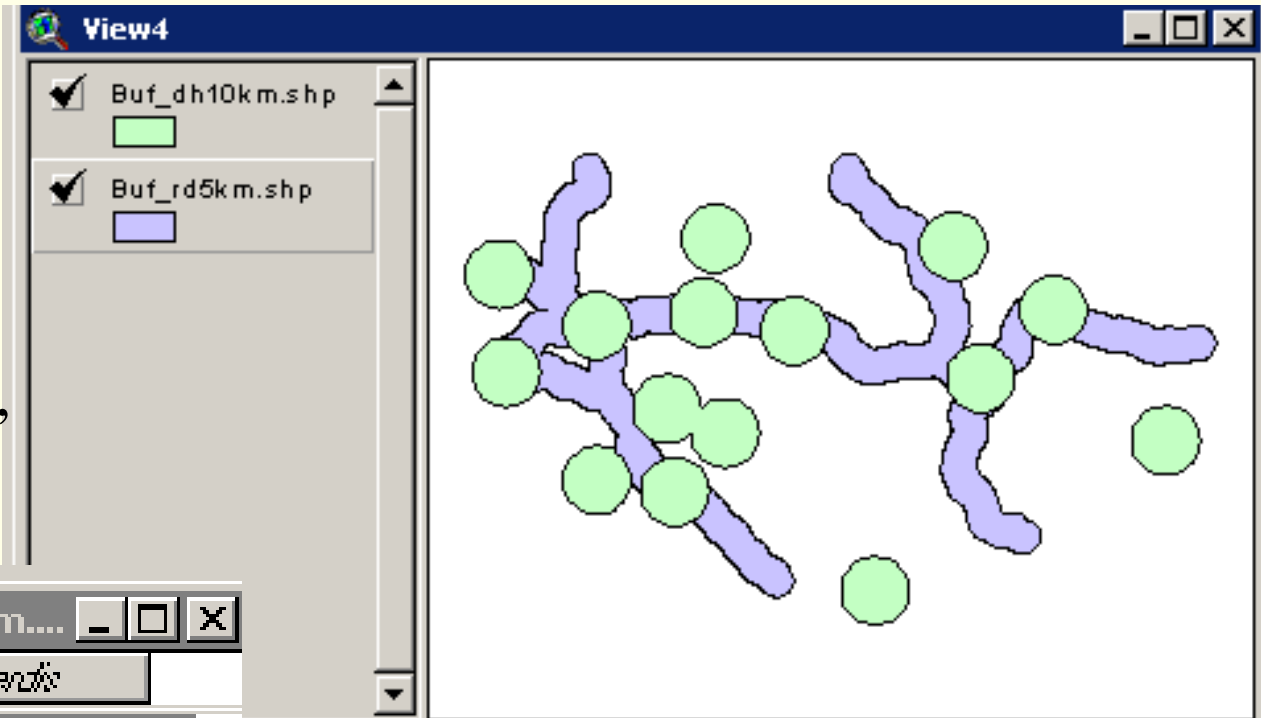
-Observe their attribute tables

5.2 Intersect buffer of road and buffer of district hospitals

- In View menu, click
GeoProcessing Wizard
- Choose Intersect two themes option
- Then click Next>> button
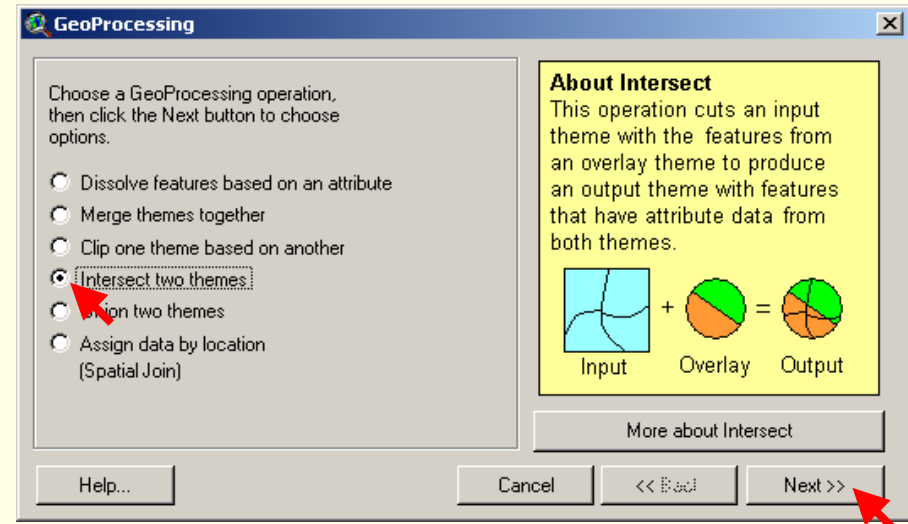
-In next window, select "Buf_rd5km.shp"
as input theme to intersect
-Select "Buf_dh10km.shp" as a
an overlay theme
-Specify the output name and
directory
-Then click Finish button
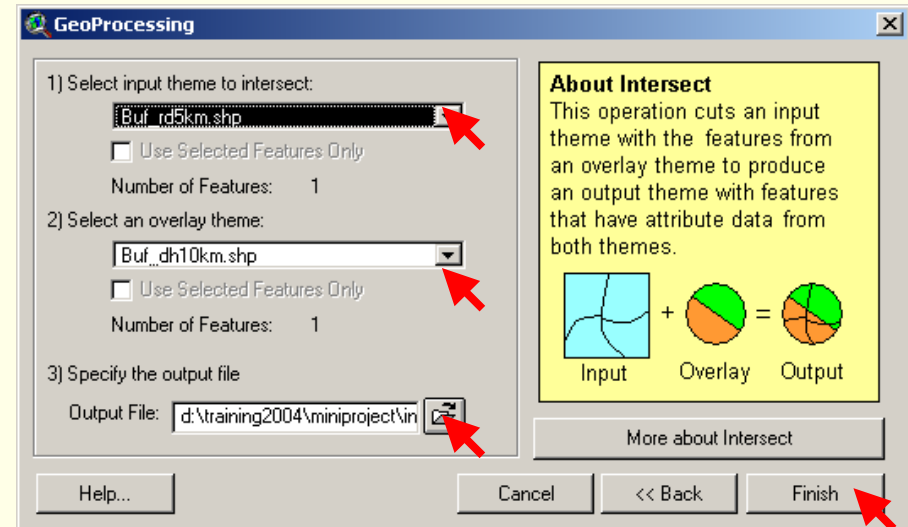
5.3 Display intersected themes

