Train In Data

One Sided Selection

One Sided Selection

The idea is to retain observations from the majority that are hard to classify, but remove the noise.

One Sided Selection

- First, selects samples at the boundary of the classes (hardest instances).
- Next, removes the Tomek Links (noise)

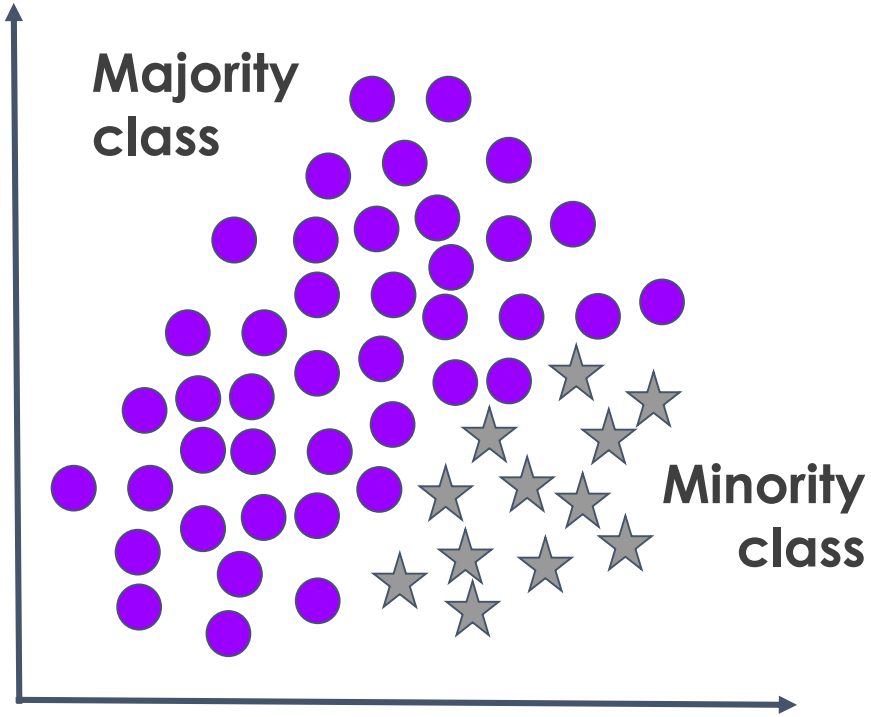
One Sided Selection

- Cleaning
- Final dataset shape varies
- Boundary matters

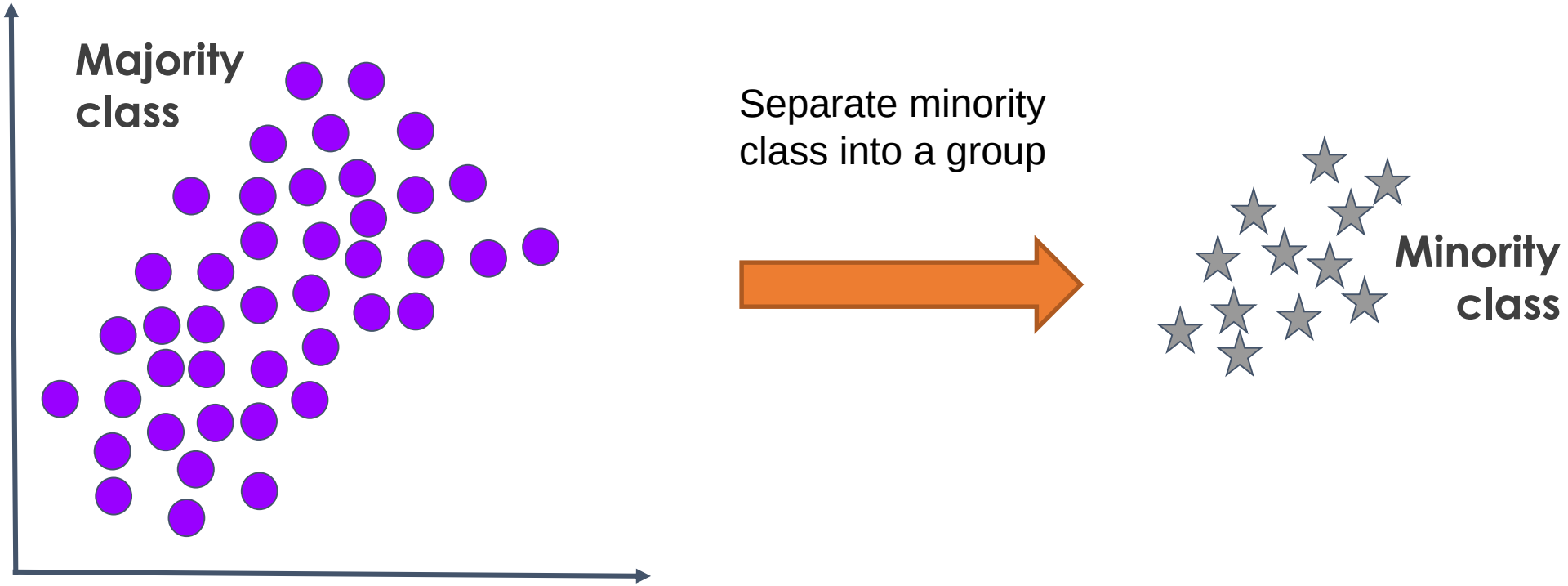
One Sided Selection: Procedure

