VCE General Mathematics Unit 3

Sample learning activity: Data analysis: bivariate numerical data – to transform or not?

Introduction

This learning activity explores transforming some forms of data to linearity using simple transformations applied to one axis scale. In preparation for this activity a range of bivariate numerical data sets relating to topics of interest should be obtained, for example, from the [Australian Bureau of Statistics](https://www.abs.gov.au/), the [OECD](https://data.oecd.org/) or other sources.

Part 1

Obtain a suitable bivariate numerical data set for a context of interest where there appears to be little or no association between the variables.

1. Draw the corresponding scatterplot and residual plot and calculate the summary linear regression statistics.
2. Interpret these with respect to the context.

Part 2

Obtain a suitable bivariate numerical data set for a context of interest where there seems to be a moderate linear association between the variables.

1. Draw the corresponding scatterplot and residual plot and calculate the summary linear regression statistics.
2. Interpret these with respect to the context.

Part 3

Obtain a suitable bivariate numerical data set for a context of interest where there seems to be a moderate non-linear association between the variables.

1. Draw the corresponding scatterplot and residual plot and calculate the summary linear regression statistics.
2. Transform one of the axes scales and carry out analysis to see if this improves the fit of the model to the data.
3. Interpret these with respect to the context.

Areas of study

The following content from the areas of study is addressed through this task.

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| **Unit 2** | | |
| **Area of study** | **Topic** | **Content dot points** |
| Data analysis, probability and statistics | Investigating associations between two variables  Investigating and modelling linear associations | 1, 4, 5, 6, 7  1, 2, 3, 4, 5, 6, 7, 8, 9 |

Outcomes

The following outcomes, key knowledge and key skills are addressed through this task.

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| **Unit 2** | | |
| **Outcome** | **Key knowledge dot point** | **Key skills dot point** |
| 1 | 1, 7, 9, 10, 11, 12 | 8, 9, 10, 11, 12, 13, 14 |
| 2 | 1, 3, 4 | 1, 4 |
| 3 | 1, 3, 4, 5, 7 | 2, 3, 4, 5, 6, 8, 9, 10 |