Life beyond Earth.

Team members:

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Github:

https://github.com/Saahil87/2021Fall_finals

Datasets:

1. Observed Exoplanets database: http://phl.upr.edu/projects/habitable-exoplanets-catalog/data/database
2. Potentially Habitable Exoplanets database: http://phl.upr.edu/projects/habitable-exoplanets-catalog
3. Extremophile's survival conditions: https://www.frontiersin.org/files/Articles/447668/fmicb-10-00780-HTML-r2/image_m/fmicb-10-00780-t004.jpg

Overview:

Life beyond the Earth has always been a fascinating quest for scientists. Roughly 12% out of an approximate 5000 exoplanets have been found to be in the "habitable zone [1]" in our observed universe, yet there exists a question on whether these planets could actually host life. At the same time there are organisms on earth – the extremophiles, that can survive under extreme conditions these exoplanets [2] have to offer. Our study analyzes these planets and examines the survival rate of extremophiles [3] on these planets.

Here are the hypotheses we found fit to explore extremophiles on exoplanets:

1. Hypothesis 1: Approximately 12% of the confirmed exoplanets are in the habitable zone of their systems, hence they possess Earth-like conditions.
2. Hypothesis 2: If any of the exoplanets possesses similar conditions in which an Extremophile can survive, then those planets could potentially host life.

We will be considering these parameters while working on these hypothesis:

1. Temperature range of Extremophiles
2. Pressure range of Extremophiles
3. Planet mass in earth units of an observed exoplanet
4. Flux in earth units of an observed exoplanet
5. Temperature in earth units of an observed exoplanet
6. Revolution Period in days of an observed exoplanet

References:

1. http://phl.upr.edu/projects/habitable-exoplanets-catalog
2. https://iopscience.iop.org/article/10.3847/1538-4357/aae36a/meta

[1] Habitable Zone - the orbital region around a star in which an Earth-like planet can possess liquid water on its surface and possibly support life.

[2] Exoplanets - Planets that orbit around other stars are called exoplanets.

[3] Extremophiles - a microorganism, that lives in conditions of extreme temperature, acidity, alkalinity, or chemical concentration.