# Time Series Notes AS 3.8

# This topic requires you to carry out an investigation using the PPDAC cycle.

It also requires you to **integrate contextual knowledge** in the production of a report on time series data.

## Problem:

* Introduce the context
* Write your **problem/question/purpose**
  + Eg. I am going to investigate whether or not there is an increasing/decreasing trend in\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(include units/context)
* **Write your hypothesis**
  + Eg. I expect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Could also investigate extra things such as the **rate of such change.**   
  Eg: amount of increase per month(year) from date \_\_\_\_\_ to date \_\_\_\_\_   
  = amount of increase/number of months(years).

## Plan/Data

* I will use Inzight to produce graphs of my Time Series data on\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. I will use the decomposed graphs to get a clear picture of the long term trend and any seasonal cycles. I will used the recomposed model to make predictions for the future and will consider the residual values to decide how well my model fits the data.

## Analysis – wherever possible give dates, values, context, units

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Min | Max | Range | % contribution |
| Raw |  |  |  | baseline |
| Trend |  |  |  |  |
| Seasonal |  |  |  |  |
| residual |  |  |  | Just consider individual residuals |

Note that these are only ball park figures from Inzight graphs.

[Remember (in reverse order)Pred CRUST]

Trend:  
 The overall trend showed an increase/decrease in \_\_\_\_\_\_\_\_\_\_\_\_\_\_(whatever you are investigating).

The trend ranged from \_\_\_\_\_\_\_\_\_\_(number) in \_\_\_\_\_\_\_(date) to \_\_\_\_\_\_\_\_\_\_(number) in \_\_\_\_\_\_\_(date), an overall range of \_\_\_\_\_\_\_\_\_\_\_\_\_\_(give units).

State any changes, blips. Explain these in context if possible, or explain that you were unable to find a reason.

### Seasonal Component

Consistent/inconsistent pattern. Peaks of around\_\_\_\_\_\_\_\_\_\_(number) in \_\_\_\_\_\_\_(time period). Troughs of around \_\_\_\_\_\_\_\_\_\_(number) in \_\_\_\_\_\_\_(time period). (give contextual reasons)

Unusual parts of **any** of the graphs – Explain these in context if possible, or explain that you were unable to find a reason.

### Residuals

Comment whether any/many individuals were over 10% of the **overall range** in the raw data.

Few/small🡪 confident that model provides a good fit/predictions will be accurate

Lots/big 🡪 not confident that model provides a good fit/predictions will be accurate

### Component Contribution

The main source of variation in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_data is the \_\_\_\_\_\_\_\_\_\_\_\_\_component. The \_\_\_\_\_\_\_\_\_\_\_\_ and residual values account for the remaining variation in the series.

### Predictions

* Print off a (tidy) table of predicted values.
* Explain one or two predictions in detail

*Eg. I have produced predictions for the next 24 months, together with their prediction intervals*

*For example, in March 2013, I predict that there will be around 12.4 million km2 of Arctic Sea Ice. I am 95% confident that the true area of Arctic Sea Ice will be between 10.2 and 14.6 km2.   
Because the majority of residuals are very small (less than 10%) I think that my predictions will be reasonably accurate.*

## Conclusion

Comment on accuracy of model/predictions.

Who might find these results useful?

How could the research be used?

Contextual reflection