George's Quick Start Guide to SageMath

Use this guide to help you get started quickly with SageMath.

There are two ways to use SageMath: (1) on your computer, (2) and online.

- **Your Computer** – Using SageMath on your computer requires downloading and installing the software and its components by going to www.sagemath.org. My guide does not discuss this method because it can be quite involved and complicated. Downloading and installing SageMath on your computer is not the quickest way to start using SageMath. My recommended method is online as discussed below.

- **Online** – There are two options for using SageMath online:
  - ***SageMathCell*** – Go to sagecell.sagemath.org. Here you can just type in a SageMath command into the "cell" and click the *Evaluate* button to see the result. For example, copy and paste the following code into the cell **ellipse((0,0),2,1)** then scroll down to see the ellipse plot.
    - Advantages of *SageMathCell:*
      - Allows you to quickly enter a SageMath command.
      - You do not need to log in to an online account to use SageMath (unlike with *CoCalc* as explained below).
    - Disadvantages of *SageMathCell:*
      - You must be already familiar with SageMath (and Python) syntax to enter a command.
      - Any code you run is not saved on the server.
  - ***CoCalc*** – Go to cocalc.com to create a free account. This website is administered by the developer of SageMath and it allows you to use the software and other tools for free.
    - Advantages of *CoCalc:*
      - You have more coding options than with just the basic *SageMathCell.*
      - Your code is saved on *CoCalc's* servers so you can work with it at a later login.
      - You create "Projects" with various tools, and only a few are listed below:
        - Sage Worksheet – This is SageMath's own file where you can enter, run, and save SageMath commands. However, their website notes the following:
          - *"The legacy SageNB is still a powerful web app, and has some advantages, but is no longer under active development, so we recommend that new users start with the Jupyter notebook."*
        - Jupyter Notebook – This is a separate product which is a front-end SageMath add-on. Even as standalone product, *Jupyter Notebook* is a popular free tool used for numerical simulation, data visualization, and more.
        - JupyterLab – This is the latest version of *Jupyter Notebook* and is recommended for entering, running, and saving SageMath code on *CoCalc.*
    - Disadvantages of *CoCalc:*
      - You have to log in to your online *CoCalc* account. This is hardly a disadvantage but with *SageMathCell* you do not have to log in at all.

- **Python** – A high-level general-purpose programming language that emphasizes code readability. *SageMath, Jupyter Notebook,* and *JupyterLab* all use Python for coding mathematics. Therefore it is recommended that you at least learn the basics of Python programming.