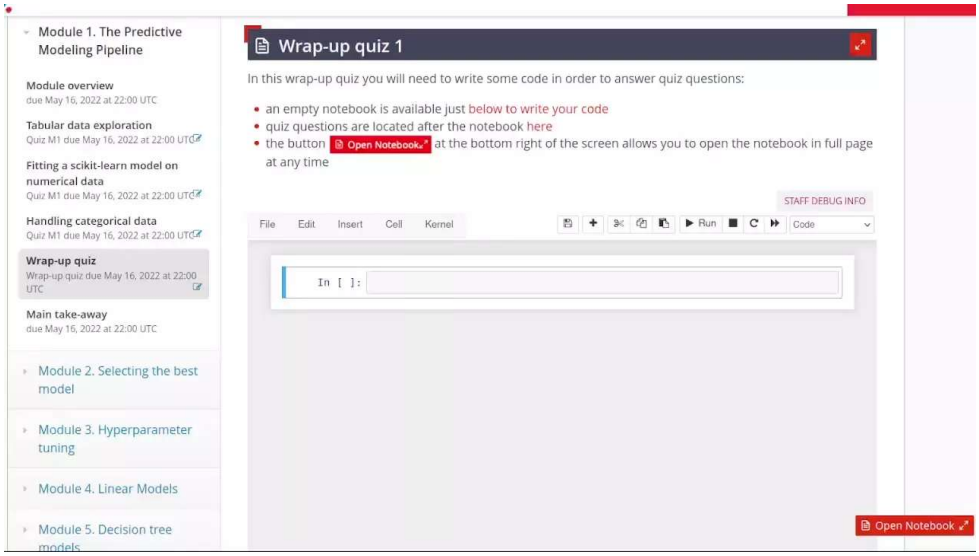
Wrap-up quiz 1

In this wrap-up quiz you will need to write some code in order to answer the quiz questions:

- an empty notebook is available just below to write your code
- quiz questions are located just after the notebook here
- the button Open Notebook at the bottom right of the screen allows you to open the notebook in full page at any time

+ Demo video of the notebook user interface



Open Notebook

Module 7 - Wrap Up

Importing Pandas

In [1]:
```
import pandas as pd
```

Loading Dataset

In [16]:
```
ames_housing = pd.read_csv("../datasets/ames_housi

target_name = "SalePrice"
data, target = ames_housing.drop(columns=target_na
```

We did not encounter any regression problem yet. Therefore, we convert the regression target into a classification target to predict whether or not an house is expensive. "Expensive" is defined as a sale price greater than $200,000.

In [17]:
```
target = (target > 200_000).astype(int)
```

EDA

In [4]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1460 entries, 0 to 1459
Data columns (total 79 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   MSSubClass     1460 non-null   int64
 1   MSZoning       1460 non-null   object
 2   LotFrontage    1460 non-null   float64
 3   LotArea        1460 non-null   int64
 4   Street         1460 non-null   object
 5   Alley          1460 non-null   object
```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Open the dataset `ames_housing_no_missing.csv` with the following command:

```
target_name = "SalePrice"
data, target = ames_housing.drop(columns=target_name),
ames_housing[target_name]
target = (target > 200_000).astype(int)
```

`ames_housing` is a pandas dataframe. The column "SalePrice" contains the target variable.

We did not encounter any regression problem yet. Therefore, we convert the regression target into a classification target to predict whether or not an house is expensive. "Expensive" is defined as a sale price greater than $200,000.

Question 1 (1/1 point)

Use the `data.info()` and `data.head()` commands to examine the columns of the dataframe. The dataset contains:

- a) only numerical features
- b) only categorical features
- c) both numerical and categorical features

You have used 1 of 1 submissions

Question 2 (1/1 point)

How many features are available to predict whether or not a house is expensive ?

- a) 79
- b) 80

You have used 1 of 1 submissions

Question 3 (1/1 point)

How many features are represented with numbers?

- [ ] a) 0
- [x] b) 36
- [ ] c) 42
- [ ] d) 79

Hint: You can use the method `df.select_dtypes` or the function `sklearn.compose.make_column_selector` as shown in the notebook.

You have used 1 of 1 submissions

Question 4 (1/1 point)

Refer to the dataset description regarding the meaning of the dataset.

Among the following columns, which columns express a quantitative numerical value (excluding ordinal categories)?

- [x] a) “LotFrontage”
- [x] b) “LotArea”
- [ ] c) “OverallQual”

- [x] e) “YearBuilt”

✔

Select all answers that apply

You have used 1 of 2 submissions

We consider the following numerical columns:

