WRAPPER METHODS

GREEDY ALGORITHMS

WRAPPER METHODS

- Greedy search algorithms

- Utilise a specific classifier to select the optimal set of features

- Sequential feature selection algorithms add or remove one feature at the time based on the classifier performance until a feature subset of the desired size k is reached, or any other desired criteria is met

WRAPPER METHODS

- Step Forward feature selection algorithms begin from no feature and add one at a time

- Step backwards feature selection begins from all the features and removes one feature at a time

- Exhaustive feature selection tries all possible feature combinations

Step Forward

Step Backward

Exhaustive

STEP FORWARD FEATURE SELECTION

Evaluates all subsets of 1 feature

Chooses the one that provides best algorithm performance

Evaluates all subsets of 2 features (the first selected and another)

Evaluates algorithm performance

Repeats until criteria is met

STEP BACKWARD FEATURE SELECTION

| Evaluates all features first | Removes 1 feature and evaluates algorithm performance | Removes second feature and measures performance | Removes third feature and evaluates performance | Repeats until criteria is met |

EXHAUSTIVE FEATURE SELECTION

- Makes all possible feature combinations from 1 to n = total features.

- And selects the one that provides best performance.
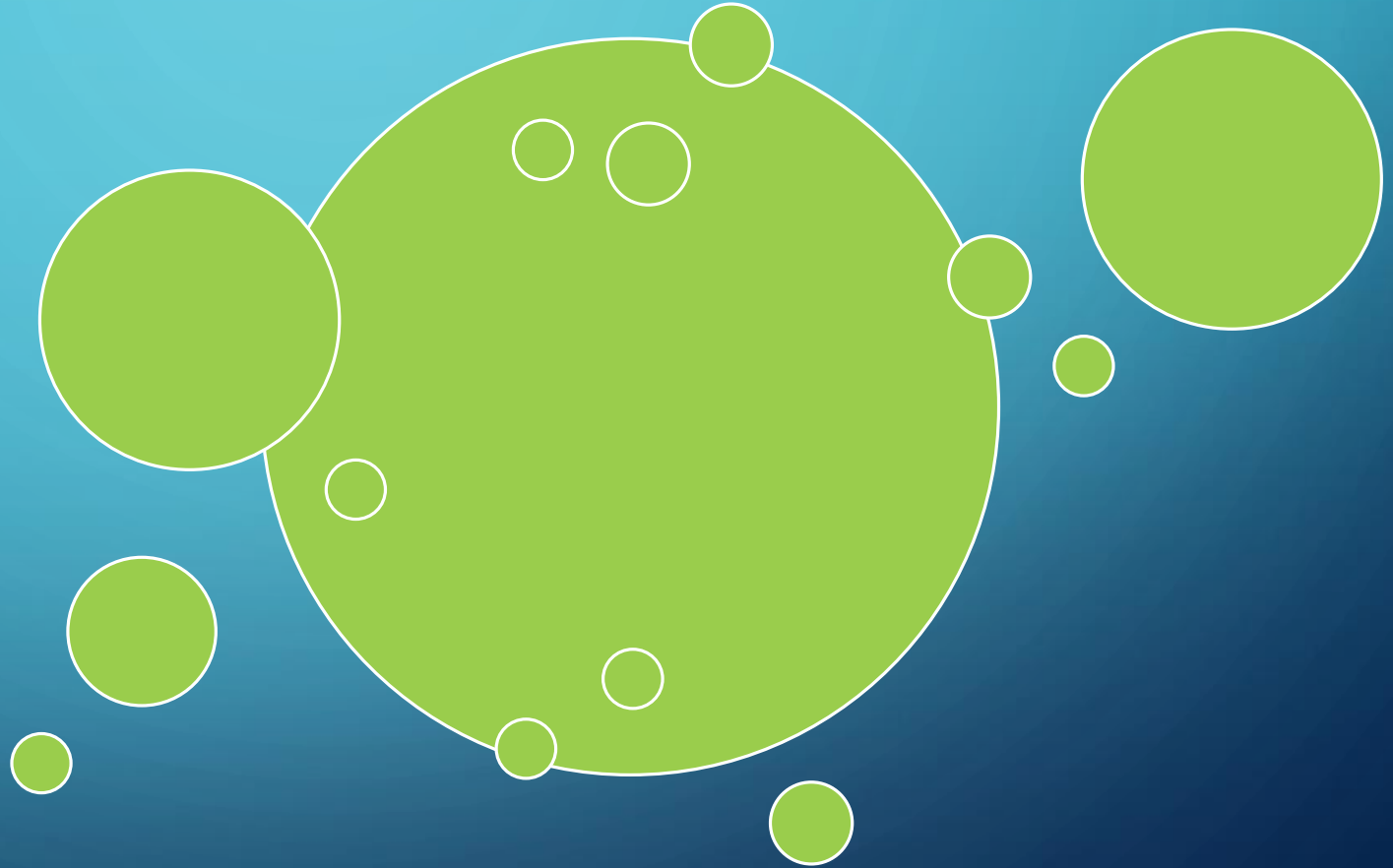
GREEDY SEQUENTIAL ALGORITHMS

- Extremely computationally expensive

- Often not feasible due to number of features in dataset

- Feature space optimised for a specific algorithm

- Should provide the highest performance