1. Data set:

   Facing some difficulties of searching real-time constellation image with label from the internet and getting inspired by a thread on StackExchange, i decided to generate my own dataset using the website below. It is feasible to generate my own dataset since all the star patterns are well labelled.
   https://stellarium-web.org

2. Methodology:
   a. Data processing:

      Since the goal of the project is for constellation detection, all data will be mainly extracted from the StellarumWeb under the 'constellation' mode. Screenshots with the label of the name of the constellation taken from different angles will be captured and provided as input to the program. The dataset may need to normalize if the data obtained has a wide range.

   b. Machine learning model:

      The different shape of the constellation should be classified from the dataset and the expectation of the program is that given a picture of the star pattern, it should be able to correctly classify the constellation by displaying its name to the user.
      For this project, CNN model is proposed to be applied for this image classification project, since the program is expected to learn a function for a categorical output, i.e. the picture provided to the program is going to be classified and matched to one out of 88 constellations. This model allows a clear classification and an absolute output for every input image. However, the potential problem is that the program may not be able to distinguish a non star pattern object over a star pattern object, i.e. all input images will be matched to one constellation name, therefore it may lose the ability for generalization.

      Regression model is not very suitable for this project since the output, the name of the constellation is not continuous. Therefore, regression model is not very helpful in this case.

   c. Evaluation Metric:

      For this image classification project, accuracy, precision, recall, f1 score, confusion matrix and RUC can be used to analyze.

   d. Final conceptualization:

      The final project is expected to be delivered in the form of a mobile app for better visualization.