# Workshop Cheat Sheet

## Overview

This cheat sheet is a guide to help you when you get stuck. Start by seeking inspiration, then look for prompt and prompt engineering help. If that doesn't work, review the actual code to use in the Jupityr notebook.

## Tips

* Treat it like a person: If GPT-4 makes a great figure (e.g., for race), try to keep it on the same subject. Make all related figures back-to-back to utilize its memory function best.
* Multiple related figures: You can request multiple related figures in one prompt. For example:  
  Can you make a bar chart for the number of participants in each condition and another one for the number of unique studies per condition?
* Fixing issues: If GPT-4 provides a figure with some issues, it's easy to point out what went wrong and ask for corrections. Often, it will fix the issues without manual code edits. If you have Python knowledge, you can also identify and point out errors for it to fix.
* Organize your work: For each figure you generate, create a new cell in Jupyter to keep your work organized and to selectively run them.

## [Link to figures for reference](https://drive.google.com/drive/folders/1ld-Cka3oSJ1ShkMbg4SgN1TaEYQNdzP_?usp=drive_link)

## Example Figures Checklist (in order of difficulty)

* Number of participants per condition (bar)
* Number of studies per condition (bar)
* Race of subjects (bar)
* Gender (pie chart)
* Ethnicity (bar chart)
* Assay methods (bar)
* Biosample types (bar)
* Age distribution(bar)
* Any of the above but pie charts
* Two-dimensional stacked bar charts:  
  - Ethnicity and race  
  - Gender by conditions  
  - Assay methods and conditions  
  - Biosample type and conditions  
  - Race and conditions  
  - Assay methods and race  
  - Age group by race  
  - Age group by condition  
  - Condition by clinical trial participants
* Donut plots (e.g., difference in the number of participants per condition vs. number of studies)

## Prompt Engineering Help

### Number of Participants/Studies per Condition (Bar)

Can you make a bar chart for the number of participants in each condition and another one for the number of unique studies per condition?

### Race of Subjects Chart

Can you make a bar chart for the different races of the subjects?

### Race Pie Chart

Can you make a pie chart of the distribution of the subjects' races?  
- Note: The pie chart may look cluttered if some races have very small amounts. Provide feedback to label only significant parts (e.g., Black, Asian, White) and include others in the legend.

-Use this template to make other pie charts

### Gender Pie Chart

Make a pie chart for the gender distribution of the subjects.

### Ethnicity Bar Chart

Make a bar chart for the ethnicity distribution of the subjects.

### Assay Methods Bar

Make a bar chart for the assay method distribution of the subjects.  
- Note: Ensure the data is split based on semicolons. If there is an issue, instruct to split by semicolons.

### Biosample Types Bar

Make a bar chart for the biosample type distribution of the subjects.  
- Same note as above for assay methods.

### Age Distribution Bar

Make a bar chart for the age distribution of the subjects.

Note: Here you can tell it to make custom groups, so for ex you could have it cluster in 10s, 5s, or any custom age ranges of your choice.

### Ethnicity and Race

Can you make a stacked bar chart of the ethnicity data with races colored?  
- Alternative: Race by ethnicity.

### Gender by Conditions

Can you make a stacked bar chart of the gender data with conditions colored?

### Assay Methods and Conditions

Can you make a stacked bar chart of the assay method data with the different conditions colored?

### Biosample Type and Conditions

Can you make a stacked bar chart of the biosample type data with the different conditions colored?

### Race and Conditions

Can you make a stacked bar chart of the race data with the different conditions colored?

### Assay Methods and Race

Can you make a stacked bar chart of the assay method data with the different races colored?

### Age Group by Race

Can you make a stacked bar chart of the age data, making age groups (customizable), with the different races colored?

### Age Group by Condition

Can you make a stacked bar chart of the age data, making age groups (customizable), with the different conditions colored?

### Condition by Clinical Trial Participants

Can you make a stacked bar chart of the participants per study data, coloring the participants involved in a clinical trial?

### Donut Plots

I want to make a donut plot which has one circle of the donut dedicated to the number of participants per condition and another circle for the number of studies per condition.  
- Note: Provide secondary prompts to clean up messy figures.