1. Create group S with all samples from minority
2. Add 1 observation from the majority to S (at random)
3. Train a 1-KNN on S
4. Make predictions on the rest of the majority class observations
5. If predictions don't match the class, pass the samples to S
6. In S, find and and remove Tomek Links

One Sided Selection



One Sided Selection



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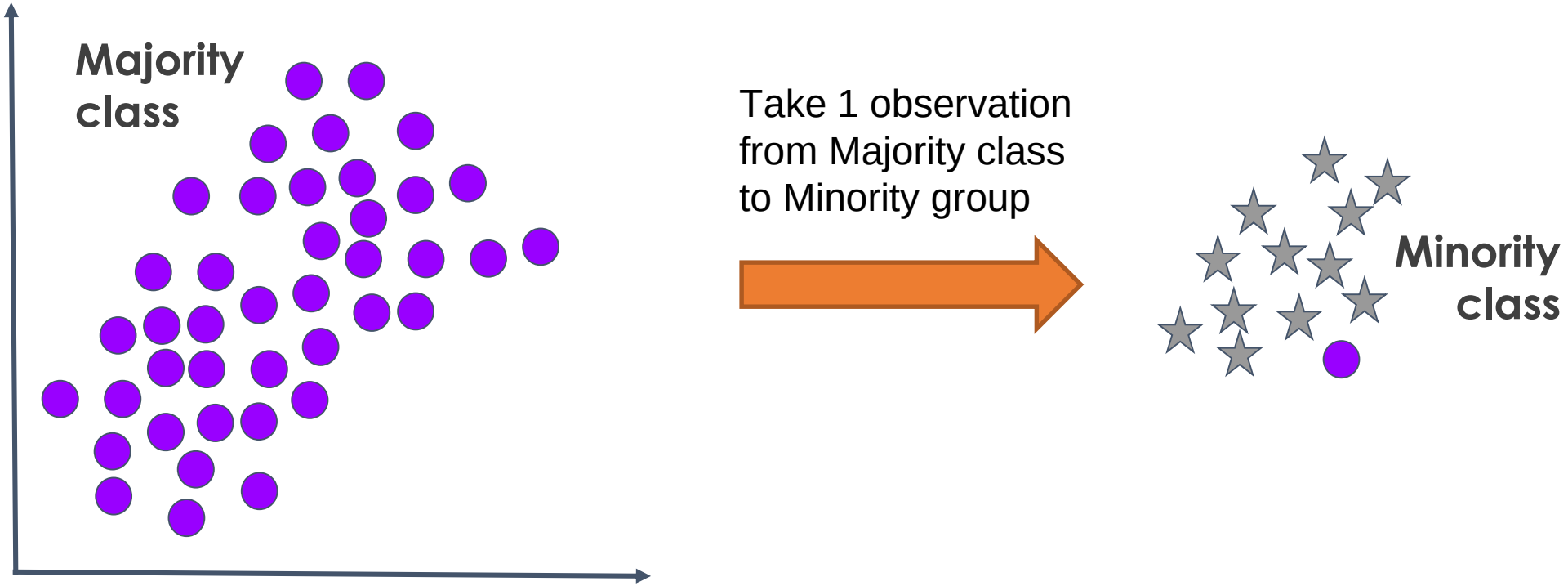
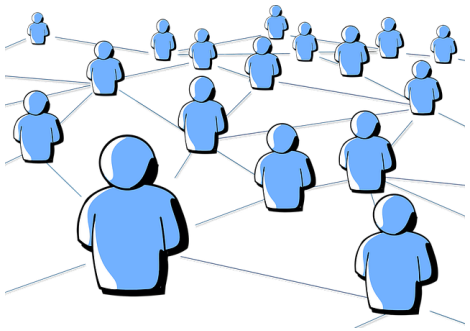


