AUTHOR: Saad Abdullah

Importing all required libraries.

```
import pandas as pd
import matplotlib.pyplot as plt
```

Loading the Histogram Data.

```
file_path = "results.csv"
data = pd.read_csv(file_path)
data.head(10)
```

	Bin	Omega	HistogramDD	HistogramDR	HistogramRR
0	0.00-0.25	2.365399	2350856	396662	1140716
1	0.25-0.50	1.744417	4356416	1183132	2673438
2	0.50-0.75	1.418153	5589018	1946030	4058226
3	0.75-1.00	1.215410	6483428	2673818	5272688
4	1.00-1.25	1.086647	7323414	3384896	6389408
5	1.25-1.50	1.002047	8173756	4079235	7468356
6	1.50-1.75	0.936981	8985512	4759594	8468506
7	1.75-2.00	0.884503	9790048	5439828	9434062
8	2.00-2.25	0.845757	10643558	6118655	10332756
9	2.25-2.50	0.810945	11408330	6763049	11201850

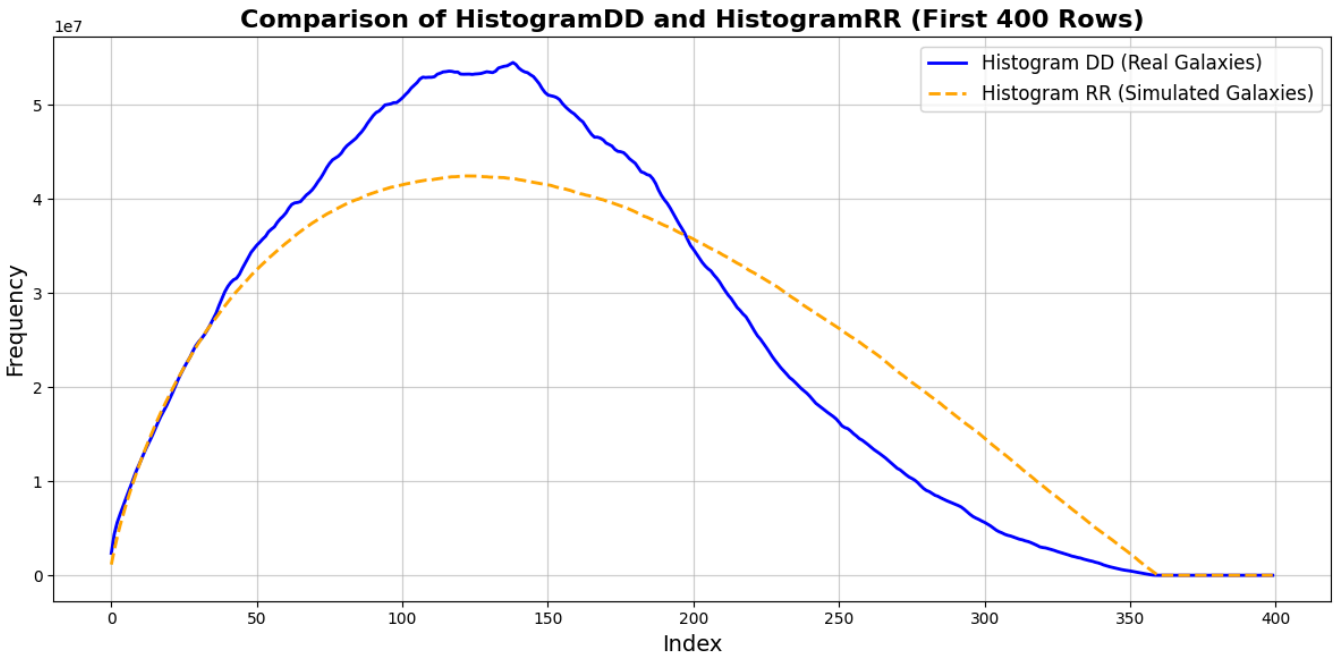
Next steps: Generate code with data | View recommended plots | New interactive sheet

Data Selection

```
# Since all values are after 90 degrees so created a subset for better visualization.
data = data.head(400)
index = data.index
omega = data['Omega']
histogramDD = data['HistogramDD']
histogramRR = data['HistogramRR']
```

