

## Statistics practical class 2

- 1) Plot a normal distribution  $N(0, 1)$  and the t-student distributions with 2, 5, 30 and 100 degrees of freedom. What happens when n increases? What parameter of the t distribution does this affect? (see ?seq, ?dnorm and ?plot)
- 2) Plot two binomial distributions:  $B(20,0.5)$  and  $B(50,0.3)$ . Can you approximate any of these with a normal distribution? (see ?rbinom)
- 3) Plot a Poisson distribution  $Pois(12)$ . What does the value of lambda control. How could you approximate it to a normal distribution? (see ?rpois)
- 4) Given  $X \sim N(0,1)$ , what is the probability of obtaining x from X , such that  $x > 1.96$ . Compare this with  $T(i)$  for  $i = 10, 20, 30, 100$  and 100000. (see ?pnorm and ?pt)
- 5) From table bioenv-2, find the covariance and correlation between the species abundance variables and temperature. Are any of these correlations significant? Do this with parametric and nonparametric methods. (Find out how to do this your self using the ??foo)
- 1) Follow up by plotting these variables against one another (see ?pairs). What do you observe?
- 6) Calculate and plot a linear regression for an appropriate pair of variables in your data table. How much are the explained and residual variability? Are the residuals normally distributed? Perform residual plots.
- 7) Calculate the total, residual and fitted variability.