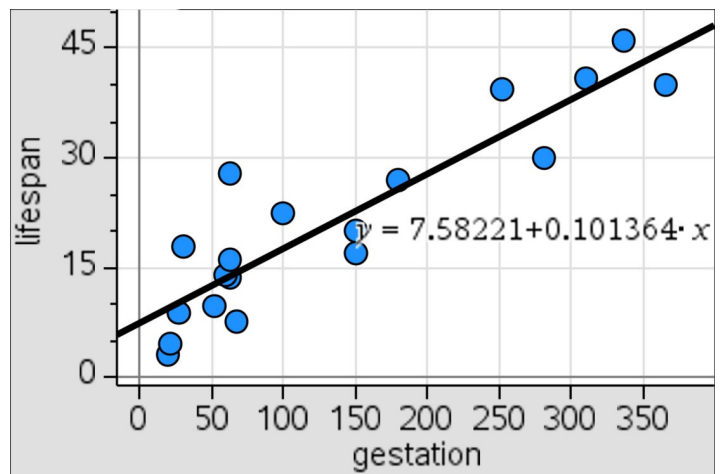


# Bivariate Data – Sample Task 1

The life span, in years, and gestation period, in days, for 19 types of mammals are displayed in the table below.

<i>Life span (years)</i>	<i>Gestation period (days)</i>
3.20	19
4.70	21
7.60	68
9.00	28
9.80	52
13.7	63
14.0	60
16.2	63
17.0	150
18.0	31
20.0	151
22.4	100
27.0	180
28.0	63
30.0	281
39.3	252
40.0	365
41.0	310
46.0	336

RegEqn	$a+b \cdot x$
a	7.58221
b	0.101364
$r^2$	0.816685
r	0.903707



A least squares line that enables life span to be predicted from gestation period is fitted to this data.

## Task.1

Name the ***explanatory variable*** in the equation of this least squares line.

Explanatory variable: Gestation Period (days)

## Task.2

Determine the ***equation of the least squares line*** in terms of the variables life span and gestation period. Write your answers in the appropriate boxes provided below. Round the numbers representing the intercept and slope to three significant figures.

Life span (years)	=	7.58	+	0.101	x	Gestation Period (days)
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### Task.3

Write the value of the **correlation coefficient** rounded to three decimal places.

$$r = 0.904$$

### Task.4

Describe the **association** between the two variables, in terms of direction, form and strength.

*This indicates there is a strong, positive, linear association between the life span (years) and the gestation period (days)*

### Task.5

Write the value of the **coefficient of determination** rounded to three decimal places.

$$r^2 = 0.817$$

### Task.6

Interpret the **coefficient of determination** in terms of *life span* and *gestation period*.

*We can conclude from this that 81.7% of the variation in life span can be explained by the variation in the gestation period.*

### Task.7

Interpret the **slope** of the least squares line in terms of *life span* and *gestation period*.

*On average, for every extra day of gestation the life span of the mammal increases by 0.101 years.*

### Task.8

Interpret the **y-intercept** of the least squares line in terms of *life span* and *gestation period*.

*A mammal of gestation period 0 days has a life expectancy of 7.58 years.  
This is a nonsensical interpretation.*

### Task.9

One particular set of data from the table stated that a mammal of gestation period of 63 days had a life span of 28 years.

Calculate the residual for this set of data, to two decimal places.

**Step.1** Calculate the predicted life expectancy (years) for a gestation period of 63 days

$$\text{Life span (years)} = 7.58 + 0.101 \times \text{gestation period (days)}$$

$$\text{Life span (years)} = 7.58 + 0.101 \times 63$$

$$\text{Life span (years)} = 13.94$$

**Step.2** Calculate the residual for a gestation of 63 days

$$\text{Residual} = (\text{Actual } y \text{ value}) - (\text{Predicted } y \text{ value})$$

$$\text{Residual} = 28 - 13.94$$

$$\text{Residual} = 14.06$$

$\text{residual} = 14.06$