One Sided Selection

Train a 1 KNN algorithm



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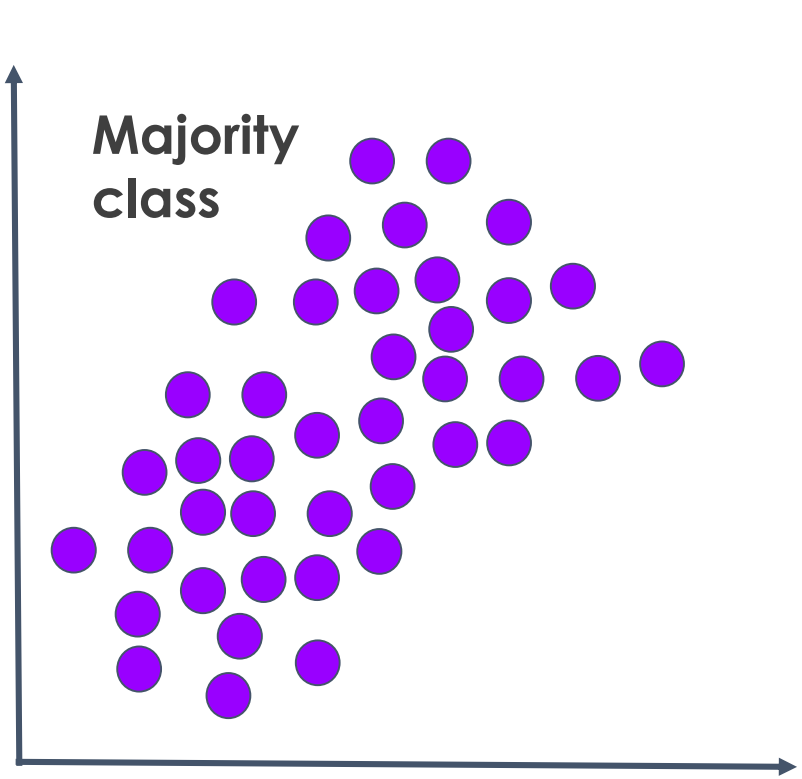
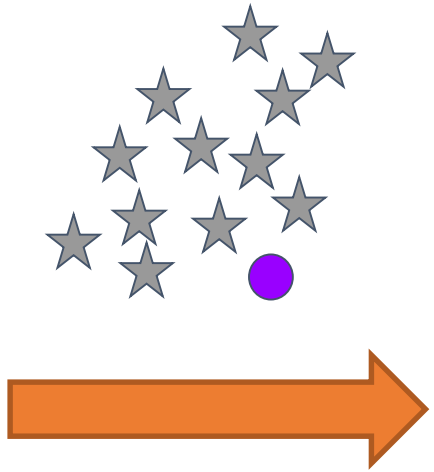
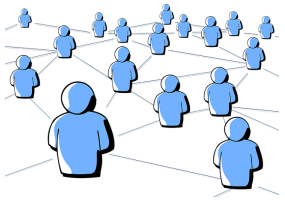
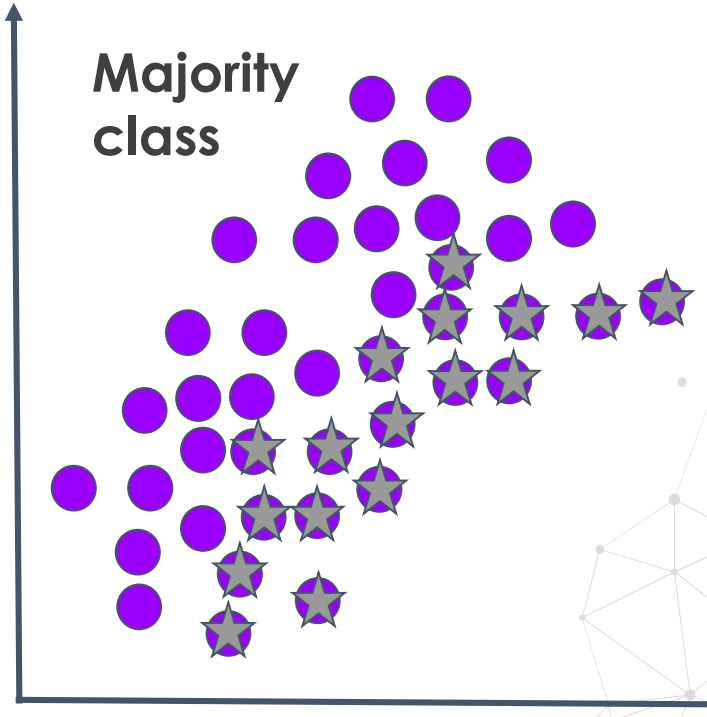