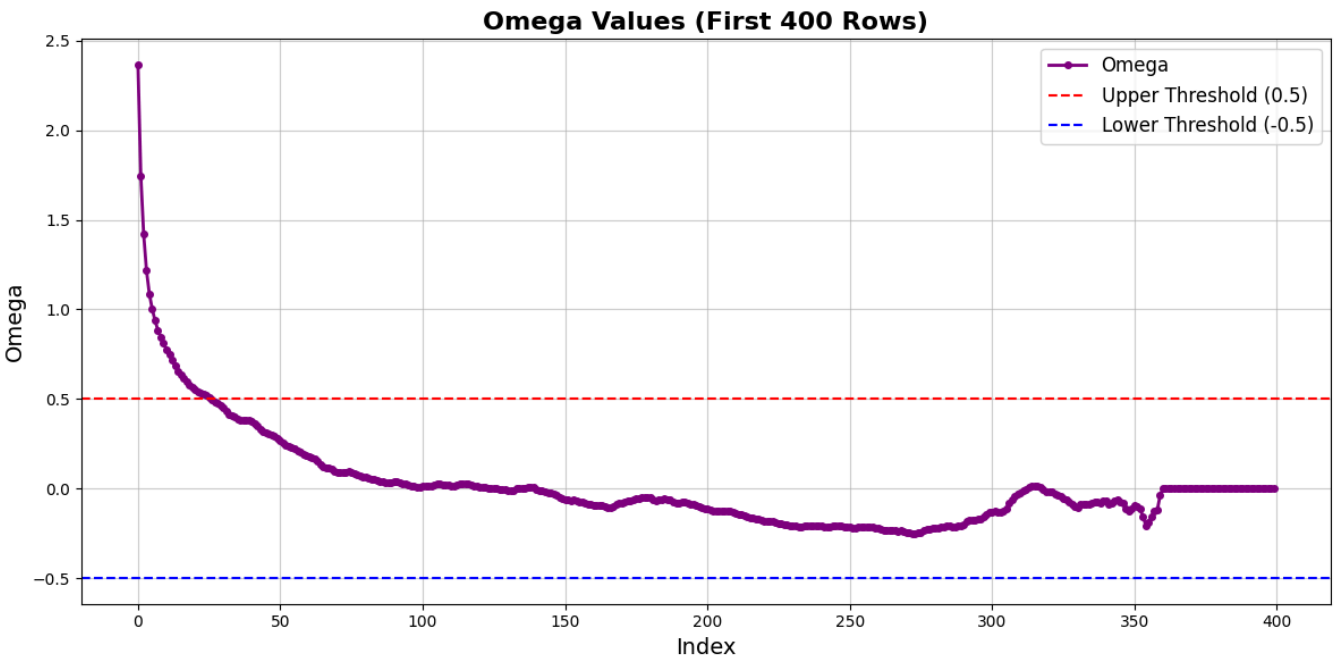
Histogram

```
plt.figure(figsize=(12, 6))
plt.plot(index, histogramDD, label="Histogram DD (Real Galaxies)", color="blue", linewidth=2)
plt.plot(index, histogramRR, label="Histogram RR (Simulated Galaxies)", color="orange", linestyle="--", linewidth=2)
plt.title("Comparison of HistogramDD and HistogramRR (First 400 Rows)", fontsize=16, fontweight="bold")
plt.xlabel("Index", fontsize=14)
plt.ylabel("Frequency", fontsize=14)
plt.legend(fontsize=12)
plt.grid(True, alpha=0.6)
plt.tight_layout()
plt.show()
```



Plot for Omega values

```
plt.figure(figsize=(12, 6))
plt.plot(index, omega, label="Omega", color="purple", marker="o", linewidth=2, markersize=4)
plt.axhline(0.5, color="red", linestyle="--", linewidth=1.5, label="Upper Threshold (0.5)")
plt.axhline(-0.5, color="blue", linestyle="--", linewidth=1.5, label="Lower Threshold (-0.5)")
plt.title("Omega Values (First 400 Rows)", fontsize=16, fontweight="bold")
plt.xlabel("Index", fontsize=14)
plt.ylabel("Omega", fontsize=14)
plt.legend(fontsize=12)
plt.grid(True, alpha=0.6)
plt.tight_layout()
plt.show()
```



Summary

To the best of my knowledge, The analysis highlights strong clustering of real galaxies at smaller separations, which fades into a random distribution at larger angular separations.