# Report - 3

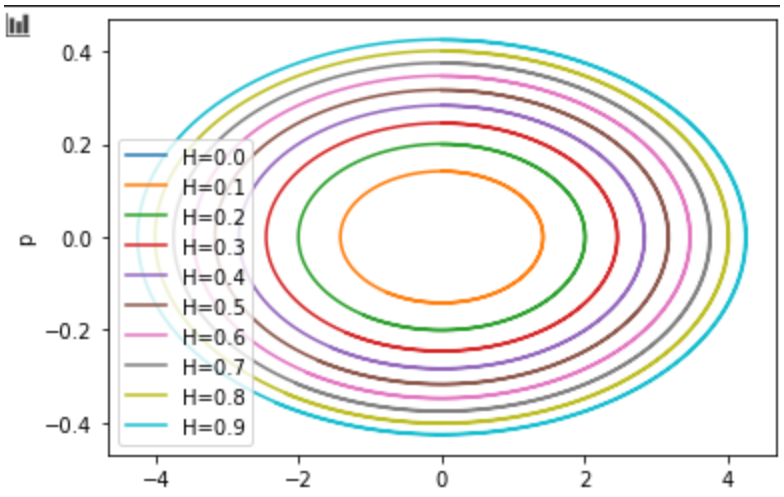
**Derivatives from the hamiltonian**

$H(x,p) = \frac{1}{2}k \cdot x^2 + \frac{p^2}{2m}$

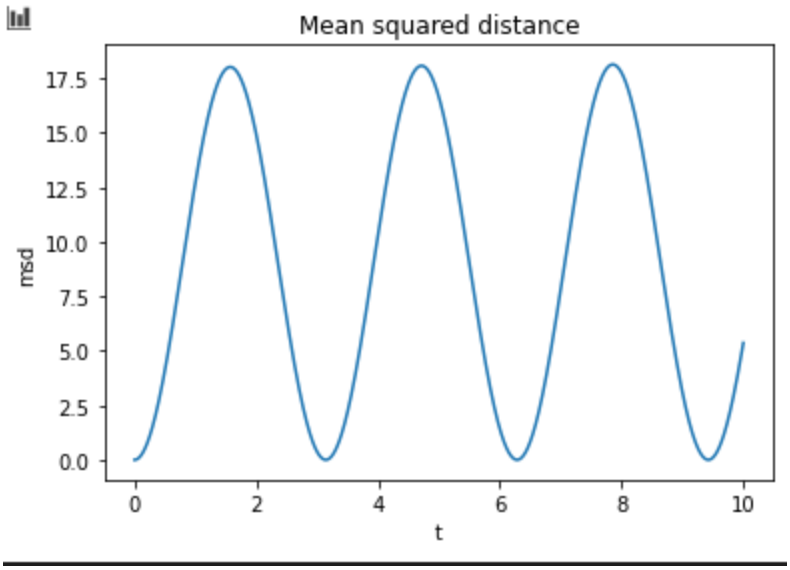
From the Hamiltonian equations,

$\frac{dp}{dt} = -k \cdot x$

$\frac{dx}{dt} = \frac{p}{m}$




Phase space plot for different values of H




Mean squared displacement plot for H=0.9