

# ASTRONOMY 598: MONTE CARLO METHODS HOMEWORK 5

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## CONTENTS

README	1
Running on Hyak	1
Problem 1	2
1a	2
1b	2
1c	2
1d	2
1e	2

## README

This directory contains the code that answers question from homework 5 while this document provides additional content for the same questions. Specifically, `run_hw5.py` code plots the given probability density function and implements the Metropolis algorithm. The script `run_hw5.py` generates the accompanying figures as well. To run, enter `python run_hw5.py`.

## RUNNING ON HYAK

To run the code on Hyak, follow the instructions given below.

- 1) Create an interactive session by entering `qsub -I -l walltime=hr:min:sec` where `hr = 03` is a safe amount of time
- 2) Find your favorite python distribution (2.7+ for this code) using `module avail`
- 3) Load the python distribution via `module load (name of package found using module avail)`. I recommend loading `anaconda.2.4`.
- 4) Run the script by typing `python run_hw5.py`

## PROBLEM 1

The code and figures for all parts are given in the accompanying file. Note: entering `python run_hw5.py` in the terminal will generate all the plots for this homework.

- 1a.** Prior to plotting, I normalized the probability density function. The details of the normalization are given in the comments.
- 1b.** See the code for the Metropolis algorithm implementation.
- 1c.** See the attached 1c.png for the plot.
- 1d.** See the attached 1d.png for the plot.
- 1e.** See the attached 1e.png for the plot.