Decoding BUFR files

Command line practical

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ECMWF

Decoding BUFR files using command line tools

- You can go to **ecs** and create a Jupyter session with

ecinteractive –j

Log in with your user name/password/token. It will create a *Jupyter* notebook for you(console).

Create a subdirectory under your **$HOME** directory

Copy the file **/perm/marg/BUFR_TRAINING/BUFR_DecodingPracticals.tar** into your **$HOME** directory. (If **perm** does not work use **/home/marg/Practical**)

Un-compress the tar file with the **BUFR__DecodingPracticals.tar** into the subdirectory you created in the previous step.

If you go to the main menu and select ***File/New/Terminal*** you will have a terminal.

- You will have several files there

Decoding BUFR using command line tools

```
airTemp.flt
ASR1.b
BSSY.b
bufr_khanun.bufr
msg1.b
printLat.flt
reader.py
tcPractical.ipynb
tcPracticalSol.ipynb
TEMP.b
```

You need to load the **ecmwf-toolbox** to be able to use the command line tools

```
module load ecmwf-toolbox
```

Decoding BUFR using command line tools

1. How many messages contains the file **ASR1.b**?

2. How many subsets contains each message of the file **ASR1.b?**

3. Run the following command

```
bufr_dump –p BSSY.b |grep ‘airTemperature’
```

What do you get? Can you create a filter file that produces the same output.
You can have a look at the **airTemp.flt** file.

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4. Run the command **bufr_filter** with the filter file **printLat.flt** on the file **ASR1.b.** Can you modify this filter to print also the longitudes?
5. Copy message 1 from the file **ASR1.b** into **msg_ASR1_1.b**. Do the same with message 5 from the **ASR1.**b and copy it to the file msg_ASR1_5.b . Use **bufr_compare** to see the differences between these two files.
6. Run the following command on the file **TEMP.b.** What do you see? Can you find any replication descriptor?

```
bufr_dump –w count=1 –d TEMP.b |less
```

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7. Use **bufr_copy** to copy the first message of the file **BSSY.b** into **msg_BSSY_1.b**
8. Run the following command.

```
bufr_dump  -E python msg_BSSY_1.b |less
```

9. What is the result? Send it to a file and explore it. You will find the same general structure that we explained before.

Going a bit further

- Let’s take the file BSSY.b that contains synops reports. If we do

```
bufr_ls -s unpack=1 -p count,stationOrSiteName BSSY.b
```

- We can see a list of stations. We may be interested in knowing where this data comes from. We can visit this website https://oscar.wmo.int/surface/ and search for the station (for example FES-SAIS) we can find , location, type of station measurements, contact points, and the WIGOS identifier, that looks like this

0-20000-0-60141

The WIGOS identifier is explained here https://library.wmo.int/records/item/55696-guide-to-the-wmo-integrated-global-observing-system