-Display output theme
(Int_buf_rd_dh.shp)

Int_buf_rd_dh.shp
Buf_dh10km.shp
Buf_rd5km.shp
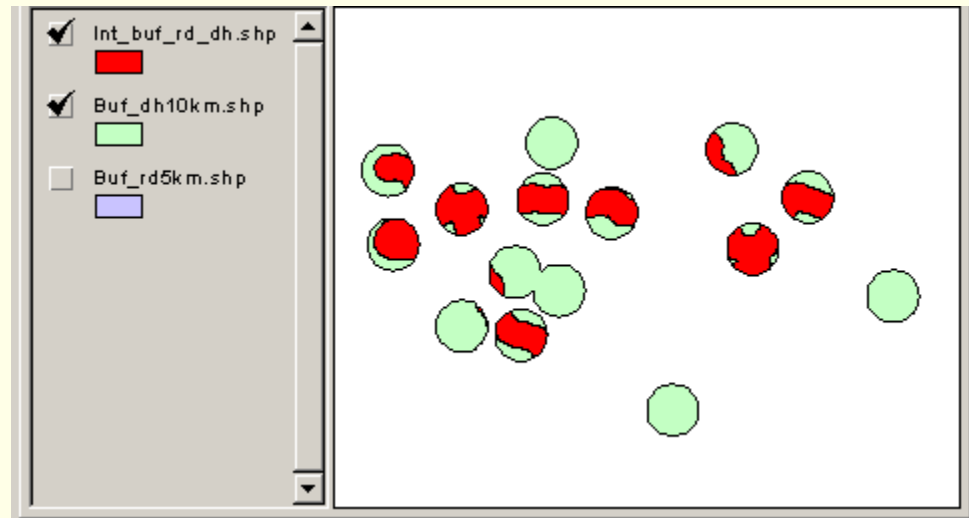
Input Theme to Intersect = buf_rd5km.shp
Overlay Theme = buf_dh10km.shp

Int_buf_rd_dh.shp
Buf_dh10km.shp
Buf_rd5km.shp
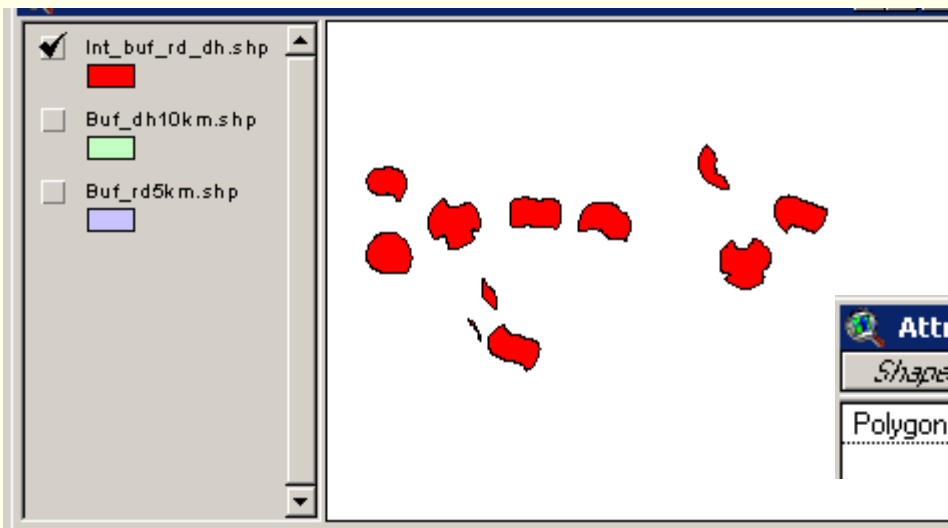
Attributes of Int_buf_rd_dh.shp

Shape	Id	Bufferdis_	Id	Bufferdis
Polygon	0	5.0000	0	10.0000

-Display output theme
(Int_buf_dh_rd.shp)
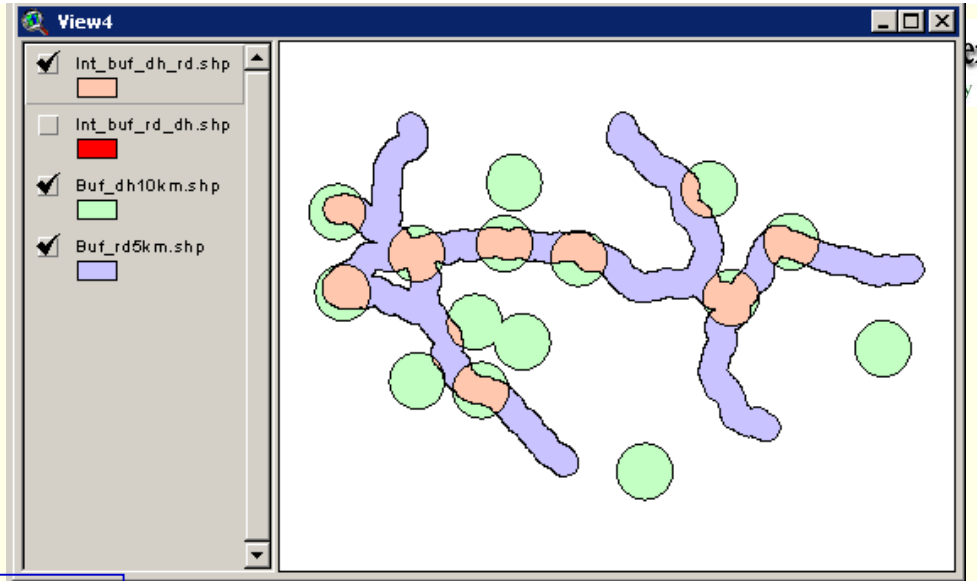
Input Theme to Intersect = buf_dh10km.shp
Overlay Theme = buf_rd5km.shp

Shape	Id	Bufferdis_	Id_	Bufferdis_	Id	Bufferdis
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000
Polygon	0	10.0000	0	5.0000	0	10.0000

5.4 Calculate new area

Due to the original data is Latitude-Longitude projection. For an accurate area unit,the data need to be projected.

