Lab 2: Data Collection and Digitization

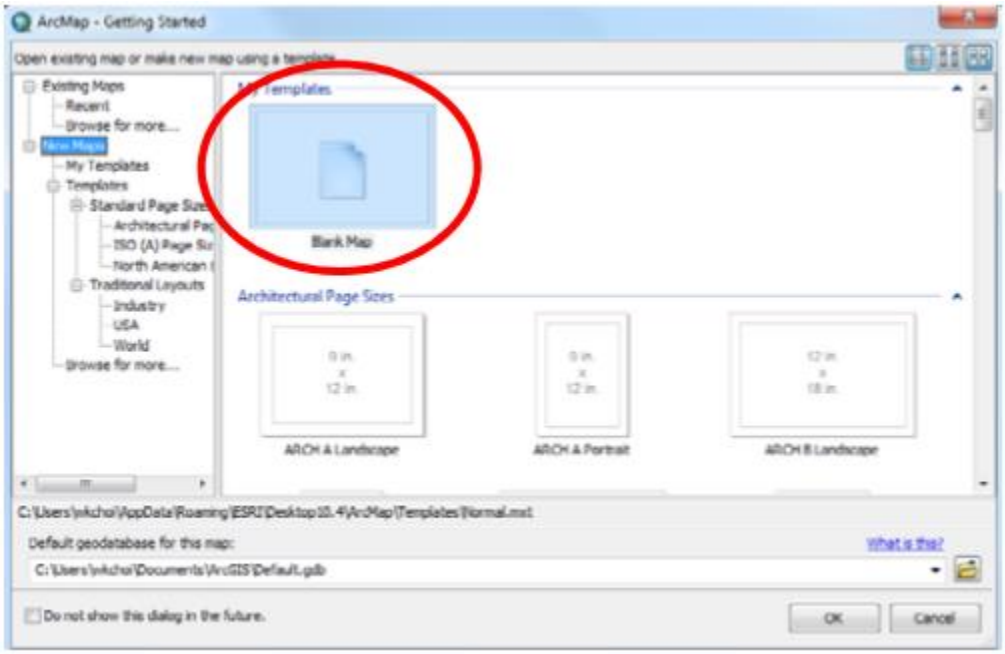
This lab is designed for student to practice on manual digitization of a simple map and some basic skills in map compilation. Students will use the data collected from field work to make the map of study area.

After finishing the lab works, students should learn to:

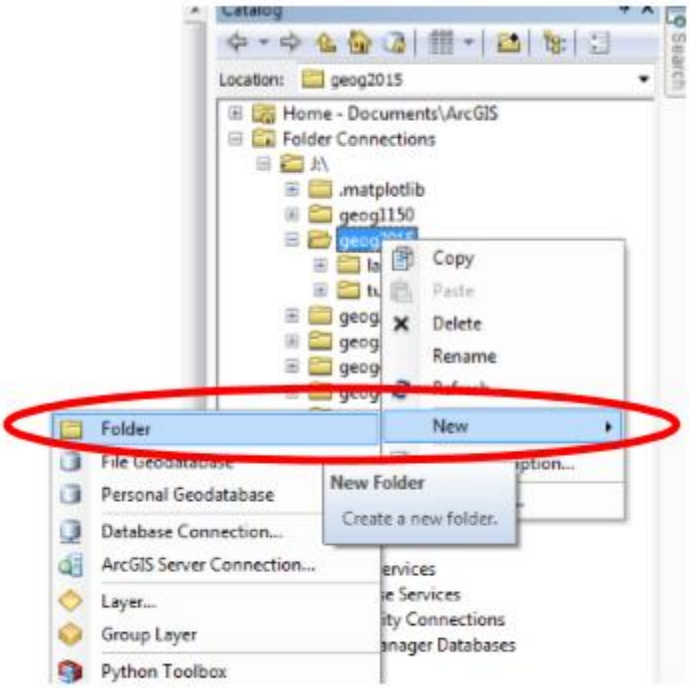
- construct new feature class in ArcCatalog;
- create feature class using XY table;
- use ArcMap digitization functions;
- create features by using distance and direction measured on field;
- symbolize features using proportional symbols**;**

Note:(You will use the data collected during field survey to conduct this lab, make them ready before you start!)

