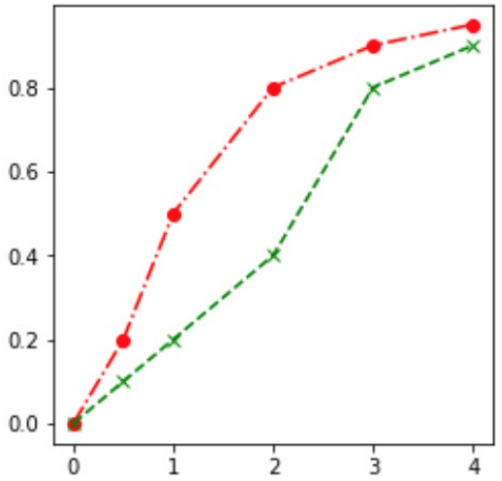
CS112 : Introduction to Python Programming

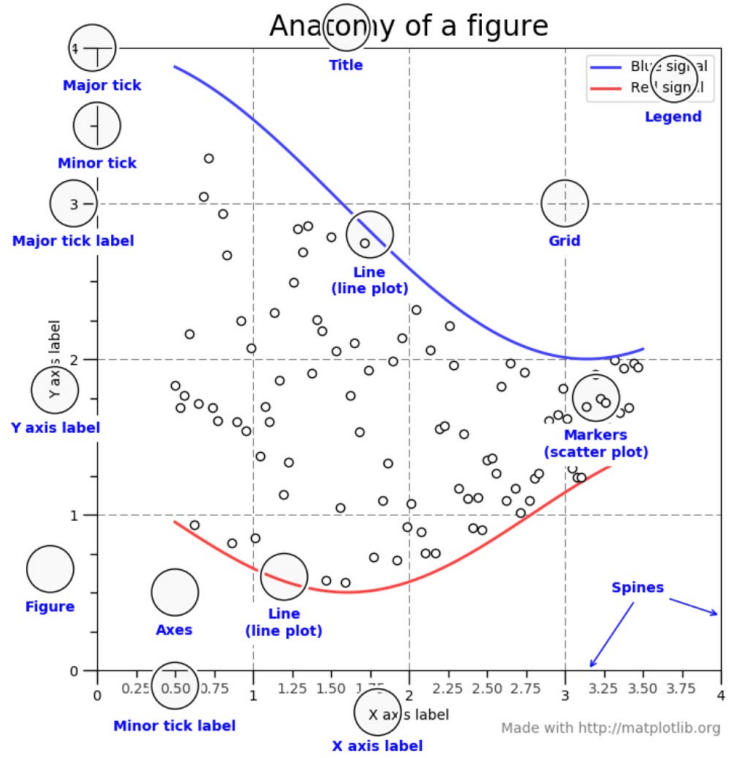
Week 14: lab practice

Practice1

1. Make line plots as in the example. Try changing every parameter of a Figure object, such as title, xlabel, ylabel, x ticks, y ticks, legend, plot color, style, …

- drug_conc = [0,0.5,1,2,3,4]
- response1 = [0,0.2,0.5,0.8,0.9,0.95]
- response2 = [0,0.1,0.2,0.4,0.8,0.9]