-In File menu, check Projection Utility Wizard in Extensions.. sub-Menu. Click OK
-Load ArcView Projection Utility in File Menu. Ckick Next> button
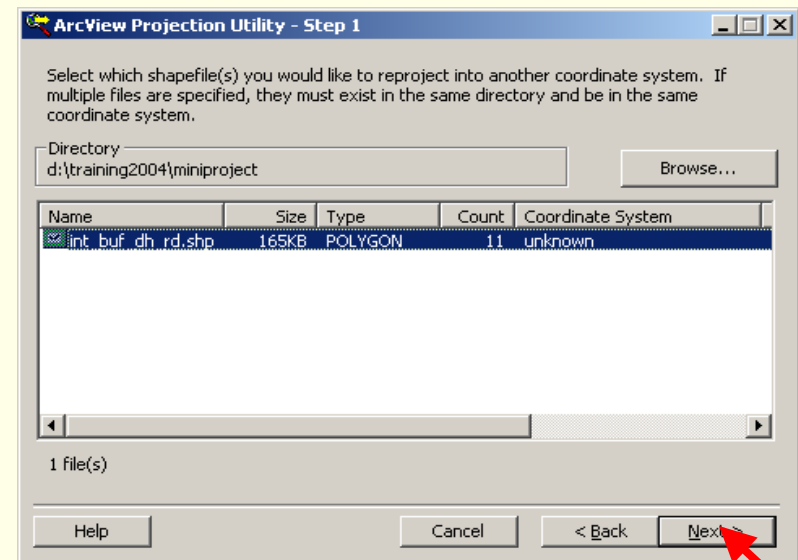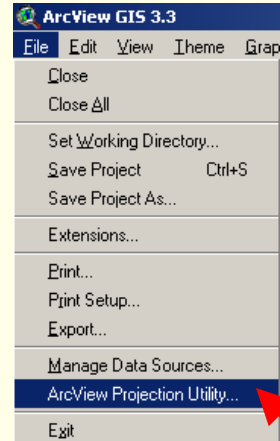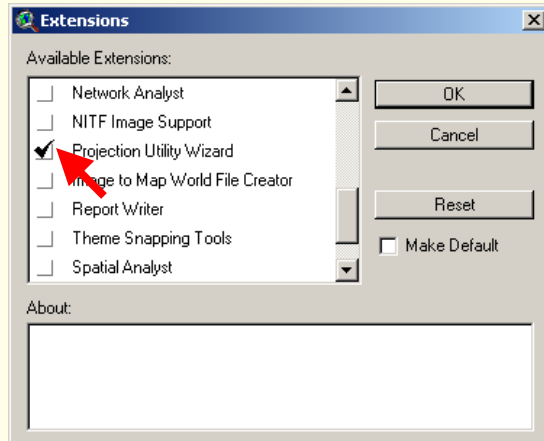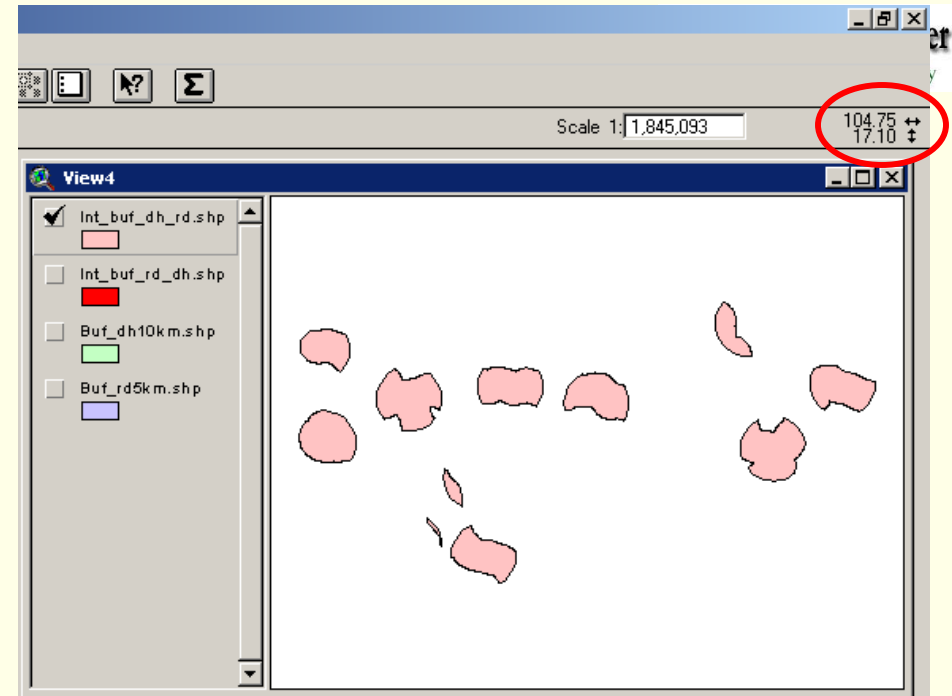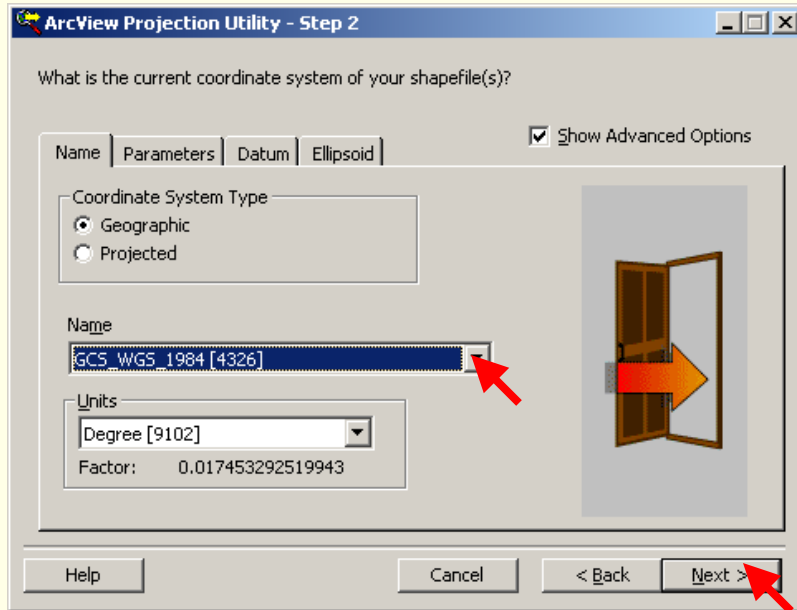
-Select GCS_WGS_1984(4326) as
