mass_breakdown

February 4, 2025

```python
[3]: from GalaxyMass import ComponentMass
```

```python
[4]: import pandas as pd
     import numpy as np
```

```python
[5]: galaxies = ["MW", "M31", "M33"]
```

```python
[6]: def get_values(gal_name: str):
         fp = f"../../Data/{gal_name}_000.txt"

         dm_halo_mass = ComponentMass(fp, 1)
         disk_mass = ComponentMass(fp, 2)
         bulge_mass = ComponentMass(fp, 3)

         total_mass = dm_halo_mass + disk_mass + bulge_mass
         total_stellar_mass = disk_mass + bulge_mass
         f_bar = total_stellar_mass / total_mass

         return dm_halo_mass, disk_mass, bulge_mass, total_mass, total_stellar_mass,
     ↪f_bar
```

```python
[16]: # make table of values
      data = {
          "Galaxy Name": [],
          "Halo Mass (1e10 Msun)": [],
          "Disk Mass (1e10 Msun)": [],
          "Bulge Mass (1e10 Msun)": [],
          "Total Mass (1e10 Msun)": [],
          "f_bar": [],
      }
      for gal in galaxies:
          dm_halo_mass, disk_mass, bulge_mass, total_mass, total_stellar_mass, f_bar
      ↪= (
              get_values(gal)
          )
          data["Galaxy Name"].append(gal)
          data["Halo Mass (1e10 Msun)"].append(dm_halo_mass / 1e10)
          data["Disk Mass (1e10 Msun)"].append(disk_mass / 1e10)
```

```python
    data["Bulge Mass (1e10 Msun)"].append(bulge_mass / 1e10)
    data["Total Mass (1e10 Msun)"].append(total_mass / 1e10)
    data["f_bar"].append(f_bar)


# create dataframe from dictionary
df = pd.DataFrame(data)

# to latex and save that as a pdf
df.to_latex("test.tex", index=False, float_format="%.2f")
```

Galaxy Name	Halo Mass (1e10 Msun)	Disk Mass (1e10 Msun)	Bulge Mass (1e10 Msun)	Total Mass (1e10 Msun)	f_bar
MW	197.4925 solMass	7.5 solMass	1.0005 solMass	205.993 solMass	0.041266
M31	192.088 solMass	12.0 solMass	1.904997 solMass	205.992997 solMass	0.0675023
M33	18.6613 solMass	0.93 solMass	0.0 solMass	19.5913 solMass	0.0474701