

## MATU9D2 : PRACTICAL STATISTICS WEEKLY ASSIGNMENT 8

This should be submitted via your tutor's box outside **room 4B89**. Ensure that you have the Course Name, your Name and Practical Group clearly marked on your answers. Your answers should be submitted by ..

<b>Tuesday Group:</b>	<b>12noon on Friday 24 March</b>
<b>Thursday Group:</b>	<b>4pm on Tuesday 28 March</b>
<b>Friday Groups:</b>	<b>4pm on Wednesday 29 March</b>

**Complete the following questions both questions by hand (including full working) and by Minitab.**

Manatees are large sea creatures that live in the shallow water along the coast of Florida. Many manatees are injured or killed by power boats. The following are data on the number of manatees killed and the number of power boat registrations (in thousands of boats) in Florida over a 10 year period.

Powerboat Registrations (x)	Number of Manatees killed (y)
447	13
460	17
481	24
498	21
513	24
512	20
526	28
559	31
585	33
600	35

Summary Statistics :

$$\begin{aligned}
 \sum y_i &= 246 & \sum x_i &= 5181 \\
 \sum y_i^2 &= 6510 & \sum x_i^2 &= 2707469 \\
 \sum x_i y_i &= 130547
 \end{aligned}$$

From Weekly Assignment 7, you have a plot and have calculated r. Use these and answer the following:  
(If you have not submitted Weekly Assignment 7, draw the plot and calculate r now)

**NEW QUESTIONS OVERLEAF**

- (i) Is there a significant correlation between powerboat registrations and the number of manatees killed?
- (ii) Perform a simple linear regression of the number of manatees killed against the number of powerboat registrations. Estimate all the parameters in the model and provide an estimate of the error variance  $\sigma^2$ . Then draw the fitted regression line on a scatter plot of the data.
- (iii) Carry out an appropriate test to investigate whether there is a linear relationship between powerboat registrations and the number of manatees killed.
- (iv) Calculate a 95% confidence interval for the average number of manatees killed given the number of powerboat registrations is 460,000.
- (v) Calculate a 95% prediction interval for the number of manatees killed given the number of powerboat registrations is 460,000.