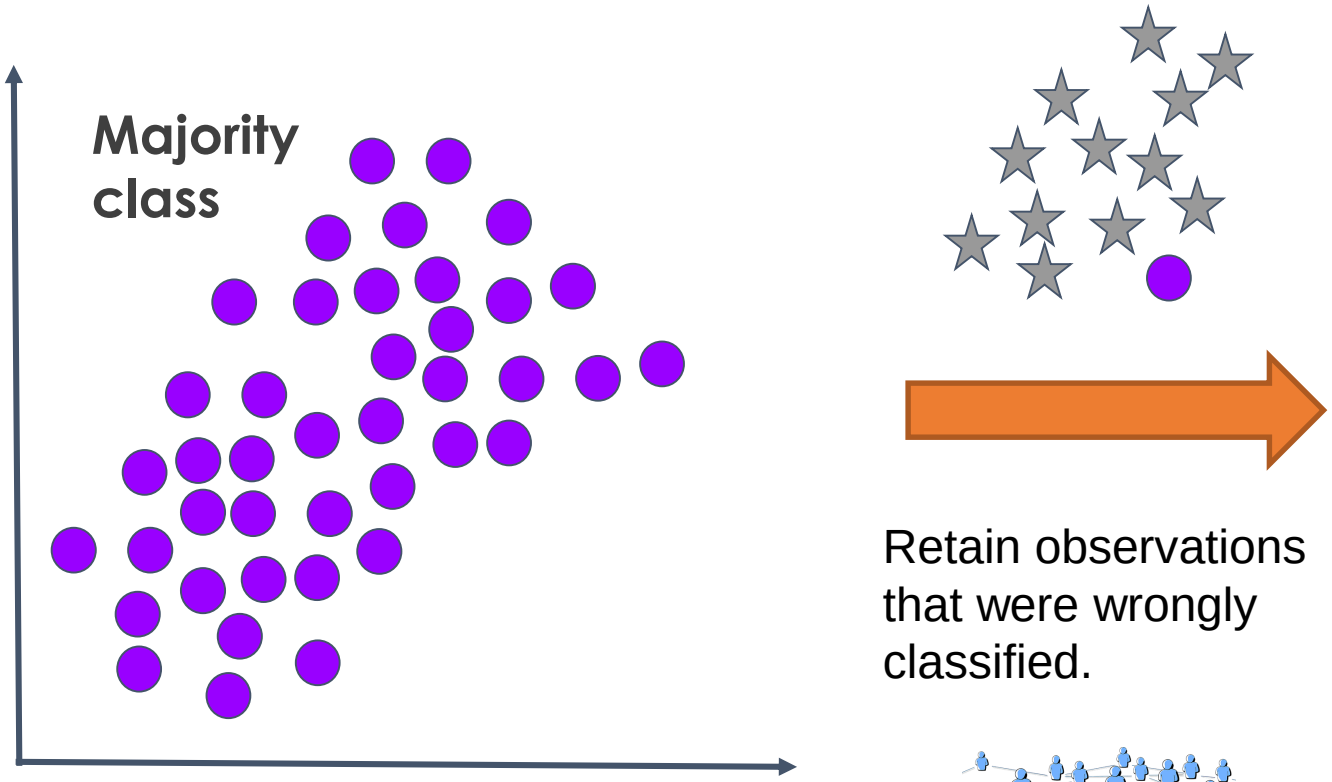


Use KNN to classify observations from majority class.