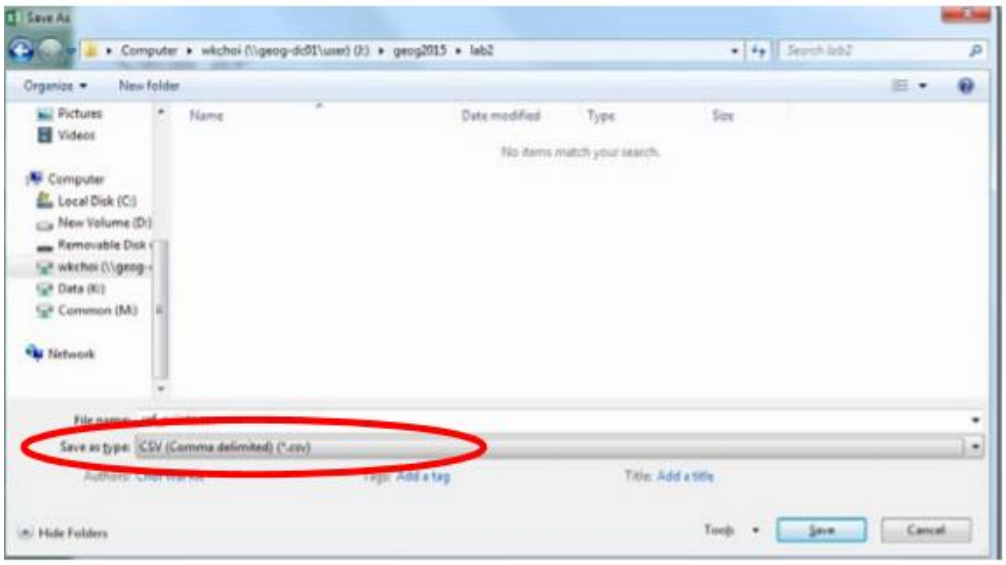
1. Start ArcMap (press the Windows Start button > All Programs > ArcGIS > ArcMap 10.4). Create a Blank Map using My Templates.



2. Select Windows > Catalog to open the Catalog Window in Map Document (on the right hand side of the view).
3. In the Catalog Window, navigate to Folder Connections > E:\niraj\lab\Labdata. Right-click it and select New > Folder to create a new folder. Name it lab2.



4. Start Microsoft Excel.
   Create a worksheet with four columns:
   Name, Ground Easting, Ground Northing, Code
   Enter the coordinates (in UTM) .
5. Save the worksheet as .csv and place it in E:\lab\lab2. Set the Save as type to be CSV (Comma delimited). Click [Save] button to save it. Click [OK] then [Yes] to confirm saving it in this format.



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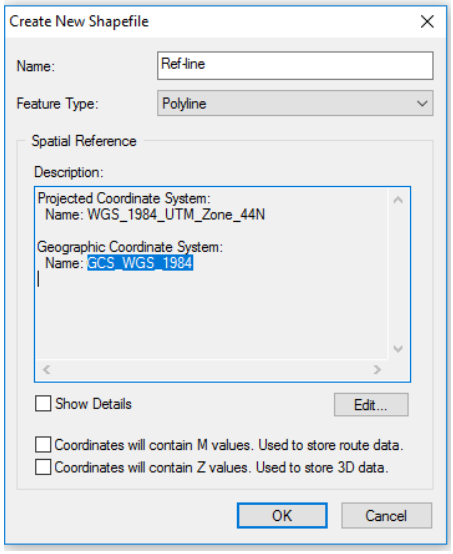
Then Exit Microsoft Excel (choose [Don't Save] this time).