The current coordinate system in Step2
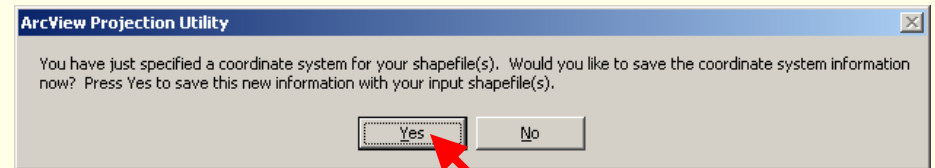
-In Step3 window, select coordinate
System Type is Projected, Name
WGS_1984_UTM_Zone_48N(32648)
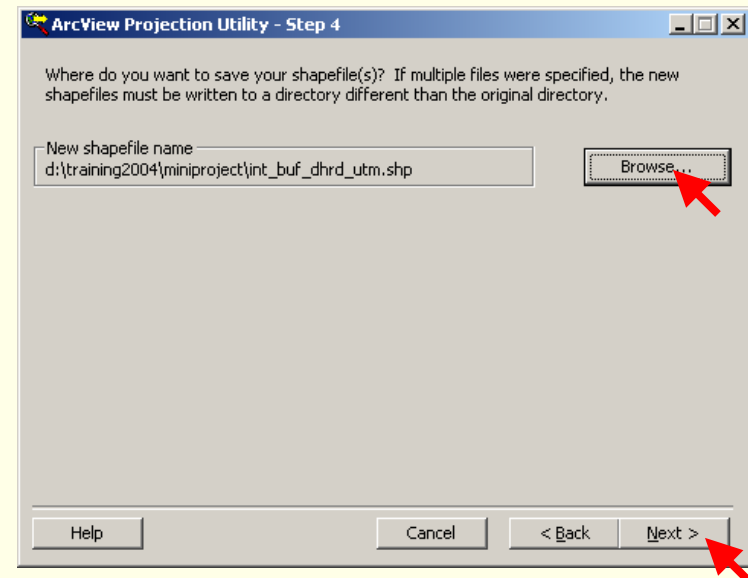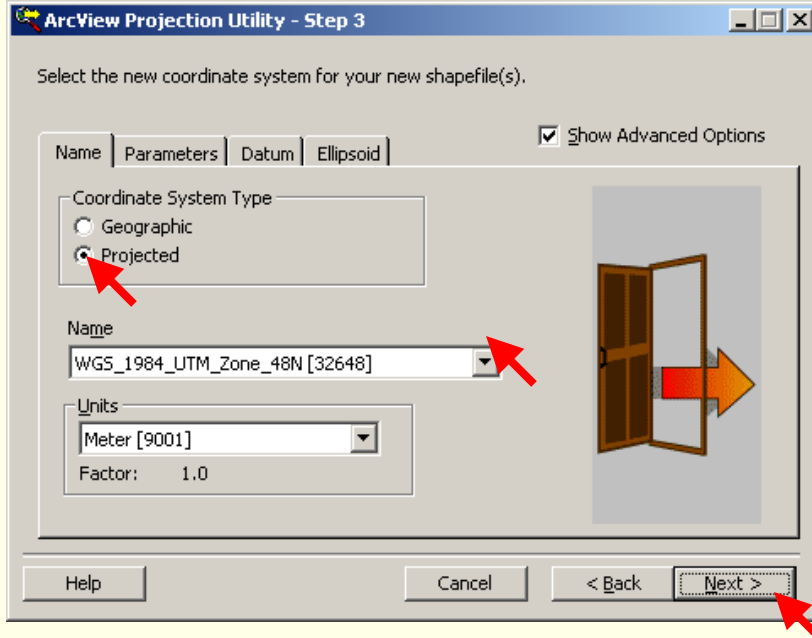
-Click Finish button in Summary Window
-Click OK button in Complete Window
-Open New Window and add Output theme
(Int_buff_dhrd_utm.shp)

