PHYS 509C Assignment 3

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Code for this assignment is here:
`https://github.com/callum-mccracken/PHYS-509C-A3`

1 S&P 500

A. Fit a Gaussian with ML

B.

C.

2

how to deal with the correlation thing

3 Supernovae

A. Fit a Gaussian with ML

B.

C.

$$
\begin{aligned}
D &= \frac{1}{H_0}\left(z + \frac{1}{2}z^2(1-q_0)\right) \\
q_0 &= \frac{\Omega_M}{2} - \Omega_\Lambda \\
\Omega_M + \Omega_\Lambda &= 1 : \Omega_M, \Omega_\Lambda > 0 \\
L &= \frac{L_0}{D^2} \\
m &= -2.5\log_{10}(L) \\
\sigma_m &= \pm 0.1
\end{aligned}
$$

Using data file, (col1 = z, col2 = m), find the best-fit and 1σ uncertainty for Ω_Λ.

$$
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D &= \frac{1}{H_0}\left(z + \frac{1}{2}z^2(1-q_0)\right) \\
q_0 &= \frac{\Omega_M}{2} - \Omega_\Lambda \\
\Omega_M + \Omega_\Lambda &= 1 : \Omega_M, \Omega_\Lambda > 0 \\
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m &= -2.5\log_{10}(L) \\
\sigma_m &= \pm 0.1
\end{aligned}
$$

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