Pelatihan
Microcredential
CERTIFICATION
Associate Data Scientist
1 November - 30 Desember 2021

Hands-On

Materi ini di diterjemahkan oleh Kelompok Penerjemah Kecerdasan Data Kominfo 2021.

Pertemuan 5

Pada pertemuan ini kita akan belajar bagaimana cara melakukan Eksplorasi Data menggunakan Kaggle, Melakukan Data Wrangle melalui Dataset

Pengambilan Data dari API Kaggle

Salah satu portal yang menyediakan dataset untuk proses Data Science adalah Kaggle (https://www.kaggle.com/). Pada kelas ini, dimana proses mengunduh dataset dilangsungkan lewat fitur Kaggle Command line tool. Ini artinya, yang dibutuhkan adalah API Authentication Kaggle.

A. Install Kaggle

```
!pip install kaggle
!mkdir -p ~/.kaggle
!cp kaggle.json ~/.kaggle/
!ls ~/.kaggle
!chmod 600 /root/.kaggle/kaggle.json
!kaggle competitions list -s titanic
```

```
Requirement already satisfied: kaggle in /usr/local/lib/python3.7/dist-packages (1.5.12)
Requirement already satisfied: tqdm in /usr/local/lib/python3.7/dist-packages (4.62.3)
Requirement already satisfied: python-dateutil in /usr/local/lib/python3.7/dist-packages (2.8.2)
Requirement already satisfied: requests in /usr/local/lib/python3.7/dist-packages (2.23.0)
Requirement already satisfied: six >= 1.10 in /usr/local/lib/python3.7/dist-packages (1.15.0)
Requirement already satisfied: certifi in /usr/local/lib/python3.7/dist-packages (2021.10.8)
Requirement already satisfied: slugify, slugify in /usr/local/lib/python3.7/dist-packages (4.0.1)
Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/dist-packages (1.24.3)
Requirement already satisfied: python-slugify >= 4.0.0 in /usr/local/lib/python3.7/dist-packages (5.0.2)
Requirement already satisfied: requests-oauthlib >= 0.7.0 in /usr/local/lib/python3.7/dist-packages (1.3.0)
Requirement already satisfied: text-unidecode >= 1.3 in /usr/local/lib/python3.7/dist-packages (1.3)
Requirement already satisfied: oauthlib >= 3.0.0 in /usr/local/lib/python3.7/dist-packages (3.1.1)
Requirement already satisfied: chardet, idna in /usr/local/lib/python3.7/dist-packages (2.10)
mkdir: cannot create directory '/root': File exists
chmod: cannot access '/root/.kaggle/kaggle.json': No such file or directory
ref                                            deadline             category            reward  teams    
-----------------------------------------------  -------------------  ------------------  ------  -----  
titanic                                        2030-01-01 00:00:00  Getting Started     Kudos   7614  
house-prices-advanced-regression-techniques    2030-01-01 00:00:00  Getting Started     Kudos   4884  
imagenet-object-localization-challenge         2029-12-31 07:00:00  Research            Kudos     50  
digit-recognizer                               2030-01-01 00:00:00  Getting Started     Kudos   2257  
nlp-getting-started                            2030-01-01 00:00:00  Getting Started     Kudos    966  
gan-getting-started                            2030-01-01 00:00:00  Getting Started     Kudos    251  
connectx                                       2030-01-01 00:00:00  Simulation          Kudos    154  
jigsaw-toxic-comment-classification-challenge  2023-12-31 07:00:00  Code               Swag    1352  
jigsaw-unintended-bias-in-toxicity-classification  2019-12-09 07:00:00  Code               Swag    1311  
mercari-price-suggestion-challenge             2018-02-05 07:00:00  Code               Swag    2384  
jane-street-market-prediction                  2021-03-18 07:00:00  Code               Swag     1039  
rsna-intracranial-hemorrhage-detection         2019-10-30 07:00:00  Code               Swag     1345  
siim-covid19-detection                         2021-11-29 07:00:00  Code               Swag      346  
iwildcam-2019-fgvc6                            2019-04-30 07:00:00  Code               Swag      157  
iwildcam-2020-fgvc7                            2020-05-14 07:00:00  Code               Swag      151  
plant-pathology-2020-fgvc7                     2020-05-29 07:00:00  Code               Swag      271  
plant-pathology-2021-fgvc8                     2021-05-31 07:00:00  Code               Swag      215  
siim-acr-pneumothorax-segmentation             2019-09-02 07:00:00  Code               Swag      351  
histopathologic-cancer-detection               2019-03-30 07:00:00  Code               Swag      1895  
aerial-cactus-identification                   2021-03-31 07:00:00  Code               Swag      1887  
aptos2019-blindness-detection                  2019-09-23 07:00:00  Code               Swag      1928  
dogs-vs-cats-redux-kernels-edition             2019-01-07 07:00:00  Code               Swag      1314  
human-protein-atlas-image-classification       2019-02-11 07:00:00  Code               Swag      1149  
jigsaw-multilingual-toxic-comment-classification  2020-11-30 07:00:00  Code               Swag      1204  
open-images-object-detection-rvc-2020          2020-12-31 07:00:00  Code               Swag       323  
3d-object-detection-for-autonomous-vehicles    2020-09-30 07:00:00  Code               Swag       333  
```