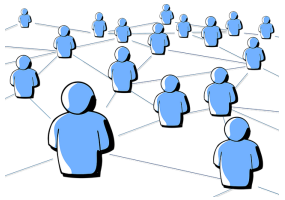


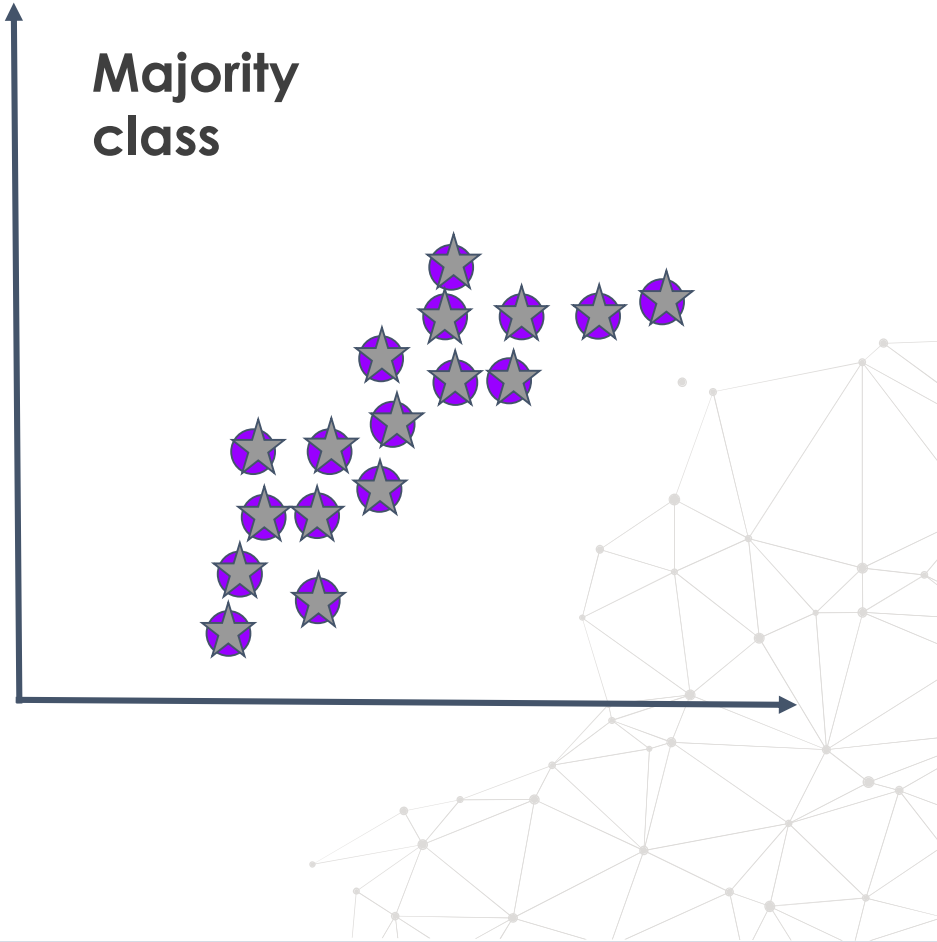


One Sided Selection



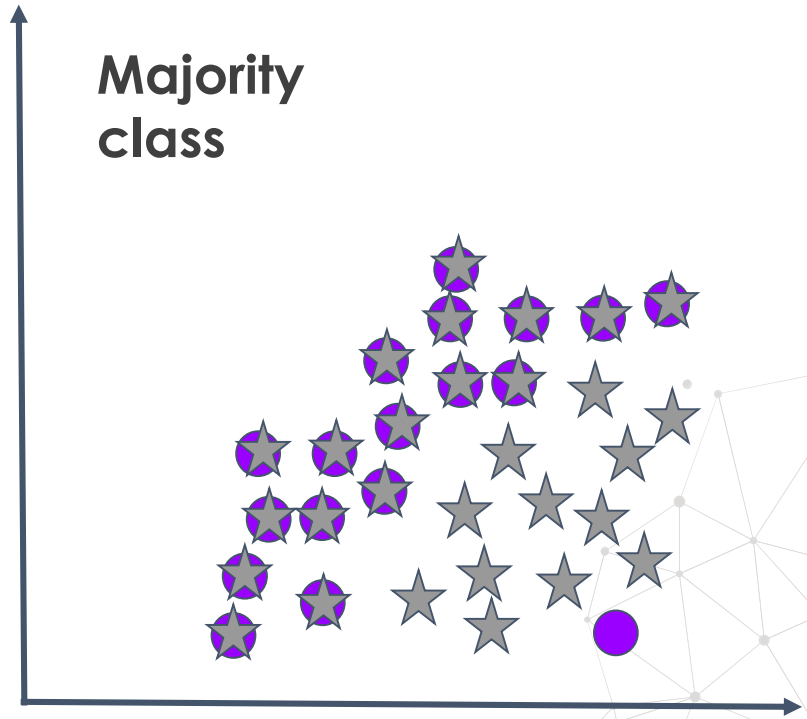
Retain observations that were wrongly classified.





