Code Explanation

1. **Class Flare:** All methods are stored inside a class named flare. This class initializes the flare detection procedures. The methods used inside the course are:

    -   **read_file:** This method checks the format of the input file and extracts the information in a panda dataframe, and calls other class methods which extract the information of flare detected.

    -   **utc_to_met:** It converts the string date input(of format dd-mm-yyyy , mm-dd-yyyy and yyyy-mm-dd) to DateTime data type for further evaluations.

    -   **Uniforming:** It is used to remove the large data gaps from the input dataset.

    -   **Rebinning:** This operation is used to change the scale of the time axis by averaging out values for a given range. E.g., Changing the scale for one observation from 1 second to 60 seconds.

    -   **Test_decay_equation:** Decay equation in power-law function, used for evaluating end time of the flare.

    -   **Test_linear and Test_polynomial:** These two functions were initially used to evaluate flare start time. However, later on, we used numpy.polyfit for its evaluation for better results.

    -   **Fit_curve_first_half_linear , Fit_curve_first_half_polynomial** : These functions were initially used for evaluation flare_start_time, They uses Test_linear and Test_polynomial functions and scipy.optimize.curve_fit evaluation of flare time parameter

    -   **Fit_curve_later_half:** This function uses the test_decay_equation process and scipy.optimize.curve_fit for evaluating parameters that are later used to evaluate flare end time.

    -   **Flare_locations:** this function calculate:
        -   the position of points from where the flare is starting

- The average value of background flare
- The peak value, the peak time of flare
- Classifies all flares in different types(i.e A,B,C,M,X)
- Position of point where flare is ending.
- Plots the curve of flares. With different colors representing different classes of flares.

- FLOW OF CODE :

  INPUT → __main__ → read_file → utc_to_met → uniforming → binning → flare_location → Fit_curve_later_half → Test_decay_equation → flare_location → read_file → __main__ → OUTPUT