***Task 1***

Q1

Since the shape files are supported by various GIS software, so we still use this file type.

Limitation:

Shapefiles don’t support names in fields longer than 10 characters and raster files.

Q2

we can use a spatial index for indexing geo-objects - shapes. The spatial index makes it possible to efficiently search for objects that overlap in space.

Q3

EPSG:28355 means the projected system and it projects the coordinate system onto a square.

This projection is called Spherical Mercator projection.

Q4

Geodatabases

Geodatabases allow users to thematically organize their data and store spatial databases, tables, and raster datasets.  There are two types: File Geodatabase and Personal Geodatabase.

***Task 2***

Q5

Wy-Yung

Q6

Koonika

Q7

Since the shapefiles don’t support names in fields longer than 10 characters.

***Task 3***

Q8

This is the coordinate difference, X\_CHK/Y\_CHK is calculated from the geometry through the field calculator, while X\_COORD/Y\_COORD is the static variables that came with the shapefile.

Q9

Australia

Q10

The transformation of the coordinate.

Q11

We should keep the projection consistent across all study areas.

Q12

X axis

Q13

The variable f is corresponding to the feature of the layer.

***Task 4***

Q14

Database format: .gpkg

Q15

(1)

distance(): Calculate the direct distance between two points.

point\_line\_distance(): Calcualte the distance from point to the line given by the start point and end point.

rdp(): Simplifies a given array of points based on the threshold(epsilon).

(2)

It’s the Ramer-Douglas-Peucker algorithm.

This algorithm is to reduce the number of points in a curve that is approximated by a series of points.

(3)

It is used to execute some code only if the file was run directly, and not imported.