Practice1

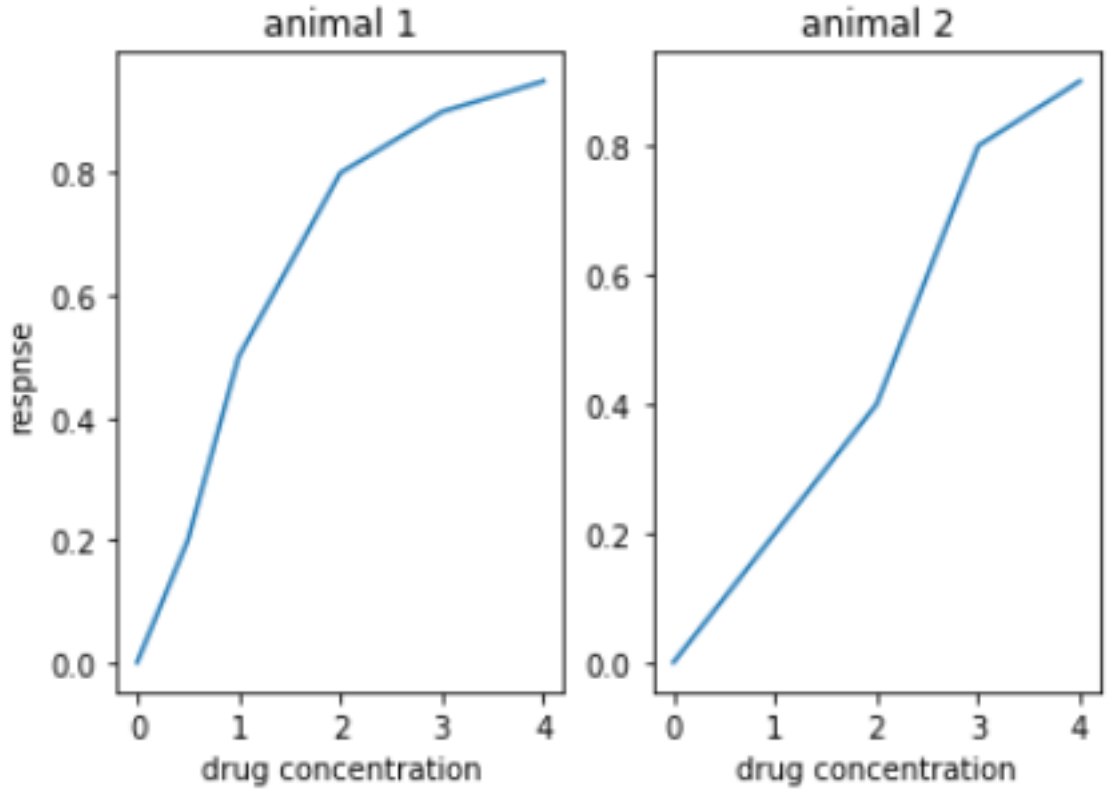
2. Save the figure in different formats, dpi and other parameters

Practice2

- Make multiple line plots in one figure. One subplot for one animal

- drug_conc = [0,0.5,1,2,3,4]
- Animal1:
  - response1 = [0,0.2,0.5,0.8,0.9,0.95]

- Animal2:
  - response2 = [0,0.1,0.2,0.4,0.8,0.9]

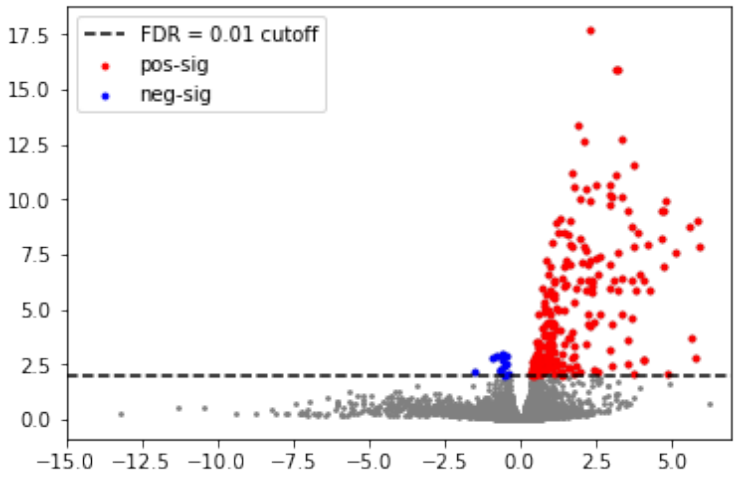


Practice3

- For an RNA-seq data, in which logFC and FDR values are given.
- Make a volcano plot, in which x-axis is logFC and y-axis is –log10(FDR). Format the figure as follows:

