AST 51 Assignment #1 - Pretty Plots in Python

Task: Create a Jupyter notebook tutorial teaching someone how to create an assigned type of plot in Python.
Professor: David V Martin
Grade amount: 10% of final grade
Given: Thursday Jan 23, 2025
Due date: Thursday Feb 6, 2025 @ 6pm
Early reward: 3% per day for max 2 days, applied multiplicatively (max 100%)
Late penalty: 3% per day with no maximum, applied multiplicatively
Group and plot assignment: On Canvas
Marking metric: Out of 100%

- Clear pedagogy including clearly written English **(40%)**
- Tutorial code successfully produces the appropriate plot to a high degree of sophistication and customization **(40%)**
- Plot obeys standard good plotting practices (e.g. clear axes, appropriate colours and labels, highly visible fonts etc.) **(10%)**
- Code is well commented and explained **(10%)**

Group #	Names	Plot type
1	Vidal, Woodruff, Kropiwnicki	Animations
2	Korkus, Pratt, Birn	Meshgrids
3	Kleanthous, Lam, Robinson	Scatter plots with errorbars
4	Sibley, Carson, Zlotnitsky	Multiple axes and log/linear scales
5	Mahadevan, Donovan, Spejcher	3D plots
6	Lamardo, Mercera, Pandina	Subplots (including weird ones)
7	Zapanta, Banks, Dahleen	Annotations (text, lines, legends, math fonts)
8	Edelman, Dy, Reeves	Plotting spreads (e.g. box and whisker)
9	Lindsay, Truex, Nguyen	Histograms
10	English, Broni, Mengkeat	Filled plots

FAQ

Who is the target audience of this notebook? The other students in the AST-51, i.e. people who have at least some but not necessarily a lot of python knowledge, and potentially zero knowledge about the type of plot you are
What do we hand in? Each group will hand in **ONE** tutorial notebook. There is no minimum or maximum length, but it should be sufficient to teach someone with minimal coding knowledge not only how to make a certain type of plot but it should teach them to understand the code that produces the plot. The tutorial should also allow the user to be able to customize their plots.

What will happen with the assignment? All assignments will be published on Canvas as a knowledge bank for the rest of the class. Your assignments will not be made accessible to the public without your permission.
How is this graded? Everyone in a group will receive the same mark, barring cases of insufficient contribution
What if I fall ill or other unforeseen circumstances? Communicate with me! I am here to support you.
How is plagiarism and insufficient contribution handled? Every student must hand in a signed (e-signature is fine) document where in a couple of sentences they state their original contribution to the project and a rough assessment of the distribution of work amongst the group. This will be anonymous. This document is on Canvas. In addition, several times throughout the year students will be randomly interviewed to discuss their assignment with the TA and to demonstrate their knowledge of the code's working.
Am I expected to understand the entire submission? Yes, you should understand the entire submission, even if you largely worked on a certain section of it.
What is the punishment for insufficient contribution? If it is believe you have made an insufficient contribution to the extent that you do not properly understand the submitted assignment, you may be asked to do either an additional coding task (to reinforce the lessons of the assignment) or, in extreme cases, asked to do the assignment again on your own. Ultimately, we are all adults and will be treated as such. But we also want to have assessment that is fair and with integrity. Violations could result in reduced individual or group marks or other disciplinary action.
How do we hand this in? ALL students must hand in the aforementioned "integrity form" but only one student per group (could be any) needs to hand in the actual assignment. If multiple students in a group hand in the assignment I'll consider the first one, unless otherwise told. All of this will be on Canvas.
How are late/early marks applied? They are applied multiplicatively. If your base score is 70% but you handed it in 2 days early, then you'd receive 70 * 1.06 = 74.2%. If you handed it in 3 days late then you'd receive 70 * 0.91 = 63.7%. In terms of timing, if you hand in within 24 hours of the due date, that is considered "on time", i.e. no early or late marks. Between 24 and 48 hours before the due date = 1 day early, so a 3% early award, and so on… Within 24 hours after the due date = 1 day late, 24-48 hours = 2 days, etc…
Can I ask the teacher/TA/rest of the class for help? Absolutely. Whilst your first port of call should be to discuss/ask your teammates, you are always encouraged to come to office hours and post on Slack. We won't do the assignment for you but we'll happily assist you.
The requirements seem fairly open-ended, how will I know when we have done enough? Look at the marking criteria carefully as a first step. Consider yourself a student in this class trying to learn a type of plotting tool. Imagine you had your own tutorial as a resource. Would it allow you to not only **create** these plots but **understand** how they work? If so, you've probably done "enough". You are also welcome to ask the professor/TA for advice on this matter.
Can I program using a different language? No, using python 3 is required as it is an astronomy "industry standard" that we'd all do well to learn, even if you already know another language.

Can we include downloaded packages? Yes, but any package needs to contain clear instructions for both its installation and use. Any packages should also be ones that are common and themselves well-documented and well-supported. We don't want to teach people to use something that won't work in 6 months time.

Should the Jupyter notebook run? Yes, it should run on Python 3.8. If you require any packages, it should be clear what needs to be downloaded.

Can I turn in a .py script instead of a Jupyter notebook? No, whilst the use of .py scripts is common, for consistency of grading and the fact that Jupyter notebooks are worth learning, we require them. Jupyter notebooks are also very popular for tutorials, like the one you are writing

Can I incorporate code that I found online? Realistically, astronomers use StackExchange, Github and in general Google a lot. This is fine in moderation, as long as it is documented. Ultimately, to obtain full marks the code submitted should illustrate that you a) know how to write sophisticated code and b) know what each line of the code is doing.

Can I use ChatGPT? As a tool that helps you learn, e.g. finding bugs in your code, sure. However, you cannot use ChatGPT to write the whole assignment (it'll be pretty obvious and a pretty poor result). Remember that the coding part of this assignment is only one aspect; many marks are awarded for the pedagogy. And finally, we are all here to learn, so keep that in mind…

Can we be inspired by tutorials we see online? Inspired, for sure! Copied, no.