

ses6prompt

January 25, 2024

- 1 Using numpy, two functions are made that returns the result of $\sin(x)$ and $\cos(x)$ with x being a parameter that is input when the functions are called.

```
[15]: import numpy as np
      from astropy.table import Table
```

```
[16]: def resSin(x):
      return np.sin(x)
```

```
[17]: def resCos(x):
      return np.cos(x)
```

- 1.1 Using Table from astropy.table, a table will be generated with 1000 entries where the $\text{resSin}(x)$ and $\text{resCos}(x)$ are compared with x being 0 to 2π .

```
[18]: x = np.linspace(0.0, np.pi * 2, 1000)
      y = resSin(x)
      z = resCos(x)

      data = Table()
      data["x = 0 - 2pi"] = x
      data["sin(x)"] = y
      data["cos(x)"] = z

      data["x = 0 - 2pi"].format = "{:.3f}"
      data["sin(x)"].format = "{:.3f}"
      data["cos(x)"].format = "{:.3f}"

      print(data)
```

```
x = 0 - 2pi sin(x) cos(x)
-----
      0.000  0.000  1.000
      0.006  0.006  1.000
      0.013  0.013  1.000
      0.019  0.019  1.000
```

```

0.025  0.025  1.000
0.031  0.031  1.000
0.038  0.038  0.999
0.044  0.044  0.999
0.050  0.050  0.999
0.057  0.057  0.998

```

```

...    ...    ...
6.220 -0.063  0.998
6.227 -0.057  0.998
6.233 -0.050  0.999
6.239 -0.044  0.999
6.245 -0.038  0.999
6.252 -0.031  1.000
6.258 -0.025  1.000
6.264 -0.019  1.000
6.271 -0.013  1.000
6.277 -0.006  1.000
6.283 -0.000  1.000

```

Length = 1000 rows

1.2 Using a for loop, the first 10 values of x, sin(x) and cos(x) will be printed in columns.

```

[20]: i = 1
      for row in data:
          if i <= 10:
              print(row)
              i = i+1

```

```

x = 0 - 2pi sin(x) cos(x)
-----
0.000  0.000  1.000
x = 0 - 2pi sin(x) cos(x)
-----
0.006  0.006  1.000
x = 0 - 2pi sin(x) cos(x)
-----
0.013  0.013  1.000
x = 0 - 2pi sin(x) cos(x)
-----
0.019  0.019  1.000
x = 0 - 2pi sin(x) cos(x)
-----
0.025  0.025  1.000
x = 0 - 2pi sin(x) cos(x)
-----
0.031  0.031  1.000
x = 0 - 2pi sin(x) cos(x)

```

```

-----
0.038  0.038  0.999
x = 0 - 2pi sin(x) cos(x)
-----
0.044  0.044  0.999
x = 0 - 2pi sin(x) cos(x)
-----
0.050  0.050  0.999
x = 0 - 2pi sin(x) cos(x)
-----
0.057  0.057  0.998

```

[]: