# Computational Publishing for Archives

Simon Worthington

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# Preface

This is a Quarto book.

To learn more about Quarto books visit https://quarto.org/docs/books.

# 1 Introduction

This is a book created from markdown and executable code.

See Knuth (1984) for additional discussion of literate programming.

# 2 Summary

In summary, this book has no content whatsoever.

# 3 Quarto Basics

For a demonstration of a line plot on a polar axis, see Figure 3.1.

```
import numpy as np
import matplotlib.pyplot as plt

r = np.arange(0, 2, 0.01)
theta = 2 * np.pi * r
fig, ax = plt.subplots(
  subplot_kw = {'projection': 'polar'}
)
ax.plot(theta, r)
ax.set_rticks([0.5, 1, 1.5, 2])
ax.grid(True)
plt.show()
```

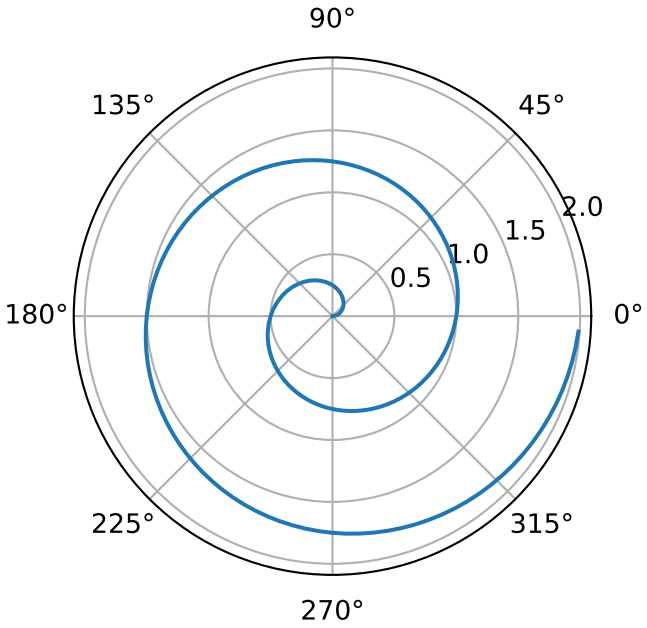


Figure 3.1: A line plot on a polar axis

# 4 Quarto Computations

```
import numpy as np
a = np.arange(15).reshape(3, 5)
a
```

## 4.1 Matplotlib

```
import matplotlib.pyplot as plt

fig = plt.figure()
x = np.arange(10)
y = 2.5 * np.sin(x / 20 * np.pi)
yerr = np.linspace(0.05, 0.2, 10)

plt.errorbar(x, y + 3, yerr=yerr, label='both limits (default)')
plt.errorbar(x, y + 2, yerr=yerr, uplims=True, label='uplims=True')
plt.errorbar(x, y + 1, yerr=yerr, uplims=True, lolims=True,
             label='uplims=True, lolims=True')

upperlimits = [True, False] * 5
lowerlimits = [False, True] * 5
plt.errorbar(x, y, yerr=yerr, uplims=upperlimits, lolims=lowerlimits,
             label='subsets of uplims and lolims')

plt.legend(loc='lower right')
plt.show(fig)
```

## 4.2 Plotly

```
import plotly.express as px
import plotly.io as pio
gapminder = px.data.gapminder()
gapminder2007 = gapminder.query("year == 2007")
fig = px.scatter(gapminder2007,
                 x="gdpPercap", y="lifeExp", color="continent",
                 size="pop", size_max=60,
                 hover_name="country")
fig.show()
```

# References

Knuth, Donald E. 1984. “Literate Programming.” *Comput. J.* 27 (2): 97–111. https://doi.org/10.1093/comjnl/27.2.97.