**Hexagons fields and file formats**

***Basic sequence***

Visio is used to determine the size of the hexagons and their placement. Within the Visio environment, the hexagons are assigned a name and an abbreviation. Collectively, the following fields of information are available:

|  |  |
| --- | --- |
| Field Name | Description |
| name | The name of the polygon. Example *“Gisborne RTO”* |
| name\_abbr | The abbreviation of the name. Example *“GIS”* These are all in upper case. |
| x\_centre | The x coordinate of the polygon’s centre. |
| y\_centre | The y coordinate of the polygon’s centre. |
| height | The height between the hexagon’s two horizontals. This value will be the same of each data row. |
| value | This is a value for the particular polygon. It is useful for testing ***and will be discarded eventually***. |

***Creation of hexagon vertices***

The function ***fnCalculateHexCoords(x\_centre, y\_centre, height)*** returns a 6 x 2 matrix of hexagon vertices. A hexagon has 6 vertices (i.e. these are presented as rows) and a pair of numbers ( X coordinate and Y coordinate) for each row. These x and y coordinates are presented as columns.

***Creation of geom\_polygon object***

Basically, this operation will read through each row of a csv file. And then for each row of this CSV file, it will expand the row into 6 rows – one for each point. It will add two columns: x and y coordinates for each of the six vertices.

For example, in regards to RTO (31 polygons) we start off with a 31 x 6 data frame (for details of the columns, see the table above). We append two additional columns (we now have 8 columns) and expand each row 6 times. So, the result should be a 186 x 8 structure.