6. Return to ArcMap.
   In the Catalog Window, right-click E:\lab\lab2 folder, select New > Shapefile…

   Set the properties of the shapefile as below :
   - Name: Boundary wall
   - Feature Type: Polyline
   - Spatial Description: **Projected Coordinate System**: WGS_1984_UTM_Zone_44N
     Geographic Coordinate System: GCS_WGS_1984

   (Set by clicking [Edit] button, in the Spatial Reference Properties dialog box, choose Projected Coordinate Systems > UTM > Northern Hemisphere > WGS_1984_UTM_zone_44N. Click [OK] to accept)



   Then click [OK] to create this shapefile.

   Note:The UTM system divides the Earth into 60 zones, each 6° of longitude in width. You may use the interactive map in the following website to check which UTM zone a particular location belongs to:

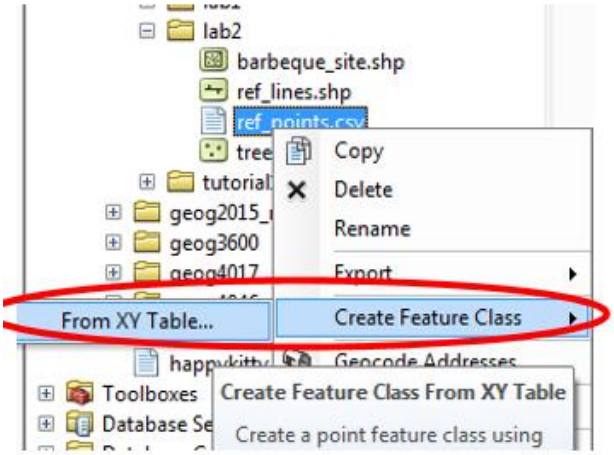
   http://whatutmzoneamiin.blogspot.hk/p/map.html

7. **Repeat step 7 to create two more shapefile as below:**
   Name: trees
   Feature Type: Point
   Spatial Description: (same as ref_lines)

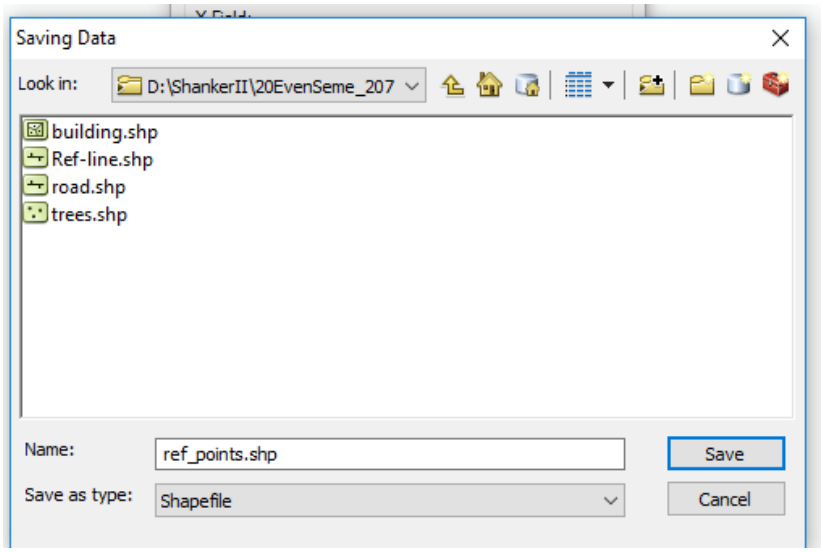
   Name:building
   Feature Type: Polygon
   Spatial Description: (same as ref_lines)

Name: road
Feature Type: Polyline
Spatial Description: (same as ref_lines)

8. In the Catalog Window, right click lab2.csv (in your folder) and select Create Feature Class > From XY Table….



Set the properties of the feature class as below
X Field:Easting
Y Field:Northing
Coordinates System of Input Coordinates:(same as boundry wall) (Click the [Coordinate System of Input Coordinates…] button to set). Specify output shapefile of feature class: lab2.shp (In the Saving Data dialog box, you need to change the Save as type to be Shapefile, then click the [Save] button.)
(Leave other fields as default)