ArcView Projection Utility - Summary

DWK Please verify the following settings are correct. Then, press the Finish button to begin reprojecting the listed shapefile(s).

```
Input directory and file name(s):
        d:\training2004\miniproject
                int_buf_dh_rd.shp

Input Coordinate System:
            Name:       GCS_WGS_1984
            POSC:       4326
            Unit:       Degree
            Datum:      D_WGS_1984
    Prime Meridian:     Greenwich

Input Geographic Transformation:
        none

Output Geographic Transformation:
```

| Help | Print | | Cancel | < Back | Finish |

ArcView Projection Utility - Complete

Finished processing your shapefiles.

OK

Projection Utility

Do you want to add your projected data?

Yes   No

Scale 1: 2,033,918,663   576,344.53 ↔
                              1,904,107.73 ↕

View10

☑ Int_buf_dhrd_utm.s

- Open output's attribute table
- Select Start Editing in Table menu
- Click Add Field in Edit menu, input
Field Definition then click OK

Shape	Id_	Bufferdis_	Id	Bufferdis
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000
Polygon	0	10.0000	0	10.0000

Attributes of Int_buf_dhrd_utm.shp

Field Definition

Name: Area

Type: Number

Width: 12
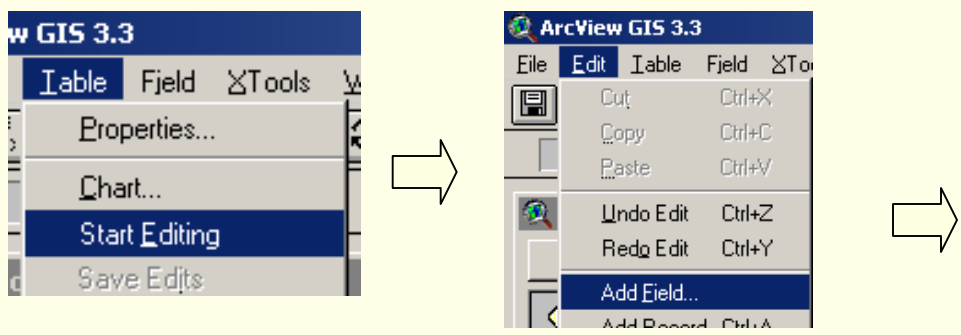
Decimal Places: 4

- Activate on new field name, click
- Input an expression to calculate area [AREA] = [Shape].returnarea

- Then Click OK

Field Calculator

Fields:
[Shape]
[Id_]
[Bufferdis_]
[Id]
[Bufferdis]
[Area]

Type:
○ Number
○ String
○ Date

Requests:
×
+
-
..
/
<
<=

[Area]

[Shape].returnarea

Shape	Id_	Bufferdis_	Id	Bufferdis	Area
Polygon	0	10.0000	0	10.0000	6843254.33
Polygon	0	10.0000	0	10.0000	194550318.91
Polygon	0	10.0000	0	10.0000	197108887.87
Polygon	0	10.0000	0	10.0000	257573567.98
Polygon	0	10.0000	0	10.0000	31654260.92
Polygon	0	10.0000	0	10.0000	136969869.60
Polygon	0	10.0000	0	10.0000	90320304.23
Polygon	0	10.0000	0	10.0000	192609536.78
Polygon	0	10.0000	0	10.0000	190435529.28
Polygon	0	10.0000	0	10.0000	253996207.05
Polygon	0	10.0000	0	10.0000	210496953.2

Attributes of Int_buf_dhrd_utm.shp

6.Union

6.1 Open new view window and Add Themes

6.2 Union buffer of road and buffer of district hospitals

6.3 Display union themes

6.4 Analyze the output

6.1 Open new view window and Add Themes

-Open new view
window
-Add themes,
"Buf_dh10km.shp"
and "Buf_rd5km.shp"
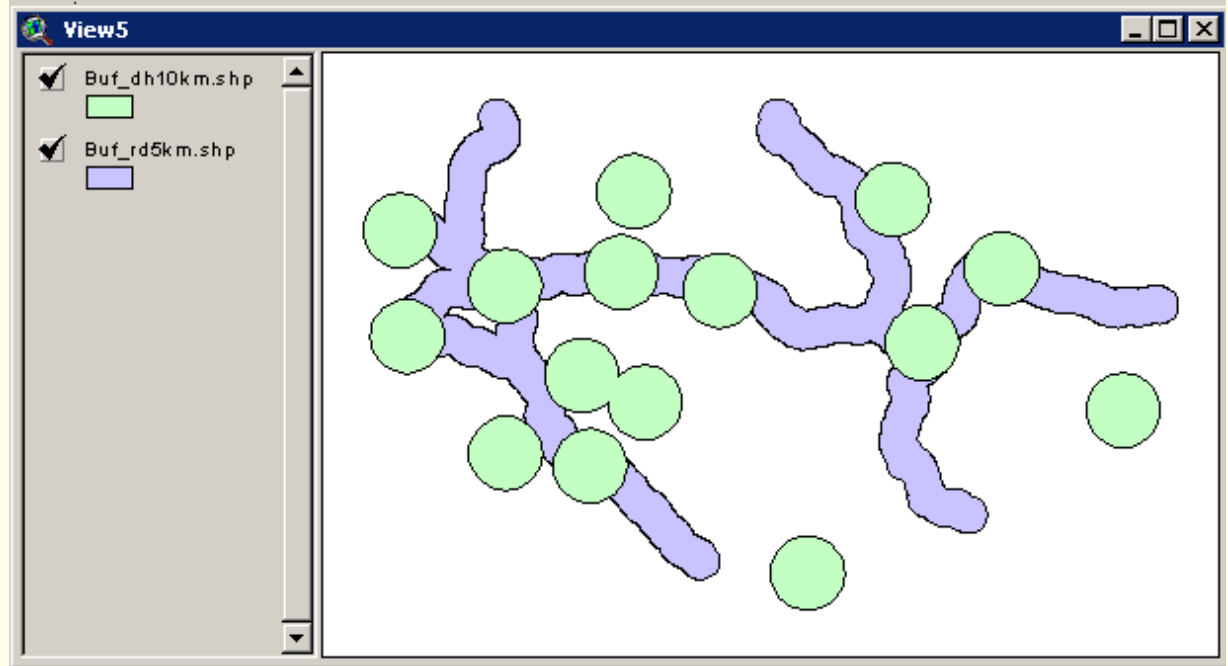
Attributes of Buf_dh10km.shp