```
numerical_features = [
  "LotFrontage", "LotArea", "MasVnrArea", "BsmtFinSF1", "BsmtFinSF2",
  "BsmtUnfSF", "TotalBsmtSF", "1stFlrSF", "2ndFlrSF", "LowQualFinSF",
  "GrLivArea", "BedroomAbvGr", "KitchenAbvGr", "TotRmsAbvGrd",
"Fireplaces",
  "GarageCars", "GarageArea", "WoodDeckSF", "OpenPorchSF",
"EnclosedPorch",
  "3SsnPorch", "ScreenPorch", "PoolArea", "MiscVal",
]
```

Question 5 (1/1 point)

Now create a predictive model that uses these numerical columns as input data. Your predictive model should be a pipeline composed of a `sklearn.preprocessing.StandardScaler` to scale these numerical data and a `sklearn.linear_model.LogisticRegression`.

What is the accuracy score obtained by 10-fold cross-validation (you can set the parameter `cv=10` when calling `cross_validate`) of this pipeline?

- [ ] a) ~0.5
- [ ] b) ~0.7
- [x] c) ~0.9

Instead of solely using the numerical columns, let us build a pipeline that can process both the numerical and categorical features together as follows:

- the `numerical_features` (as defined above) should be processed as previously done with a `StandardScaler`;
- the left-out columns should be treated as categorical variables using a `sklearn.preprocessing.OneHotEncoder`. To avoid any issue with rare categories that could only be present during the prediction, you can pass the parameter `handle_unknown="ignore"` to the `OneHotEncoder`.

What is the accuracy score obtained by 10-fold cross-validation of the pipeline using both the numerical and categorical features?

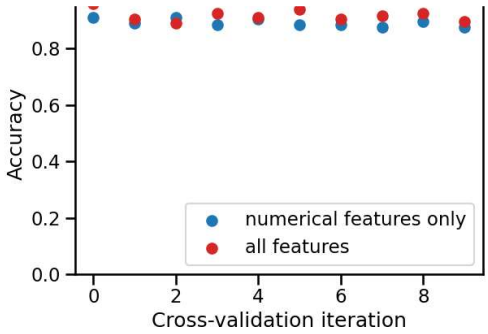
- a) ~0.7
- b) ~0.9
- c) ~1.0

You have used 1 of 1 submissions

Question 7 (1/1 point)

One way to compare two models is by comparing their means, but small differences in performance measures might easily turn out to be merely by chance (e.g. when using random resampling during cross-validation), and not because one model predicts systematically better than the other.

Another way is to compare cross-validation test scores of both models fold-to-fold, i.e. counting the number of folds where one model has a better test score than the other. This provides some extra information: are some partitions of the data making the classifaction task particularly easy or hard for both models?



Select the true statement.

The number of folds where the model using all features perform better than the model using only numerical features lies in the range:

- a) [0, 3]: the model using all features is consistently worse
- b) [4, 6]: both models are almost equivalent
- c) [7, 10]: the model using all features is consistently better

You have used 1 of 1 submissions

YOUR EXPERIENCE

According to you, the 'Wrap-up Quiz' of this module was:

- **Too easy, I got bored**
- **Adapted to my skills**
- **Difficult but I was able to follow**
- **Too difficult**

Submit

To answer this wrap-up quiz, I spent:

- **less than 30 minutes**

- ○ **2 to 4 hours**
- ○ **more than 4 hours**
- ○ **I don't know**

Submit

FORUM (EXTERNAL RESOURCE)

There are no more M1. Wrap-up quiz 1 topics. Ready to start a new conversation?

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