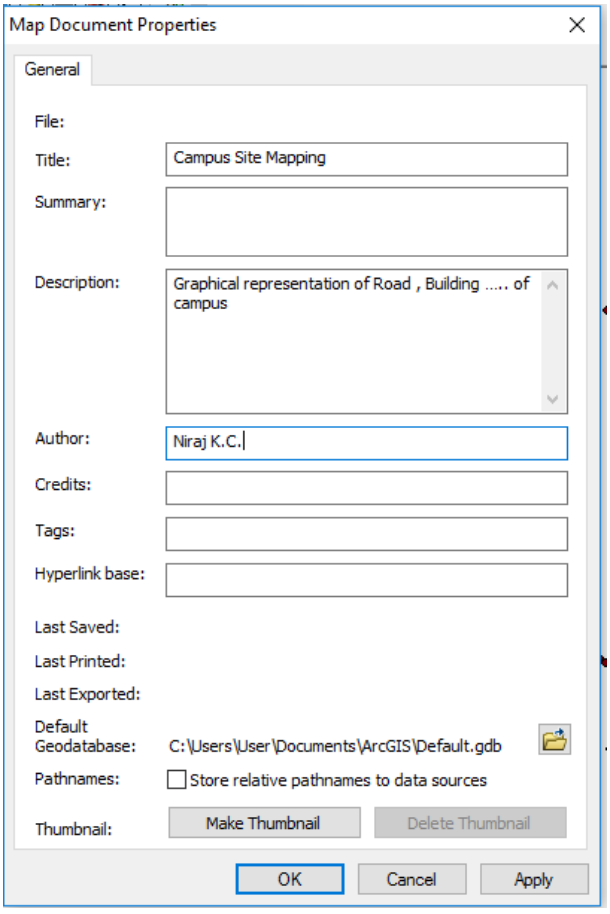


9. You may see the newly created features i.e. trees, boundry wall, building…… have been added into Data Frame as layers.
   Question: Why nothing is displayed in our Data Frame now?

10. Drag the lab2.shp from the Catalog Window and drop it on the view to add it as a layer in Data Frame. Alternatively, you may use Add Data (File > Add Data > Add Data…) to add it into Data Frame.
    Question: What is the current display scale?

    (Hint: check the Standard toolbar)

11. Change the properties of Map Document (File > Map Document Properties…) as below:
    Title:Lab 2 :Campus Site Mapping
    Description: Graphical representation of Road , Building ….. of campus
    Author: (your name)