Shape	Id	Bufferdis
Polygon	0	10.0000

Attributes of Buf_rd5km.shp

Shape	Id	Bufferdis
Polygon	0	5.0000

-Observe their attribute tables

- In View menu, click
GeoProcessing Wizard
-Choose Union two themes
option
-Then click Next>> button
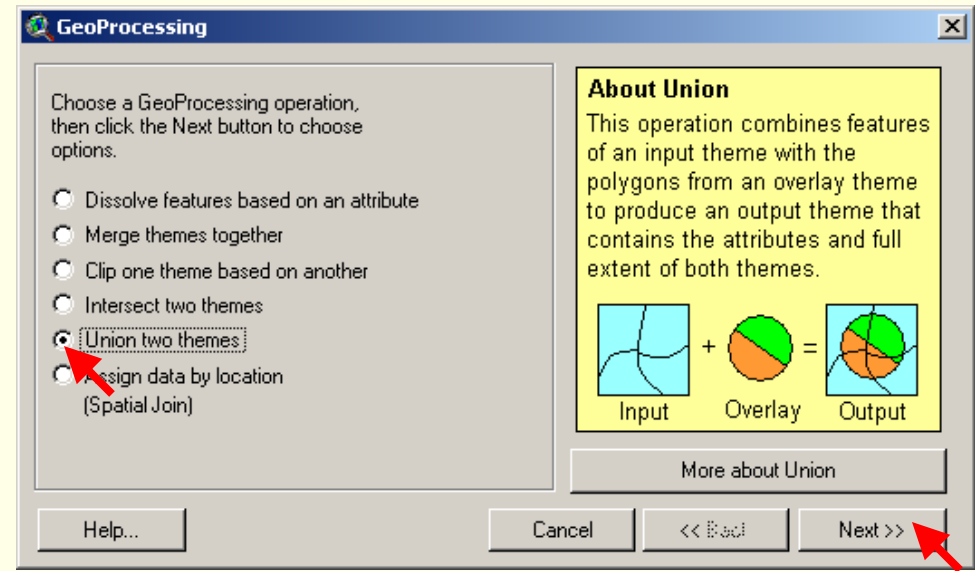
-In next window, select "Buf_rd5km.shp"
as input theme to union
-Select "Buf_dh10km.shp" as
polygon overlay theme to union
-Specify the output name and
directory
-Then click Finish button
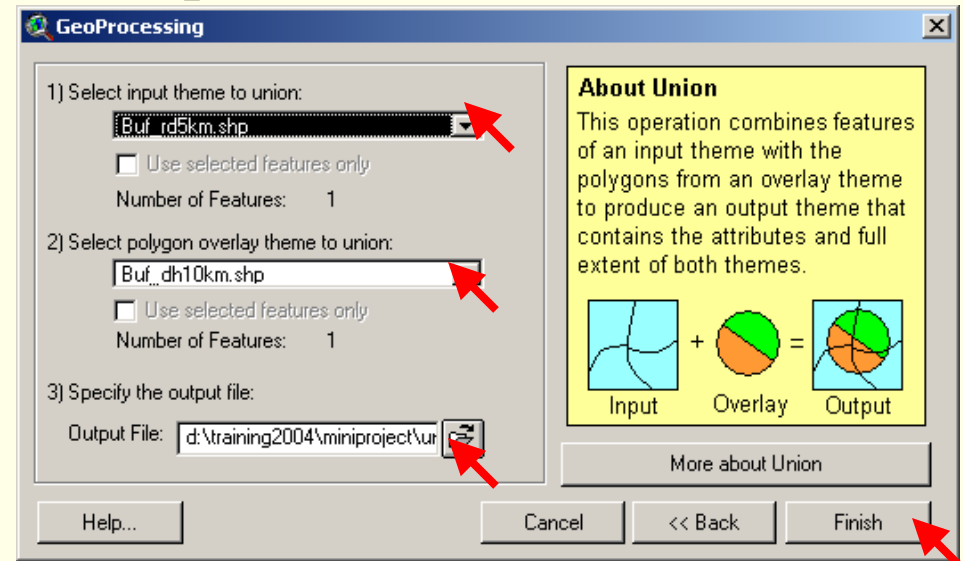
6.3 Display union themes

-Display output theme
(Un_buf_rd_dh.shp)

View5

☑ Un_buf_rd_dh.shp

☐ Buf_dh10km.shp

☐ Buf_rd5km.shp

Attributes of Un_buf_rd_dh.shp

Shape	Id_	Bufferdis_	Id	Bufferdis
Polygon	0	5.0000	0	10.0000
Polygon	0	5.0000	0	0.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000

16 Records/Polygons

6.4 Analyze the output

Case1

Case2

Inside road buffer&Inside hospital buffer

Inside road buffer&Outside hospital buffer

Case3

Attributes of Un_buf_rd_dh.shp

Shape	Id_	Bufferdis_	Id	Bufferdis
Polygon	0	5.0000	0	10.0000
Polygon	0	5.0000	0	0.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000
Polygon	0	0.0000	0	10.0000

Outside road buffer&Inside hospital buffer

-Add new field and input the result of selected areas

Table **Field** **XTools**
- Properties...
- Chart...
- **Start Editing**
- Save Edits

ArcView GIS 3.3
File **Edit** Table Field XTo
- Cut — Ctrl+X
- Copy — Ctrl+C
- Paste — Ctrl+V
- Undo Edit — Ctrl+Z
- Redo Edit — Ctrl+Y
- **Add Field...**
- Add Record — Ctrl+A

Field Definition

Name: Analysis

Type: String

Width: 50

OK

Cancel

Field Calculator

Fields
- [Shape]
- [Id_]
- [Bufferdis_]
- [Id]
- [Bufferdis]
- [Analysis]

Type
- Number
- String
- Date

Requests
- x
- +
- -
- ..
- /
- <
- <=

[Analysis] =

"Inside DH servicable area but outside road buffer"

