

Kamand Premier League '19

Hackathon

1 Rules of the event

- Use of internet is allowed.
- You may use standard packages and software like numpy, pandas, matplotlib and scipy for data handling and plotting if required.
- You need to submit/showcase your answers in the form of an application. Teams are required to create a GitHub repository with title “KPL19_<TeamName>” and share the link with the organisers.
- Your answers will be given credit on two criteria (the exact objective marking scheme will be provided after the event)-
 - The offset of your answer from the actual answer; some questions/sub-parts will be graded on a binary scheme.
 - Some credit is assigned for crucial data processing steps in relevant questions.
- Comment your code in brief. Display any calculations and the approach used through the code since it determines some partial credit.

2 Problem Statement

1. Sir Swapnil the Stud has left his hostel on 15th May 21:00 IST. He plans to play a game where he randomly selects a Star ID, X, and points the telescope to the 5 stars that seem closest to X from outside his hostel. Help him out by giving him the coordinates to point the telescope for a given Star ID given to the app.
2. Bhavya Bhatt has derived a function to calculate distance modulus assuming values for dark energy and dark matter content of the Universe using General Relativity because he was bored.
 - a. Depict this relationship by plotting the apparent wavelength vs distance modulus of extragalactic sources .
 - b. Print all sources that lie within the Milky Way
3. STAC is planning on purchasing a new telescope that is capable of resolving sources that have been almost completely dimmed by Milky Way dust. Print 5 objects that Ananya can only now see using this.

3 Data parameters

Column 1 - Star ID

Column 2- Right Ascension

Column 3- Declination

Column 4- Galactic longitude

Column 5- Galactic latitude

Column 6- Spectroscopic redshift

Column 7- Photometric redshift

Column 8- Uncertainty in the photometric redshift

Column 9: Distance (modulus) calculated from the photometric redshift since this redshift is given for all objects.

Column 10- E (B-V) Color Index of the source