

exercise_02_plotting_salinity

August 15, 2021

1 Exercise - plotting and stats

First load what we need and create a dataset (the code below is exactly what we did in the class, compressed into one cell).

```
[1]: import xarray as xr
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline

argo_data = np.load('../data/argo_float_4901412.npz')

data_vars = {'salinity': (('level', 'date'), argo_data["S"]),
             'temperature': (('level', 'date'), argo_data["T"]),
             'pressure': (('level', 'date'), argo_data["P"])}

# A dictionary of coordinates
coords = {'level': argo_data["levels"], 'date': argo_data["date"]}

argo = xr.Dataset(data_vars, coords)
```

In the lesson, we took the standard deviation of every variable in a DataSet and plotted them like this:

```
argo_std = argo.std(dim='date')
```

```
argo_std.temperature.plot()
```

However, in python, functions can sometimes be chained together. For example:

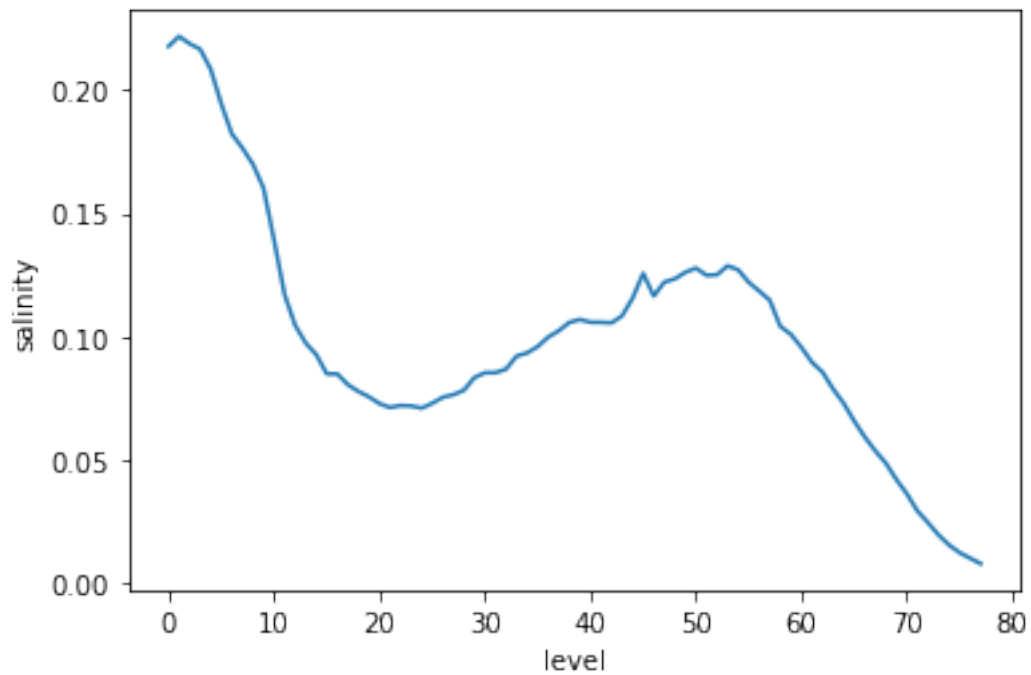
```
import numpy as np
```

```
x = np.random.rand(10, 10) # Create an array of random numbers
x.mean(axis=1).min() # Compute the mean along one axis, then the minimum.
```

So do we need to create the variable `argo_std` before plotting? Could we do the standard deviation and plot in one line of code? Have a go...

```
[2]: argo.salinity.std(dim='date').plot()
```

```
[2]: [<matplotlib.lines.Line2D at 0x7fa7a534cfd0>]
```



How do you find the maximum standard deviation in salinity? Again, try in one line of code. Does the answer match your expectation from the plot above?

```
[3]: argo.salinity.std(dim='date').max()
```

```
[3]: <xarray.DataArray 'salinity' ()>  
array(0.22181831)
```