OK

Cancel

ew GIS 3.3
dit Table Field XTools Window Help

14 of 16 selected

Attributes of Un_buf_rd_dh.shp

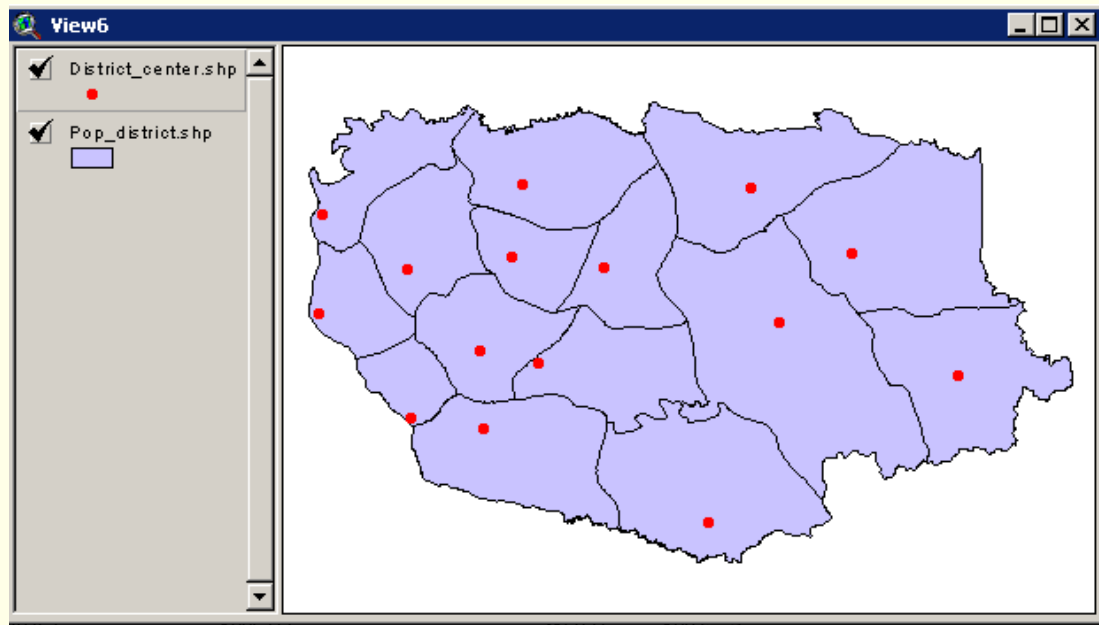| Shape	Id_	Bufferdis_	Id	Bufferdis	Analysis
Polygon	0	5.0000	0	0.0000	
Polygon	0	5.0000	0	10.0000	
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer
Polygon	0	0.0000	0	10.0000	Inside DH servicable area but outside road buffer

7. Spatial Join

7.1 Open new view window and Add Themes

7.2 Join attribute table to district centers

7.3 Display spatial joined table

7.1 Open new view window and Add Themes

-Open new view window
-Add themes,
"District_center.shp"
and "Pop_district.shp"

View6

District_center.shp

Pop_district.shp

Attributes of District_center.s...

Shape	Pcode	Pname
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET
Point	13	SAVANNAKHET

Attributes of Pop_district.shp

Shape	Area	Pcode	Pname	Dcode	Dname	Total95	No_village
Polygon	1765.107	13	SAVANNAKHET	1312	Vilabouri	24238	119
Polygon	895.946	13	SAVANNAKHET	1311	Xaibouri	47073	86
Polygon	1452.316	13	SAVANNAKHET	1313	Atsaphon	40290	94
Polygon	2266.782	13	SAVANNAKHET	1305	Xepon	41537	160
Polygon	1082.417	13	SAVANNAKHET	1302	Outhoumphon	75080	109
Polygon	998.077	13	SAVANNAKHET	1315	Phalanxai	22761	73
Polygon	700.938	13	SAVANNAKHET	1303	Atsaphangthong	25640	49
Polygon	3372.125	13	SAVANNAKHET	1304	Phin	39513	146
Polygon	681.611	13	SAVANNAKHET	1301	Khanthabouri	74352	96
Polygon	1049.759	13	SAVANNAKHET	1309	Champhon	87719	166
Polygon	1700.596	13	SAVANNAKHET	1306	Nong	16745	99
Polygon	1205.960	13	SAVANNAKHET	1310	Xonbouri	34167	97
Polygon	454.823	13	SAVANNAKHET	1314	Xaiphouthong	26831	41
Polygon	1635.817	13	SAVANNAKHET	1308	Songkhon	85373	162
Polygon	2115.852	13	SAVANNAKHET	1307	Thapangthong	23330	84

7.2 Join attribute table to district centers

- In View menu, click
GeoProcessing Wizard
-Choose Assign data by
location
-Then click Next>> button
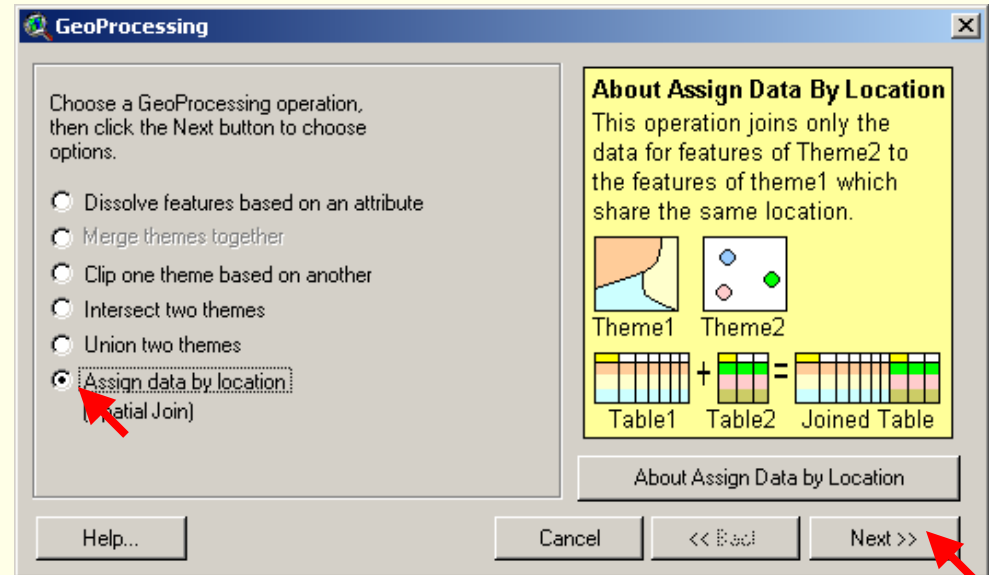
-In next window, select "District_center.shp"
as a theme to assign data
-Select "Pop_district.shp" as
a theme to assign data from
-Then click Finish button