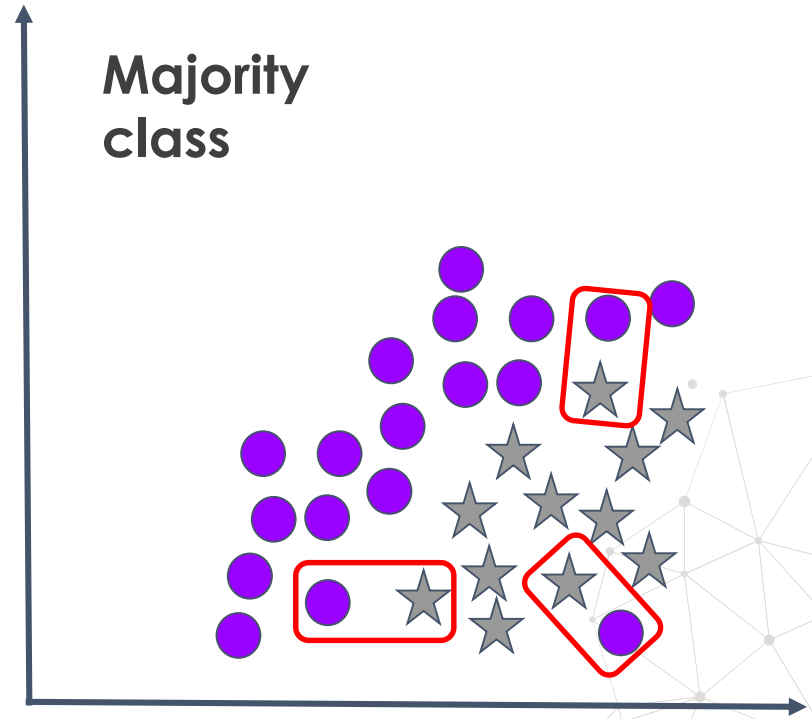
One Sided Selection

Resampled data consists of the minority group + those observations wrongly classified.



One Sided Selection

With the resampled data, find and remove the Tomek Links.



One Sided Selection

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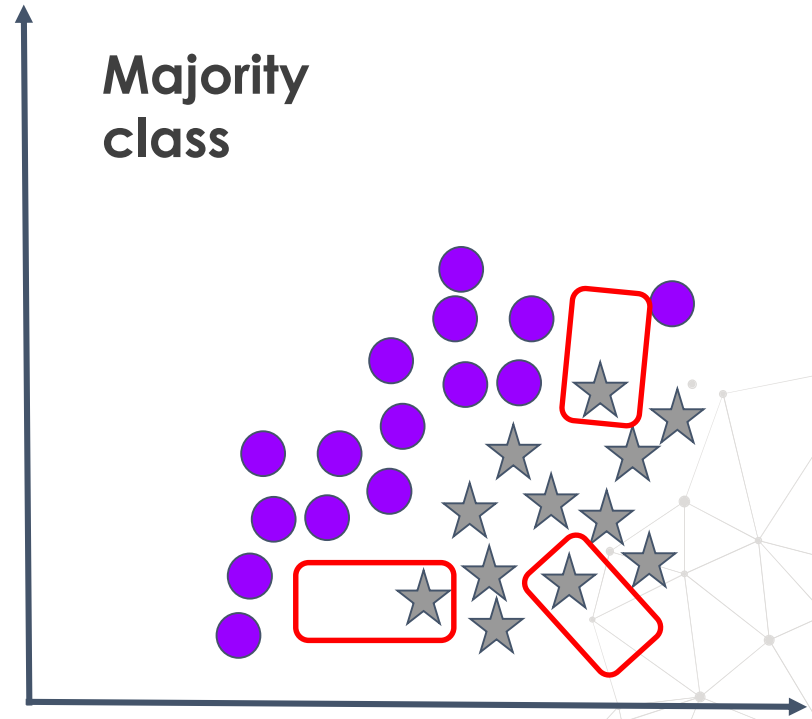
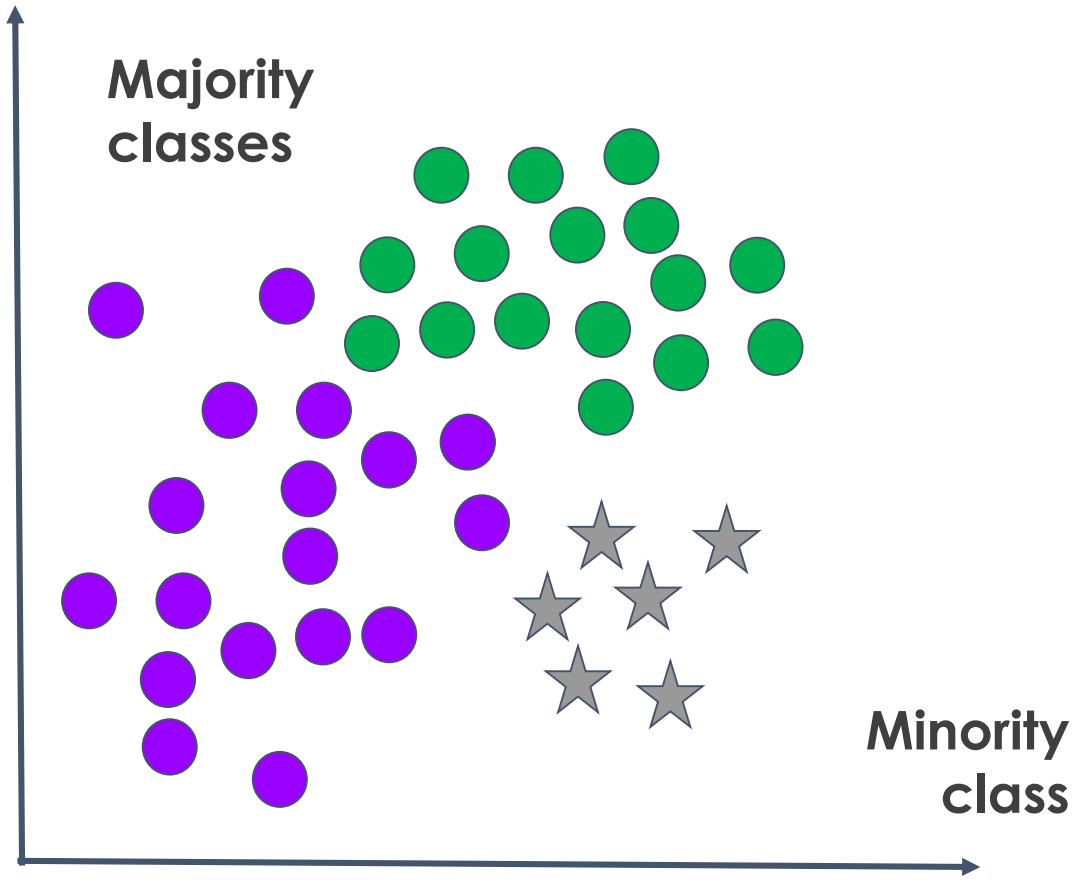