Click Apply and then ok

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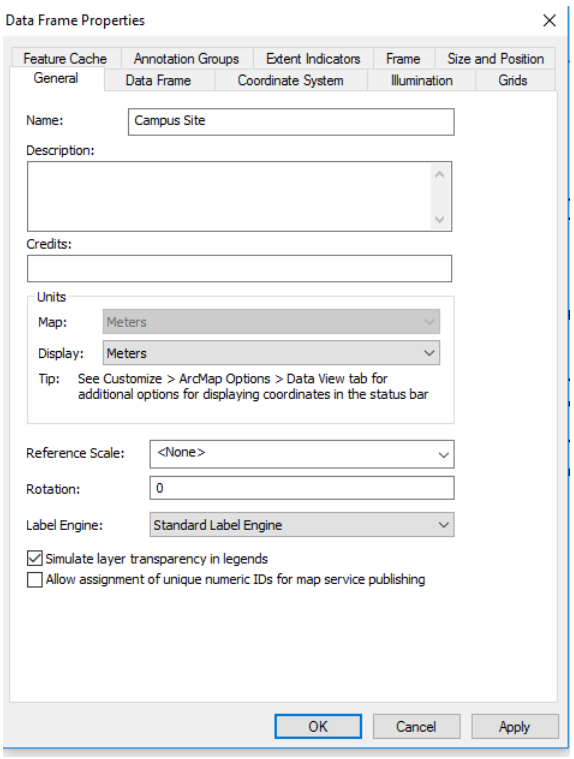
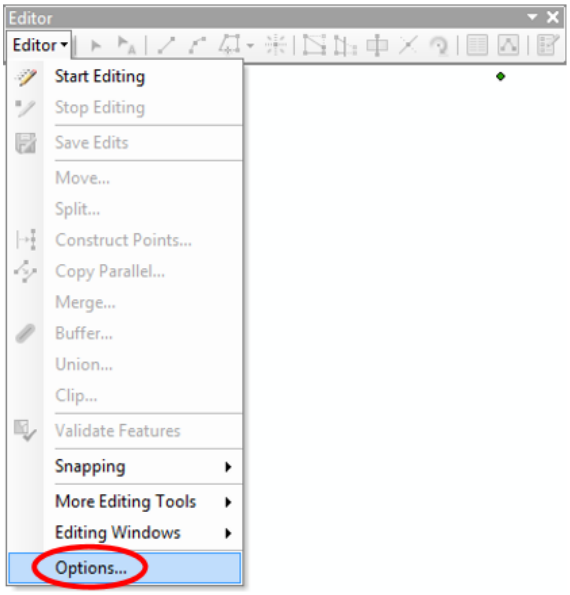
Moreover, set the properties of Data Frame (View > Data Frame Properties…) as below: (in [General] tab) **Name: Campus Site (Units) Display: Meters**



Click Apply and the OK

12. Save the Map Document at this stage. Save it (File > Save) as Lab2.mxd and place it in your subfolder.
13. Turn on the Editor toolbar (Customize > Toolbars > (tick)Editor). Click the [Editor] button on the Editor toolbar and select Options….



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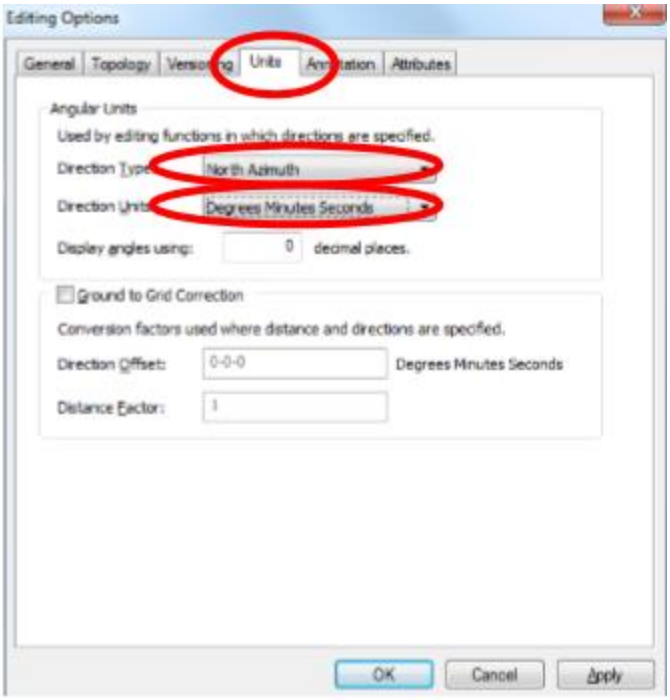
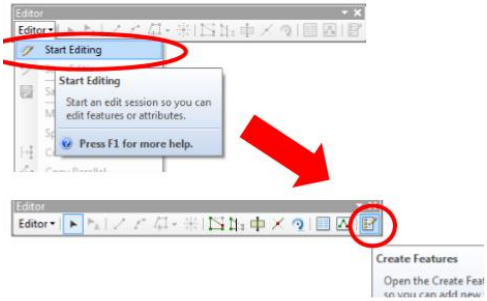
14. In the [Units] tab, set the Direction Type to be North Azimuth, and Direction Units to be Degrees Minutes Seconds (both in Angular Units). Click [OK] to accept.