B. Download Kaggle

```
!kaggle competitions download -c titanic
!ls titanic
```

```
Downloading titanic.zip to /content
  0%|                                               |  0.00/34.1k [00:00<?, ?B/s]
100%|#################################################|  34.1k [00:00<00:00, 1.00MB/s]
gender_submission.csv  test.csv  train.csv
```

C. Unzip File

```
!unzip titanic.zip -d titanic
!ls titanic
```

```
Archive:  titanic.zip
  inflating: titanic/gender_submission.csv
  inflating: titanic/test.csv
  inflating: titanic/train.csv
gender_submission.csv  test.csv  train.csv
```

D. Read Dataset

```
import pandas as pd
df = pd.read_csv('/content/titanic/train.csv')
df.shape
```

```
(891, 12)
```

```
df.head()
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S

```
df.describe()
```

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.204208
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057	49.693429
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.910400
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000	14.454200
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000	31.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329200

```
df.describe(include='object')
```

	Name	Sex	Ticket	Cabin	Embarked
count	891	891	891	204	889
unique	891	2	681	147	3
top	Braund, Mr. Owen Harris	male	1601	B96 B98	S
freq	1	577	7	4	644

Dokumentasi Kaggle Command, selengkapnya ada di sini.

Latihan (1)

Dataset Download sebuah dataset dengan API Kaggle

```
!kaggle datasets download -d uciml/iris
!ls iris
```

```
Downloading iris.zip to /content
  0%|                                               |  0.00/4.70k [00:00<?, ?B/s]
100%|#################################################|  4.70k [00:00<00:00, 1.00MB/s]
iris.zip  iris.zip.1  iris.zip.2
```

Latihan (2)

Lakukan Unzip sebuah File

```
!unzip iris.zip -d iris
!ls iris
```

```
Archive:  iris.zip
  inflating: iris/Iris.csv
Iris.csv
```

Latihan (3)

Lakukan Read sebuah dataset dengan Pandas

```
import pandas as pd
df = pd.read_csv('/content/iris/Iris.csv')
df.shape
```

```
(150, 6)
```

DATAFRAME

Dataset yang terbaca dalam bentuk data frame yang selanjutnya akan dimanipulasi dan diolah. Tentang semua data dalam bentuk frame/table ini bisa dengan lebih jauh dipelajari dari Course Pengolahan Data dengan Pandas.

Dokumentasi API Pandas lengkapnya ada di sini.

Latihan (3)

Tampilkan 5 data teratas dengan header, ini untuk dataset dengan kurang dari yang jumlah proses yang cukup lama sehingga di dalam dataset ini cuplikan 5 data saja dulu

```
df.head(5)
```

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

Tetapi Data

Pada bagian ini, kita akan lihat bagaimana cara mengakses data dengan Pandas.

1. Ini data dari sebuah kolom
2. Ini data dari beberapa kolom
3. Ini data dari sebuah baris

Latihan (4)

Tampilkan data dari kolom yang yang pada dataset

```
df['Species']
```

```
0    Iris-setosa
1    Iris-setosa
2    Iris-setosa
3    Iris-setosa
4    Iris-setosa
Name: Species, dtype: object
```

Latihan (5)

Tampilkan data dari kolom kolom ke 2 dengan data yang ada di dataset ini.

```
df[['Species']]
```

	Species
0	Iris-setosa
1	Iris-setosa
2	Iris-setosa
3	Iris-setosa
4	Iris-setosa
...	...
145	Iris-virginica
146	Iris-virginica
147	Iris-virginica
148	Iris-virginica
149	Iris-virginica

150 rows × 1 columns

Latihan (6)

Dengan jumlah kolom, yang jumlah yaitu dataset? (cetak dalam print out di bawah ini)

```
df.shape[1]
```

```
print('Jumlah kolom dataset adalah', df.shape[1])
print('Jumlah kolom yang dataset adalah', df.shape[1])
```

```
Jumlah kolom dataset adalah 6
Jumlah kolom yang dataset adalah 6
```

Latihan (7)

Tampilkan data yang baris dengan index 10 dan index 15(pisah dengan koma)

