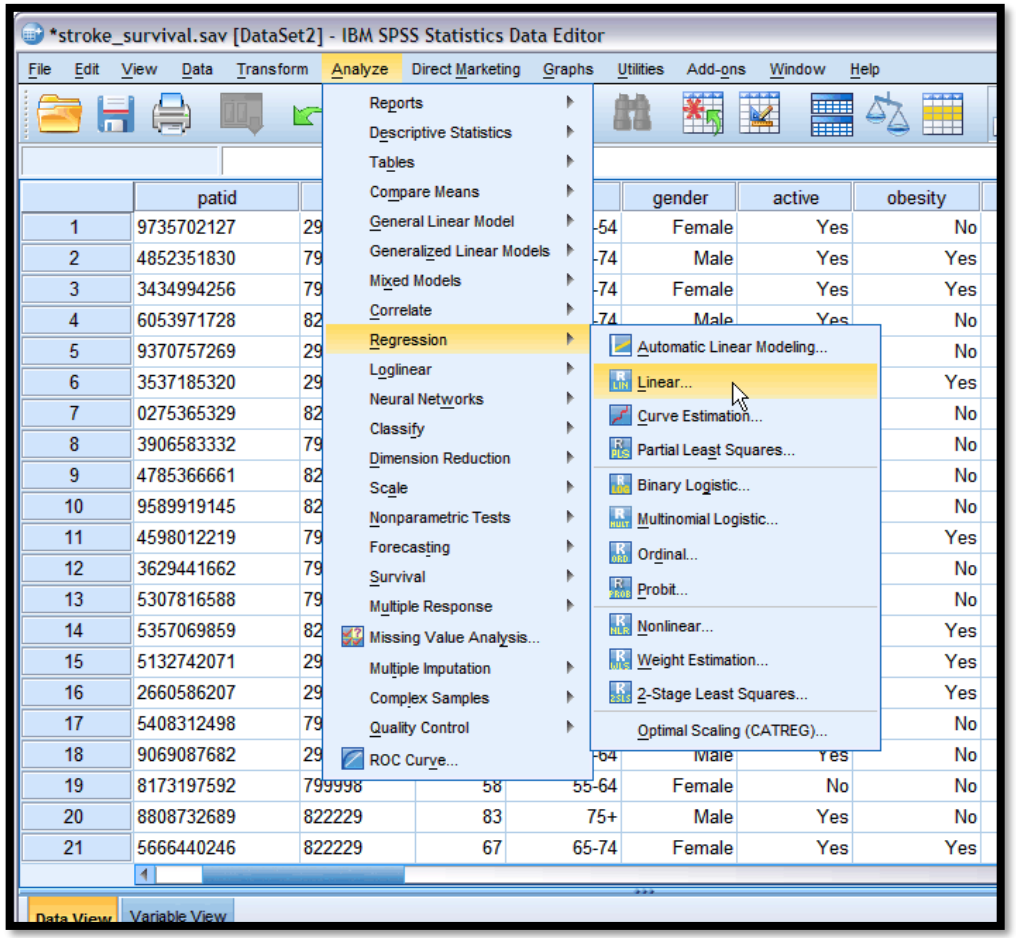
# R is a programming language developed for statistical analysis

Code driven e.g. R

```
49  # Ordinate
50  BCdist.long <- vegdist(otu.long, method = "bray")
51  mds.long <- cmdscale(BCdist.long)
52  sd.long <- sd.long %>%
53    mutate(BCX = mds.long[ , 1],
54           BCY = mds.long[ , 2],
55           month = month(dateCapt))
56
57  # Create model
58  M1 <- lmer(BCX ~ month + (1|chip), data = sd.long, REML = F)
59  M2 <- lm(BCX ~ month, data = sd.long)
60  anova(M1, M2, test = "chisq")
61
62
63  #### Seasonal variation ####
64  ggplot(sd.long, aes(x = dateCapt, y = BCX)) + stat_summary_bin() +
65    geom_point(alpha = 0.3) +
66    geom_line(aes(group = chip), alpha = 0.2) +
67    theme_classic()
68
57:10   # Mixed modelling

Console  Terminal
Z:/Vole project/vole data 15-17/
-0.3040 -0.1215 -0.0056  0.1095  0.4132

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.056741   0.029607   1.916   0.0562 .
month       -0.010903   0.005466  -1.995   0.0469 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1497 on 331 degrees of freedom
```

