Response and explanatory variables

Tuesday, 26 February 2019 12:56 PM

★ By the end of the lesson I would hope that you have an understanding and be able to apply to questions the following concepts:

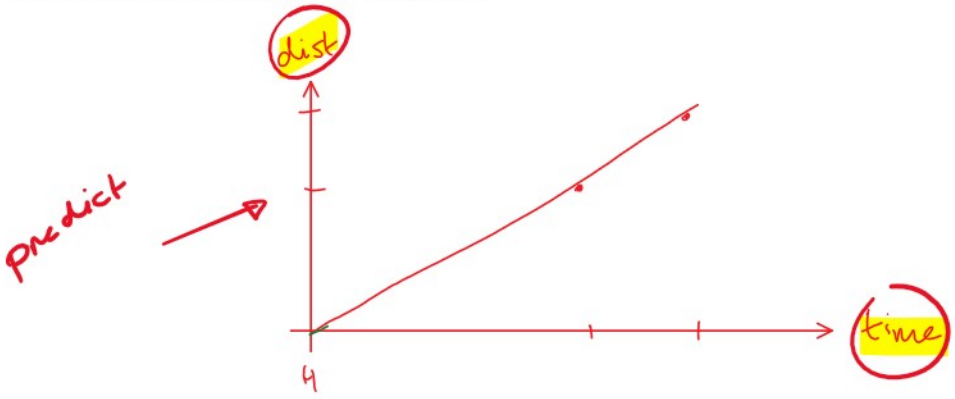
- Know what it means to be an explanatory variable
- Know what it means to be a response variable
- Know how to identify response and explanatory variables in worded questions

RECAP:

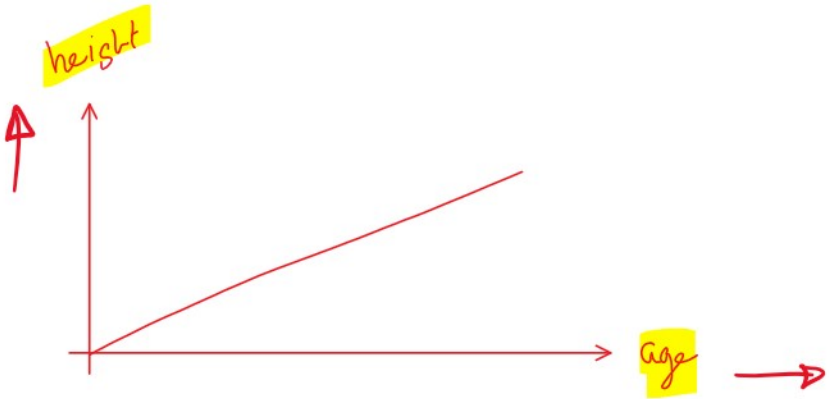
This is a new section of the Core Data course.
We have looked at ways of displaying data, describing data and comparing the distributions of data.
This was done for single data sets or considering only one set of data.
Now we need to look at how we can compare or relate two sets of data together to see if there is a relationships between the two of them.
When we compare two sets of data, we call them **bivariate data**.

Are they related?

Let's look at time and distance travelled when in my car.
I would hope there is some form of relationship.



What about a relationship between age and height?
We would hope that the older you get, the higher you get.

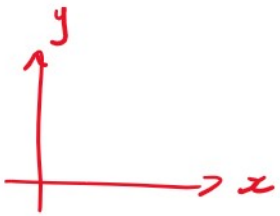


There are many things which might have a relationship.
We can use Mathematics to help us see (or decide) if there is a relationship between two sets of data.
As is normal with Mathematics, Barry has been at it with naming things!

RESPONSE





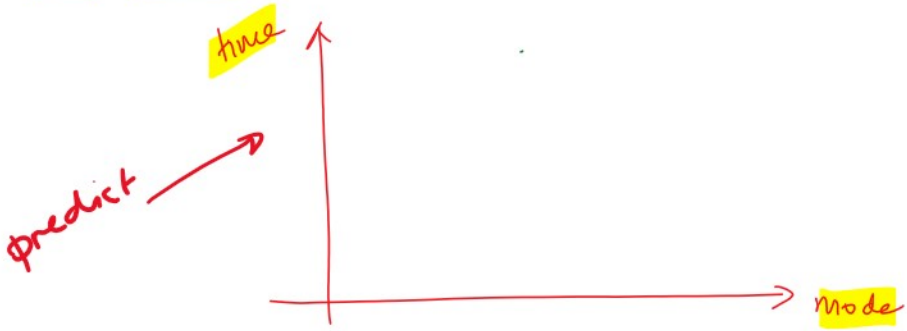


We use the explanatory variable to explain changes that might be observed in the response variable.

Example of where this is used

The following question is extracted from the *Cambridge Further Mathematics Units 3 and 4 textbook.*

We wish to investigate the question, 'Does the time it takes a student to get to school depend on their mode of transport?' The variables here are time and mode of transport. Which is the response variable (RV) and which is the explanatory variable (EV)?



EV: mode

RV: time

Can we predict people's height (in cm) from their wrist measurement? The variables in this investigation are height and wrist measurement. Which is the response variable (RV) and which is the explanatory variable (EV)?

EV: Wrist

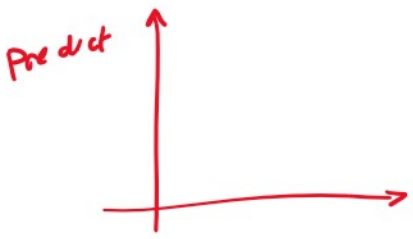
RV: Height



The important stuff

Response and explanatory variables

When investigating the association between two variables the explanatory variable (EV) is the variable we expect to explain or predict the value of the response variable (RV).





VCAA Exam Question on this concept
2018 Paper 2

Table 4

	Congestion level (%)								
Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
Melbourne	25	26	26	27	28	28	28	29	33

c. When a least squares line is used to model the trend in the data for Melbourne, the intercept of this line is approximately –1514.75556

Round this value to four significant figures. 1 mark

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d. Use the data in Table 4 to determine the equation of the least squares line that can be used to model the trend in the data for Melbourne. The variable *year* is the explanatory variable.

Write the values of the intercept and the slope of this least squares line in the appropriate boxes provided below.

Round both values to four significant figures. 2 marks

congestion level = ☐ + ☐ × *year*