Summary of Part II

Regression and Linear Modelling

Models

- Simple Linear Regression
- Polynomial Regression
- Multiple Regression
- Models with factor predictors (connection to ANOVA)
- Models with continuous covariates
- Models with both factor predictors and continuous covariates
- Models with main effects and interactions

Modelling assumptions

- Systematic component and random (residual) component
- Assumptions about the residuals
  - normality
  - constant variance
  - independent of covariates

Statistical analysis for a single model

- Parameter estimation via Least Squares
- Standard Errors
- Hypothesis tests
- Prediction from the regression model, with standard errors and confidence intervals
- Parameterization of model
- Counting parameters
- Interpretation of parameters
- Sample Correlation

Model assessment for a single model

- R^2 and adjusted R^2
- Residual and standardized residual plots
- Checking normality using P-P and Q-Q plots
- Outliers

Model comparison

- F-tests for nested models
- Forward and Backward selection
- Finding the simplest model that adequately explains the data.