Digitization :

15. Change the display scale to be 1:2000 (type on the Map Scale field in Standard toolbar).

16. In the Table Of Contents, rightclick LAb2 layer and select Label Features, so you may distinguish the points on your map.
17. Drag all layers from arc catalog to Arc Map Table of Content.
    Click the [Editor] button on Editor toolbar again. Select Start Editing.
    Then press the Create Features button to turn on the Create Features Window (on the right ha nd side of the view).



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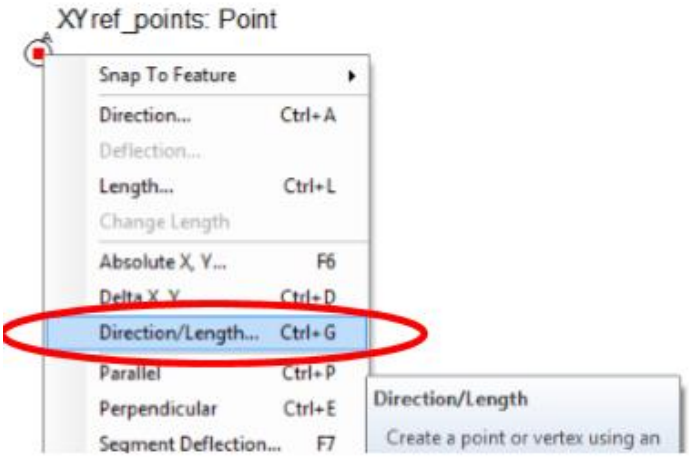
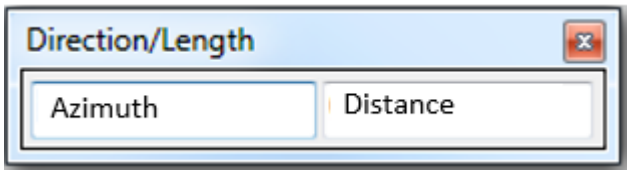
Important steps to be followed while preparing map from XY table:

If you have collected azimuth/ direction and distance, you can directly plot the required point from collected azimuth/ direction of reference point and distance from reference point to required point.

Move the cursor over Reference Point. A red square appears which indicate the start point of the reference line. (Move the cursor away from reference point but do NOT click elsewhere) Right-click and select Direction/Length….



Type the (Azimuth from Reference Point to requiredPoint) and 200 into the Direction/Length dialog box. Then press [Enter] key on your keyboard.



- Beware that the format of azimuth should be ddd-mm-ss, use hyphen as the separator.
- The unit of length here is meter.
- Right-click and select Finish Sketch to finish.
- Snapping should be on as per requirement.

Assisgnment:

A. **Find and practice different editor tool that are seen in editor Ribbon and also find advance editing tools seen inside editor toolbar and practice and generate your conclusion graphically in your Lab Report.**

   <u>If there is any problem in finding and using editing tools, Go to ArcGIS Desktop Help and search your problem.</u>

B. Degitize all the assigned layers with editor tools.

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C. Finally prepare a Campus Site Map with proper Symbols proportion, Title, Legend , Scale Bar, Text, Northarrow, Neatline etc whatever you done in Lab 1.

Points to be Remember:

- **Map should be informative.**
- **Properly Place Map Design Elements.**
- **Geographic and projected coordinate should be uniform for all layers.**
- **Perfect symbol must be given to the layers.**
- **Symbol size and color should be properly balanced.**
- **Scale should be in KM placed in Bottom Middle of the page**
- **Title should be in Top Middle of The page.**
- **North arrow should be in Right Top corner of the page but should not above the border line of the main content.**
- **Legend should be in Bottom Left corner.**
- **Place text if it is necessary like author, date, any remarkable content of map etc.**
- **Use matching background color/ Color combination should be properly matched.**
- **Scale should be fix at 1:2000.**
- **Fix different kinds of digitization error i.e. undershoot, overshoot, gaps, duplication etc.**
- **Page setup should be done as per your convenience.**

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