RNA_seq_data.csv

gene	logFC	FDR
Irf9	2.31434079	1.77E-18
ENSMAUG0(	3.20472627	1.24E-16
ENSMAUG0(	3.15509226	1.24E-16
Stat1	1.91988266	4.02E-14
Cmpk2	3.35976928	1.65E-13
Parp9	2.1444571	2.31E-13
Herc6	3.74984862	2.91E-12
Adar	1.71609479	5.82E-12

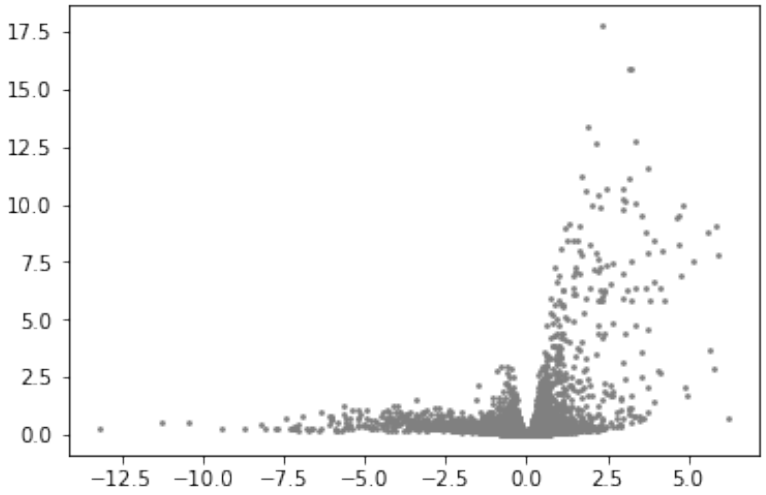


-log10(FDR) < 2 : grey, small dots
-log10(FDR) > 2 : large dots
log2FC>0 : red
log2FC<0 : blue

Draw a cutoff line at -log10(FDR) = 2

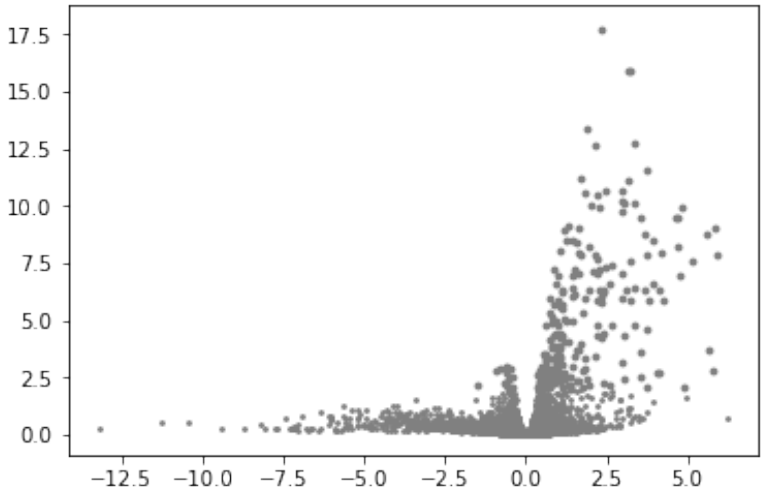
Practice3

Step1:



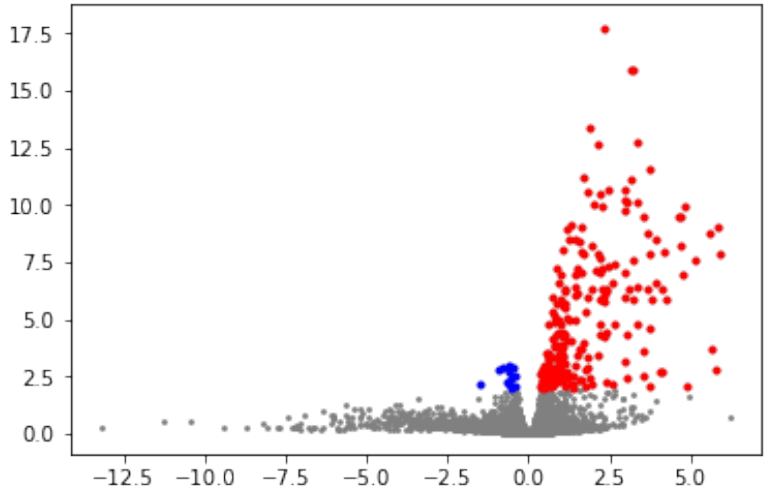
Scatter plot:
x-axis: log FC
y-axis : -log10(FDR)