Imbalanced-learn: OSS

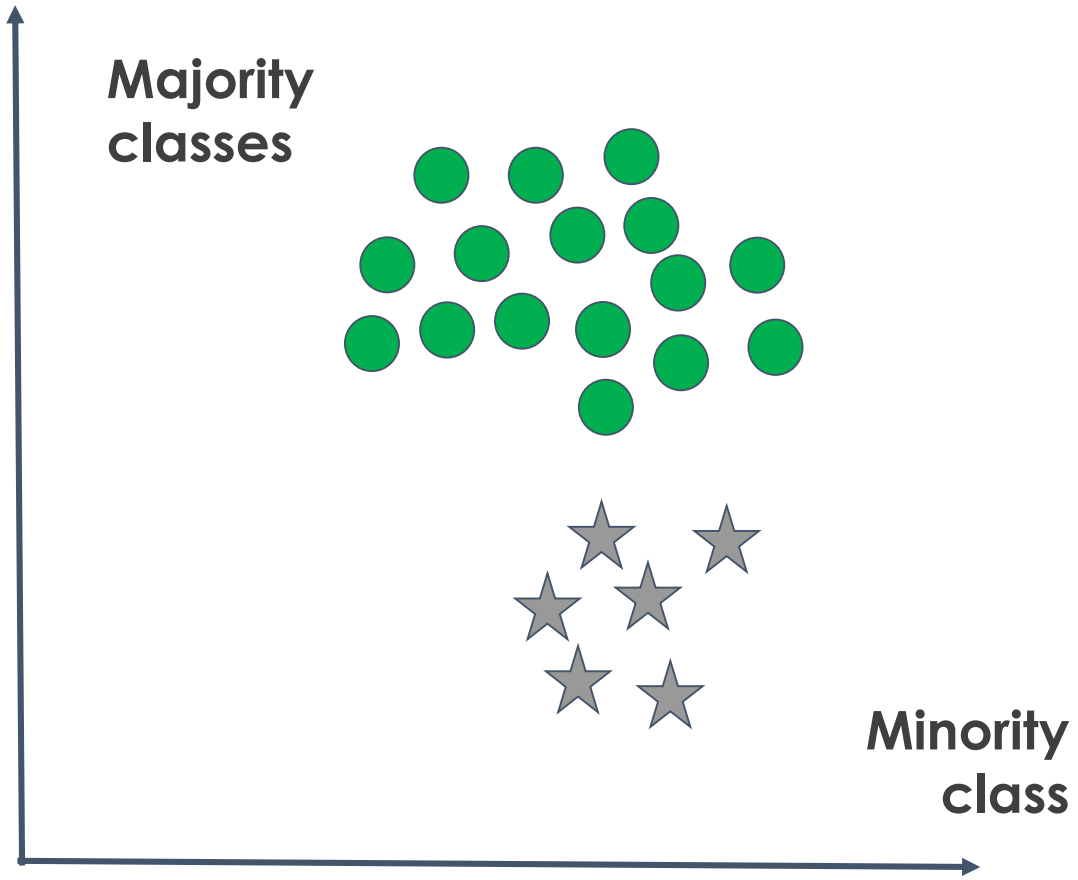
```
# create data

X, y = make_data(sep=2)

# set up OSS

oss = OneSidedSelection(
    sampling_strategy='auto',  # undersamples only the majority class
    random_state=0,  # for reproducibility
    n_neighbors=1,# default
    n_jobs=4)  # I have 4 cores in my laptop

X_resampled, y_resampled = oss.fit_resample(X, y)
```