VS

Menu driven e.g. SPSS



# Why use a programming language?

Automate repetitive tasks

Highly flexible

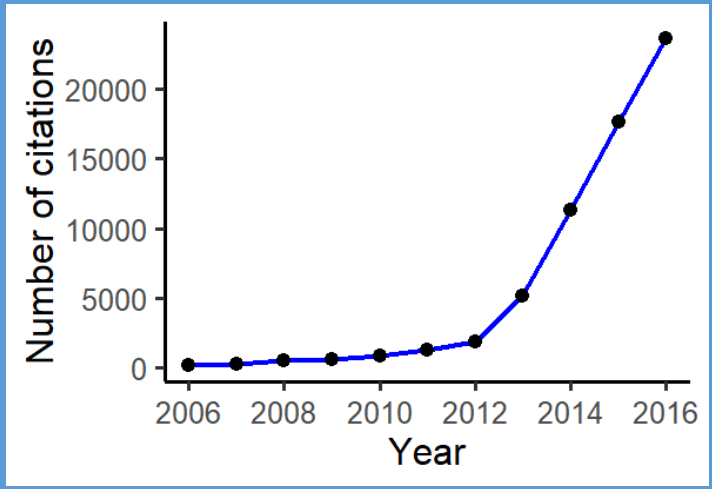
Code can be reused, modified, shared

Access to advanced tools

# Why use R?

Free and open source

Widely used and recognised

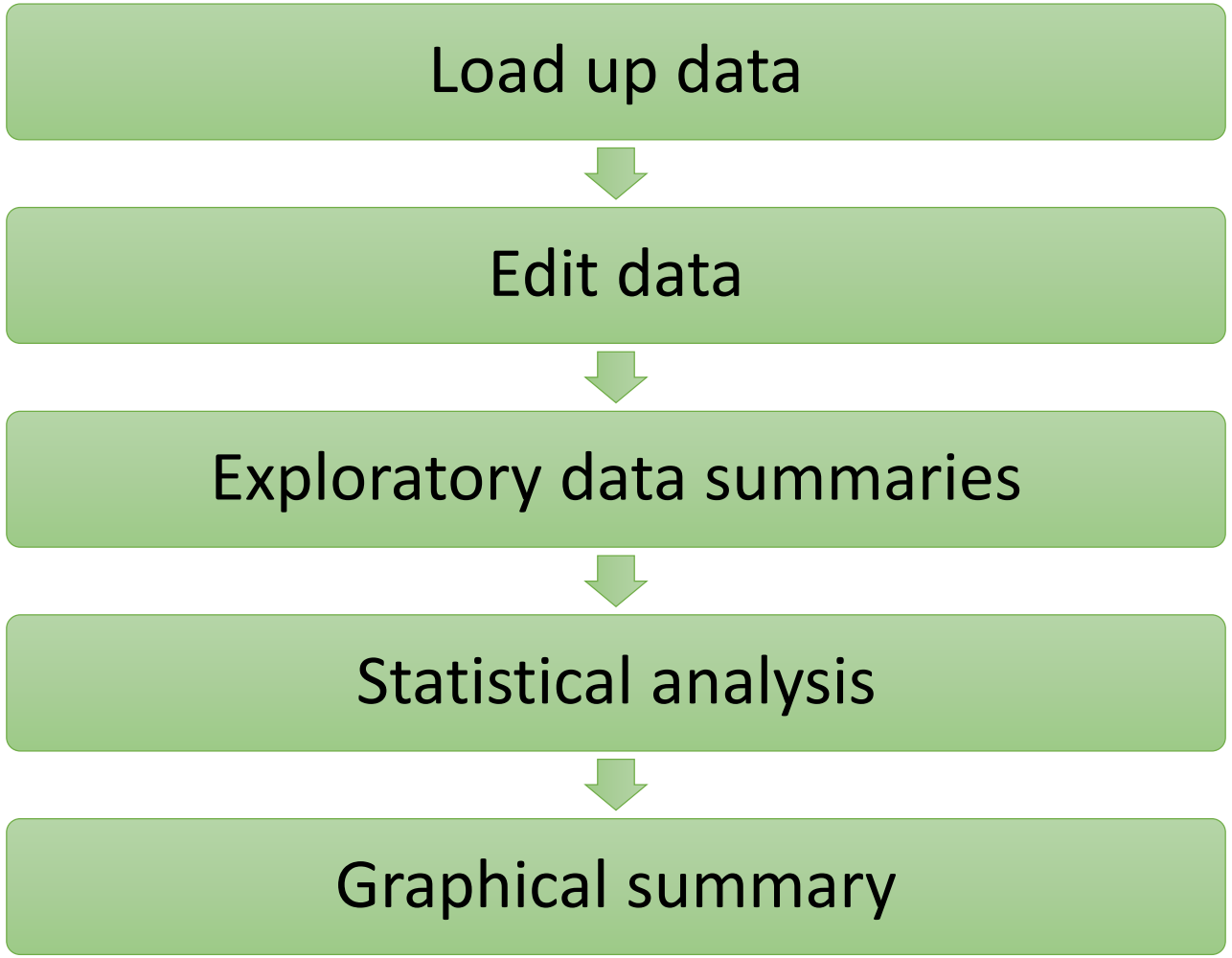



Wide array of add-on packages

Machine learning, data mining, genome analysis, etc. etc.

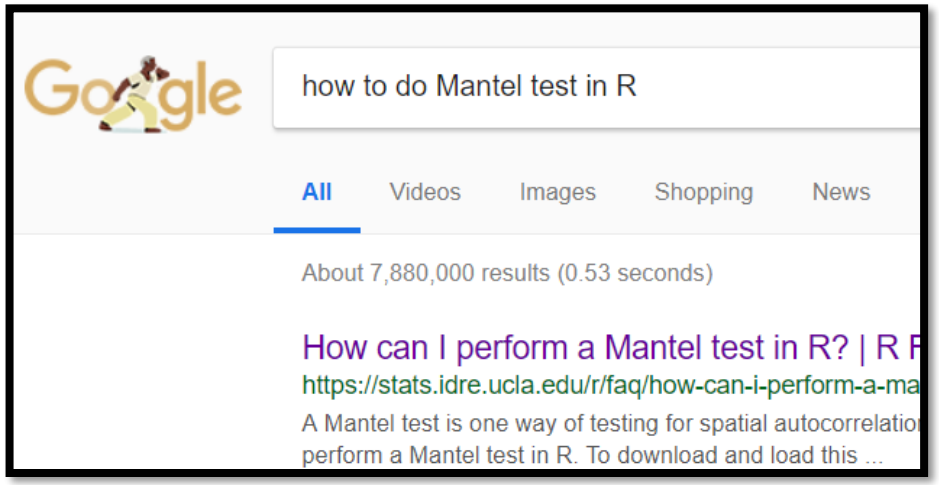
Code can be reused, modified, shared

# Example workflow



# How to find out more

- Download from www.r-project.org
- "R Studio" gives a more friendly work environment www.rstudio.com
- Books e.g. "R Cookbook" by Paul Teetor
- Lots of help online →
- Courses – keep an eye on
  CSC in the spring
- More details on SoLS coding website soon…




https://www.nottingham.ac.uk/life-sciences/facilities/slim/coding-resources.aspx