Step2:



-log10(FDR) < 2: small dots
-log10(FDR) > 2: large dots

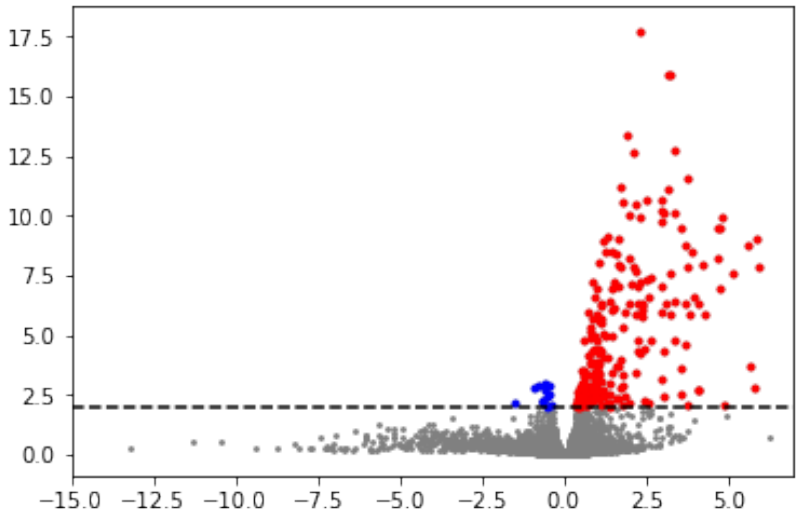
Step3:



log2FC>0 : red
log2FC<0 : blue

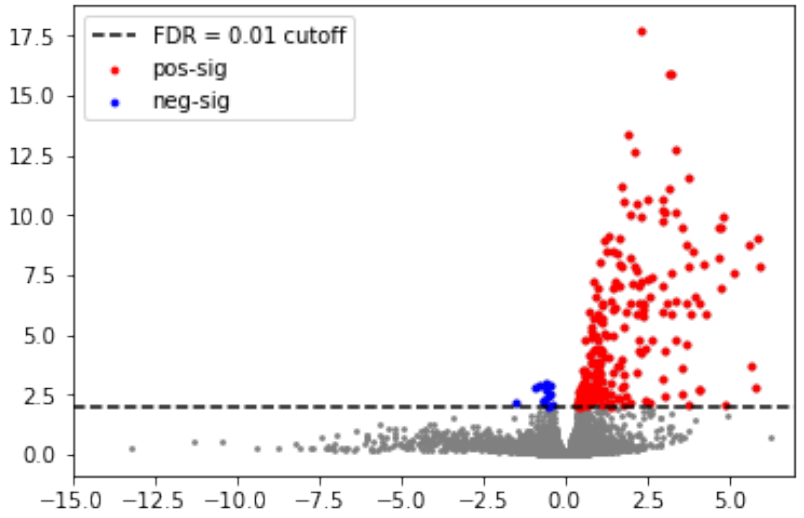
Practice3

Step4:



Draw a cutoff line at FDR =0.01

Step5:



Add legend

Practice4

- Write a program that plots a bar graph of the codon frequencies for a given amino acid T

- codon_usage.csv

codon	single	triple	relative_frequency
ACA	T	Thr	0.28
ACG	T	Thr	0.11
ACT	T	Thr	0.25
ACC	T	Thr	0.36