

Part 1

- Imagine that you are an art collector who has accumulated many pictures, each of them has been valued and has a price in pounds.
- You are running out of storage space and you have decided to give away 50 of your pictures.
- You have two friends Anne and Bob, and you want to split your pictures fairly between them.
- Fair here means that the total value of the pictures given to Ann and Bob should be similar. The number of pictures each receives can be different, but the total value each receives should be as close as possible.
- Your task is to formulate this problem as an optimisation problem and solve it using a heuristic search method.

Questions and Programming Tasks

1.1 Solution Representation and Objective Function

[Note: for each answer in text form the Maximum Word Count: is 100 max]

- Describe in text form how you will encode a potential solution to this problem (ie the data structure), and what this encoding represents.
- Describe in text form what will be a good metric to quantify the quality of a candidate solution to the problem.

1.2 Heuristic Search Method

- Implement a heuristic search method to solve this problem.

1.3 Experimental Results

- Run experiments with your implemented method and report the results obtained using both numerical metrics and plots.

Part 2

Questions and Programming Tasks

[Note: each answer in text form is very brief here: up to 10 words.]

2.1 Manufacturers and Rating

- Compare the distribution of cereal ratings by manufacturer
- What is the manufacturer with the highest average rating?
- Use quantitative metrics and plots to answer this question.

2.2 Features as Predictors of Rating

- What are the cereal (numerical) features that are stronger predictors of cereal rating?
 - How do the top features relate to rating (positively i.e., an increase in them increase the rating; or negatively, ie. an increase in them decrease the rating)?
 - Use a machine learning method, metrics and plots to answer these questions.
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