

Physics 2130: Lab 1

Jeremy Favro

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

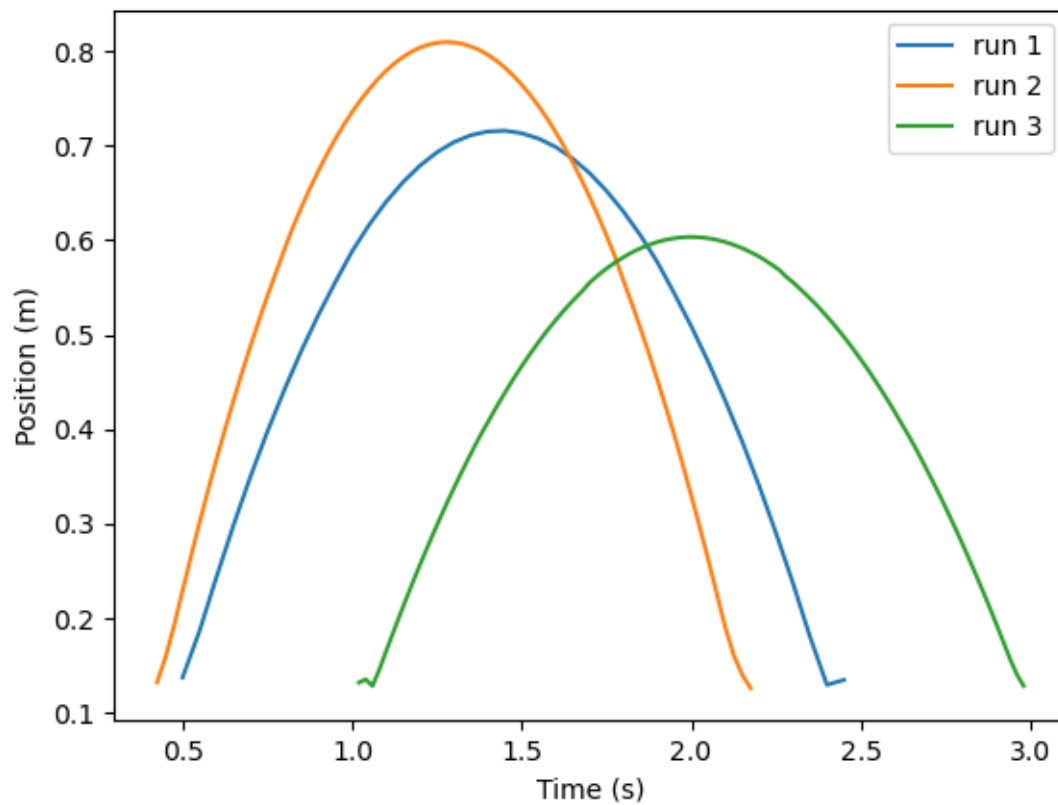
# I <3 avoiding code repetition
def plot_trimmed(path: str, label: str, mintime: float, minpos: float, maxtime: float) ->
    ↪ None:
    data = np.loadtxt(path, delimiter=",", skiprows=1) # does this path syntax work on
    ↪ windows? who knows
    data = data[ (data[:, 0] > mintime) &
    (data[:, 1] > minpos) &
    (data[:, 0] < maxtime)
    ]
    times = data[:, 0]
    positions = data[:, 1]
    pyplot.plot(times, positions, label=label)

plot_trimmed("./data/run1.csv", "run 1", .45, .1, 2.5)

plot_trimmed("./data/run2.csv", "run 2", .4, .1, 2.2)

plot_trimmed("./data/run3.csv", "run 3", 1, .1, 3)

pyplot.xlabel("Time (s)")
pyplot.ylabel("Position (m)")
pyplot.legend()
pyplot.show()
```



The graph shows the expected motion of an object moving up and then back down a ramp. Each run begins with a steep slope and tapers off to zero before starting downwards at a shallow slope which becomes steeper with time. This indicates a constant “downwards” acceleration due to gravity, which is expected. The runs (I believe) differ effectively only in initial velocity with run 3 being the slowest and run 2 the fastest.