Exploring the Array Data Model of an Image

By the end of this activity, you will be able to:

1. Display an image
2. View the dimensions and pixel values in a image.

Step 1. Open a terminal shell. Open a terminal shell by clicking on the square black box on the top left of the screen.

Change into the image directory:

```
cd Downloads/big-data-2/image
```

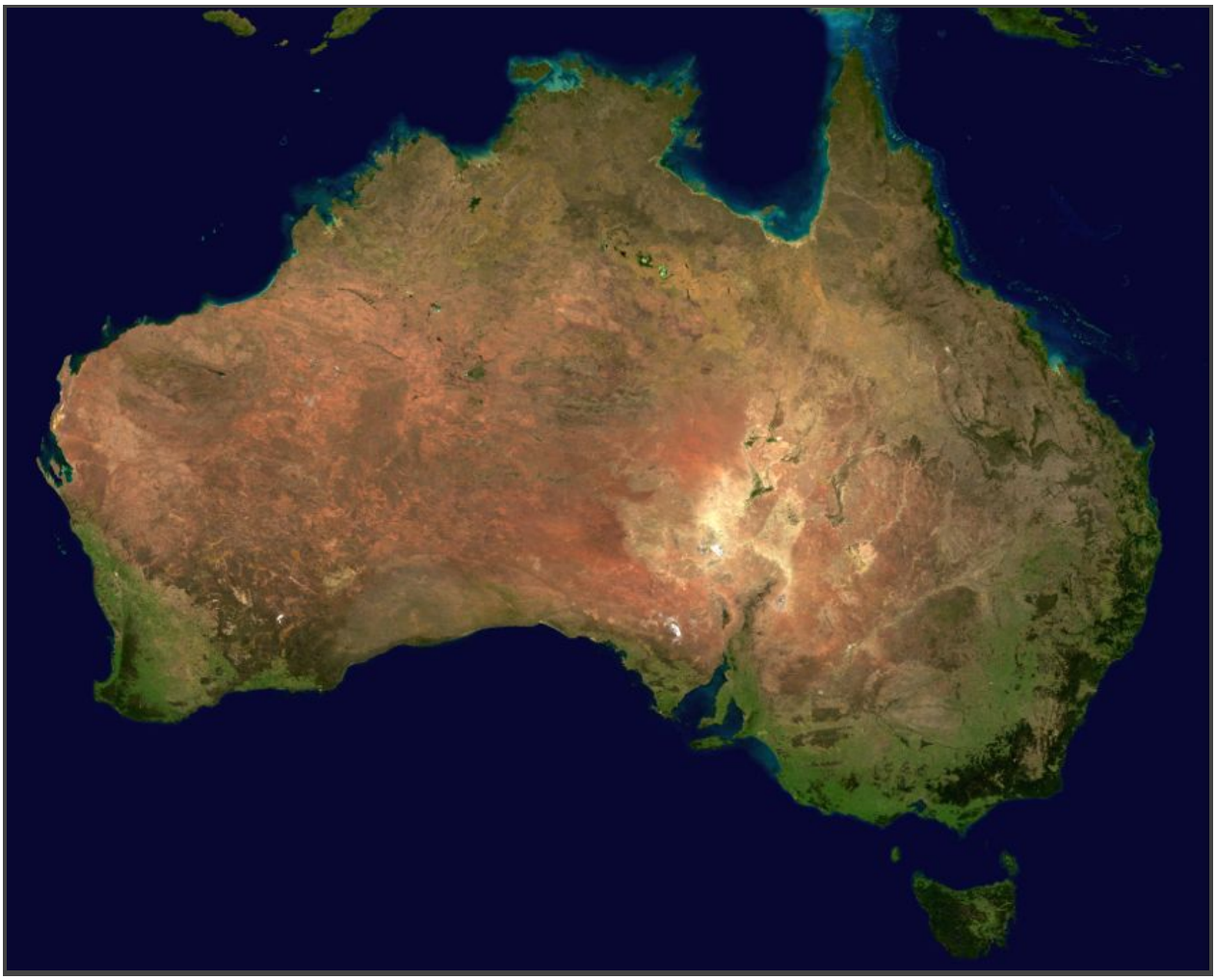
Run *ls* to see the image and scripts:

```
ls
```

```
[cloudera@quickstart ~]$ cd Downloads/big-data-2/image/
[cloudera@quickstart image]$ ls
Australia.jpg  dimensions.py  pixel.py
[cloudera@quickstart image]$
```

Step 2. Display the image. Display the image by running *eog Australia.jpg*. eog stands for Eye of Gnome and is a common image viewer on Linux systems.

```
eog Australia.jpg
```



Next, click on the terminal window, and enter *control-z* and *bg* to run eog in the background.

Step 3. View the dimensions. We can view the dimensions of the image by running:

```
./dimensions.py Australia.jpg
```

```
[cloudera@quickstart image]$ ./dimensions.py Australia.jpg
size = 5250 columns x 4320 rows
mode = RGB 3x8-bit pixels, true colour
```

This says that the image has 5250 columns and 4320 rows, and each cell is comprised of three 8-bit pixels for Red, Green, and Blue.

Step 4. View pixel values. We can view pixel values at different locations in the image by running the pixel.py script. To view the pixel value at location 0, 0, run:

```
./pixel.py Australia.jpg 0 0
```

```
[cloudera@quickstart image]$ ./pixel.py Australia.jpg 0 0
(11, 10, 50)
```

This says the values for Red = 11, Green = 10, and Blue = 50. The corners of the image are ocean, so we expect a high value for Blue, and low values for Red and Green.

To view the pixel value at another corner of the image, run:

```
./pixel.py Australia.jpg 5000 0
```

```
[cloudera@quickstart image]$ ./pixel.py Australia.jpg 5000 0
(11, 10, 50)
```

This is the same result since location 5000 0 is also ocean.

Now let's look at a pixel value of land near the middle of the image:

```
./pixel.py Australia.jpg 2000 2000
```

```
[cloudera@quickstart image]$ ./pixel.py Australia.jpg 2000 2000
(118, 89, 57)
```

This says the values for Red = 118, Green = 89, and Blue = 57. The land is orange and yellow, so we expect higher values for Red and Green than Blue.