Computational Physics Homework 1

Daniel Bateman

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1 Abstract

The purpose of this homework is to familiarise myself with numpy and matplotlib by plotting a gaussian distribution, the results of which are reported, and also discuss my background and my goals as they relate to the course.

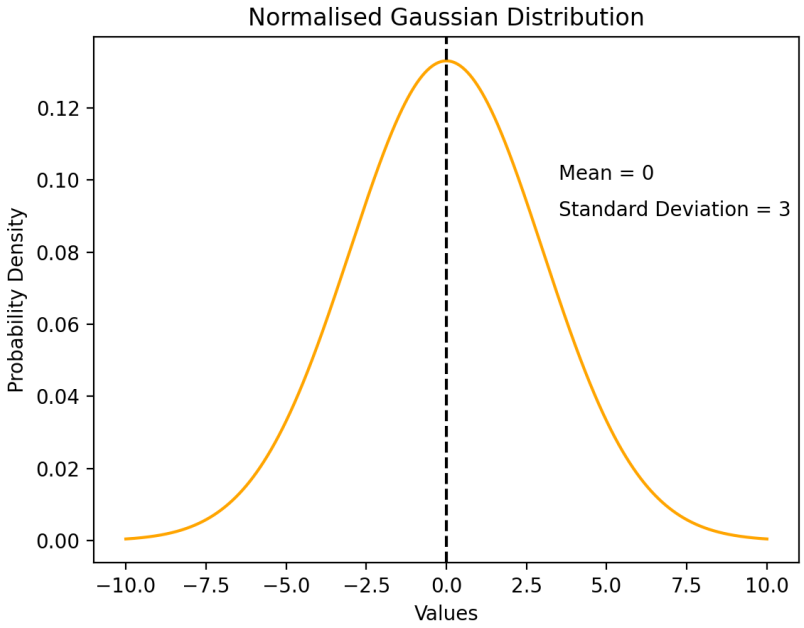
2 Background and Goals

My background in programming amounts to an amateur knowledge in python, on par with that of the average physics undergraduate degree holder. I have taken a couple of computational physics related classes and undertaken a few projects including modelling simple quantum harmonic oscillators and also projectile motion with air resistance but these projects did not require very advanced levels of physics or programming. My plans for after my degree is to move into industry. My goals for this class is to learn sufficient computational skills to get my degree.

3 Method

To plot the gaussian curve I used linspace to create 5000 evenly spaced values between -10 and 10 and then iterating the values into the probability density formula then plotting the values and the iterations against each other. I also added some visual elements that I explored in matplotlib.

4 Results


Normalised Gaussian Distribution
Probability Density
0.00
0.02
0.04
0.06
0.08
0.10
0.12
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
Values
Mean = 0
Standard Deviation = 3