Multi-class



One vs One.

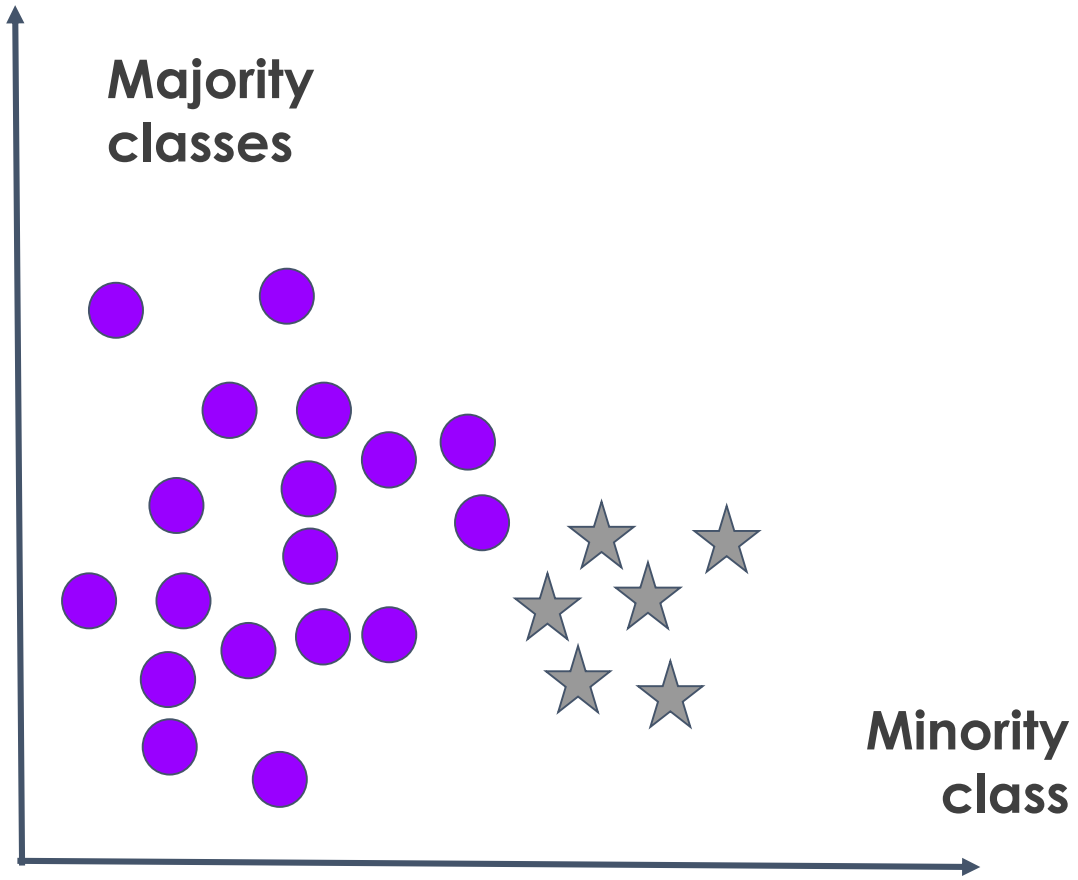
Multi-class



One vs One.

Run entire procedure over 1 majority class first

Multi-class



One vs One.

Repeat the procedure for the other majority class.

Train In Data

THANK YOU

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