GIS 3 Lab 1

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This lab is aimed to practice R installation and some introductory materials of the course.

1. R Version

First, we check the R version installed.

```
## [1] "R version 3.6.3 (2020-02-29)"
```

As we can see, our R version is 3.6.3.

Next up, we will see some basic GIS examples achievable in R.

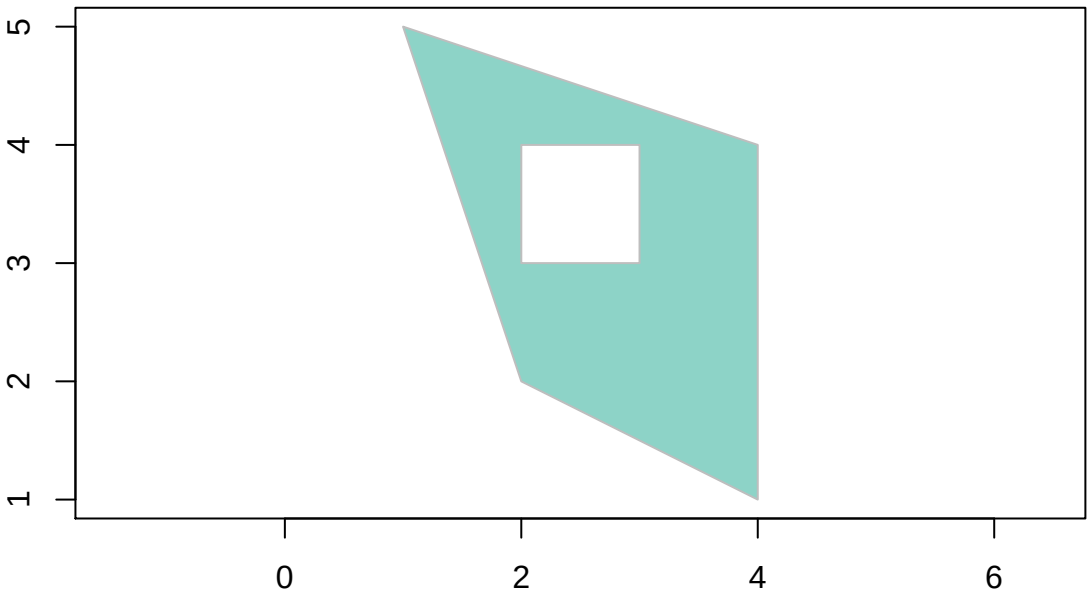
2. Simple Feature Geometries

The **sf** package contains multiple geometric construction functions that can be used to construct geometries such as points, lines, polygons and many more. This demonstration will showcase soome features of this functionality.

Polygon With A Hole

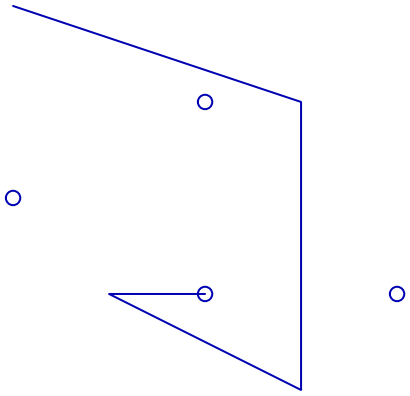
One of the special geometries that **sf** is able to build is a polygon with a hole. The code chunk below will construct such a shape. It is done by creating a polygon and its hole and combining those two together. (Code is shown for this part.)

```
polygon_border = rbind(c(1, 5), c(2, 2), c(4, 1), c(4, 4), c(1, 5))
polygon_hole = rbind(c(2, 4), c(3, 4), c(3, 3), c(2, 3), c(2, 4))
polygon_with_hole_list = list(polygon_border, polygon_hole)
plot(st_polygon(polygon_with_hole_list), col = sf.colors(12, categorical = TRUE),
     border = 'grey', axes = TRUE)
```



Another Example

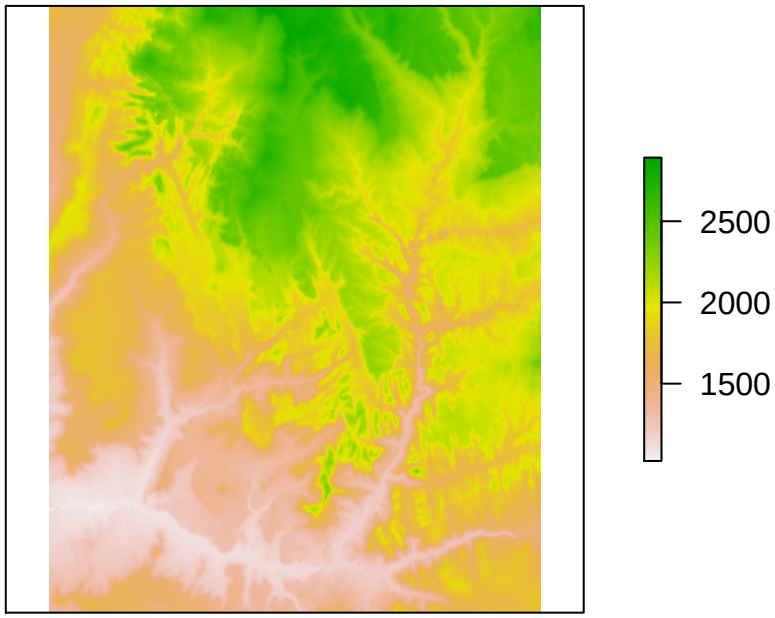
In this example, we draw two shapes together with the \textbf{st_geometrycollection} function. In this case, we combine a multipoint and a linestring:



3. Basic Map Making Example

Using the **raster** package, we can make a map using the dataset in section 2.3 of the textbook. This map uses raster.

```
raster_filepath = system.file("raster/srtm.tif", package = "spDataLarge")
new_raster = raster(raster_filepath)
plot(new_raster, axes=FALSE, )
```



This is the end of Lab 1 of GIS 3.