7.3 Display spatial joined table

Geoinformatics Center
Asian Institute of Technology
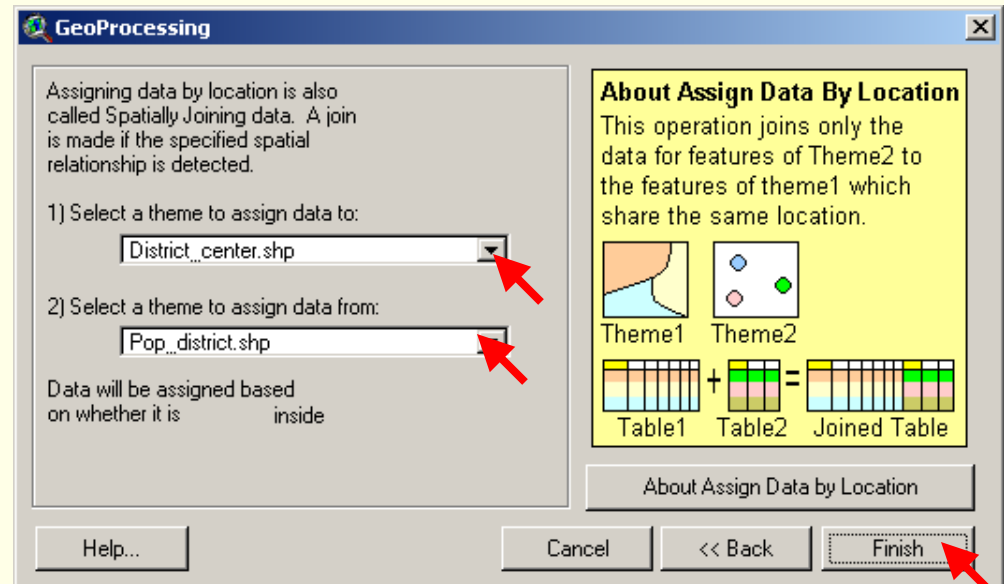
-Open attribute table of "District_center.shp"

-To delete join table,

Select Remove All

Joins in Tables

Menu.

Attributes of District_center.shp

Shape	Pcode	Pname	Area	Pcode	Pname	Dcode	Dname	Total95	No_village
Point	13	SAVANNAKHET	1765.107	13	SAVANNAKHET	1312	Vilabouri	24298	119
Point	13	SAVANNAKHET	3372.125	13	SAVANNAKHET	1304	Phin	39513	146
Point	13	SAVANNAKHET	2266.782	13	SAVANNAKHET	1305	Xepon	41537	160
Point	13	SAVANNAKHET	1635.817	13	SAVANNAKHET	1308	Songkhon	85373	162
Point	13	SAVANNAKHET	700.938	13	SAVANNAKHET	1303	Atsaphangthong	25640	49
Point	13	SAVANNAKHET	998.077	13	SAVANNAKHET	1315	Phalanxai	22761	73
Point	13	SAVANNAKHET	1700.596	13	SAVANNAKHET	1306	Nong	16745	99
Point	13	SAVANNAKHET	1082.417	13	SAVANNAKHET	1302	Outhoumphon	75080	109
Point	13	SAVANNAKHET	1452.316	13	SAVANNAKHET	1313	Atsaphon	40290	94
Point	13	SAVANNAKHET	1049.759	13	SAVANNAKHET	1309	Champhon	87719	166
Point	13	SAVANNAKHET	2115.852	13	SAVANNAKHET	1307	Thapangthong	23330	84
Point	13	SAVANNAKHET	1205.960	13	SAVANNAKHET	1310	Xonbouri	34167	97
Point	13	SAVANNAKHET	895.946	13	SAVANNAKHET	1311	Xaibouri	47073	86
Point	13	SAVANNAKHET	454.823	13	SAVANNAKHET	1314	Xaiphouthong	26831	41
Point	13	SAVANNAKHET	681.611	13	SAVANNAKHET	1301	Khanthabouri	74352	96

Population 1995
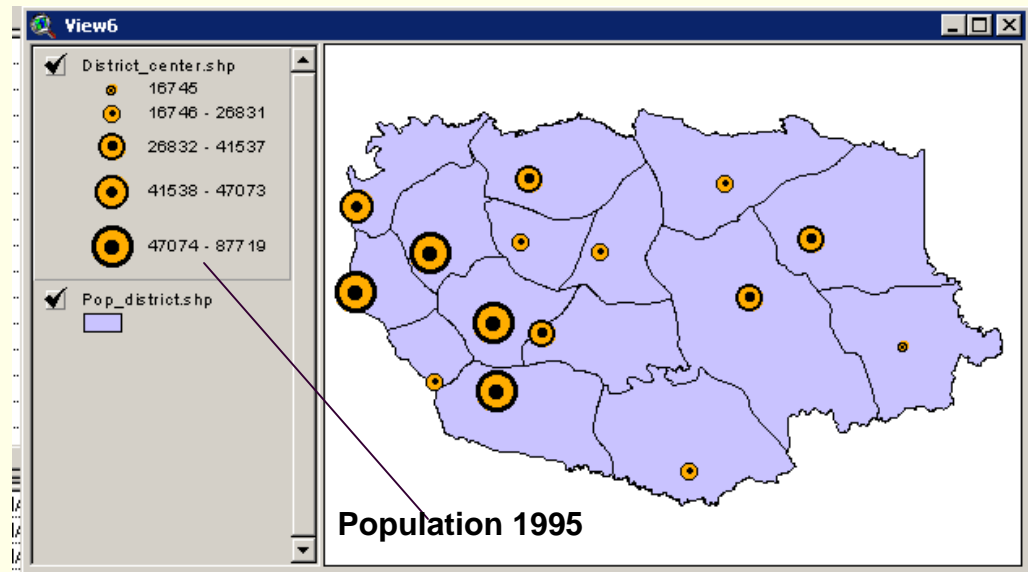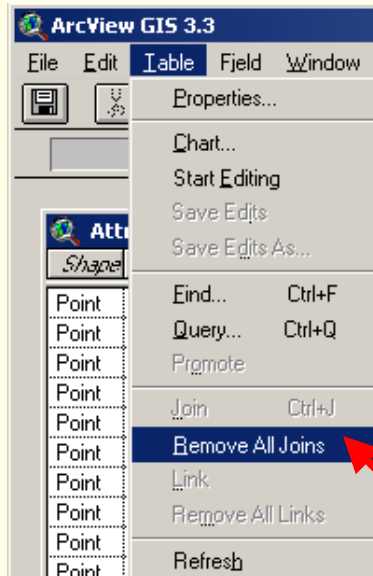
Case Study

Finding the suitable location for a new hospital

Criteria

1. Not away from road than 1 Km

2. Away from existing hospitals than 1.5 Km.

3. Landuse are not water bodies, forest