```
df.iloc[[10,15]]
```

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
10	11	5.4	3.7	1.5	0.2	Iris-setosa
15	16	5.7	4.4	1.5	0.4	Iris-setosa

Latihan (8)

Tampilkan data yang baris index 10 dan index "Species" dengan dataset yang

```
df.iloc[[10,15],[5]]
```

	Species
10	Iris-setosa
15	Iris-setosa

Latihan (9)

Tampilkan data yang baris index 10 dan index "Species" dengan dataset, dan yang ditambahkan adalah data yang baris dengan index 15 (cetak dengan koma pisah index)

```
df.iloc[[10,15],[5]]
```

	Species
10	Iris-setosa
15	Iris-setosa

Latihan (10)

Tampilkan data kolom index "SepalLengthCm", "SepalWidthCm", "PetalLengthCm", "PetalWidthCm", "Species" dengan index dataset yang

```
df.iloc[:,[1,2,3,4,5]]
```

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	Iris-virginica
146	6.3	2.5	5.0	1.9	Iris-virginica
147	6.5	3.0	5.2	2.0	Iris-virginica
148	6.2	3.4	5.4	2.3	Iris-virginica
149	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 5 columns

Latihan (11)

Tampilkan data yang index 2 hingga index dengan dataset

```
df.iloc[2:,:]
```

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
5	6	5.4	3.9	1.7	0.4	Iris-setosa
6	7	4.6	3.4	1.4	0.3	Iris-setosa
...	...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	Iris-virginica	
146	6.3	2.5	5.0	1.9	Iris-virginica	
147	6.5	3.0	5.2	2.0	Iris-virginica	
148	6.2	3.4	5.4	2.3	Iris-virginica	
149	5.9	3.0	5.1	1.8	Iris-virginica	

Latihan (12)

Tampilkan data yang index 2 hingga index dengan dataset, dengan dataset

```
df.iloc[2:,:]
```

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
5	6	5.4	3.9	1.7	0.4	Iris-setosa
6	7	4.6	3.4	1.4	0.3	Iris-setosa
...	...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	Iris-virginica	
146	6.3	2.5	5.0	1.9	Iris-virginica	
147	6.5	3.0	5.2	2.0	Iris-virginica	
148	6.2	3.4	5.4	2.3	Iris-virginica	
149	5.9	3.0	5.1	1.8	Iris-virginica	

Latihan (13)

Hitung kolom dari dataset

```
df.shape[1]
```

```
6
```

Latihan (14)

Hitung jumlah baris dataset dan tampilkan

```
df.shape[0]
```

```
150
```

Latihan (15)

Hitung kolom yang index dan index dengan PetalWidthCm

```
df.iloc[:,[4]]
```

	PetalWidthCm
0	0.2
1	0.2
2	0.2
3	0.2
4	0.2
...	...
145	2.3
146	1.9
147	2.0
148	2.3
149	1.8

150 rows × 1 columns

Latihan (16)

Tampilkan data kolom index "SepalLengthCm", "SepalWidthCm", "PetalLengthCm", "PetalWidthCm", "Species" dengan dataset yang

```
df.iloc[:,[1,2,3,4,5]]
```

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	Iris-virginica
146	6.3	2.5	5.0	1.9	Iris-virginica
147	6.5	3.0	5.2	2.0	Iris-virginica
148	6.2	3.4	5.4	2.3	Iris-virginica
149	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 5 columns

Latihan (17)

Tampilkan data yang index index dengan yang index index dengan dataset dengan, dataset dengan

```
df.iloc[:,[1,2,3,4,5]]
```

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	Iris-virginica
146	6.3	2.5	5.0	1.9	Iris-virginica
147	6.5	3.0	5.2	2.0	Iris-virginica
148	6.2	3.4	5.4	2.3	Iris-virginica
149	5.9	3.0	5.1	1.8	Iris-virginica

Latihan 18

Tampilkan Header dari data dataset yang yang sudah di hitung oleh sebuah dataset (cetak dengan print out)

```
df.shape[1]
```

```
print('Header dari data dataset yang sudah di hitung oleh sebuah dataset', df.shape[1])
```

```
6
Header dari data dataset yang sudah di hitung oleh sebuah dataset 6
```

Latihan (19)

Tampilkan Header dari data dataset yang yang sudah di hitung oleh sebuah dataset (cetak dengan print out)

```
df.shape[0]
```

```
150
Header dari data dataset yang sudah di hitung oleh sebuah dataset 150
```

Latihan (20)

Hitung Mean dari dataset

```
df.mean()
```

```
Id               75.500000
SepalLengthCm     5.843333
SepalWidthCm      3.054000
PetalLengthCm     3.758667
PetalWidthCm      1.198667
dtype: float64
```

Latihan (21)

Cetak data Normal dari dataset yang sudah StandardScaler

```
from sklearn.preprocessing import StandardScaler
scaler = StandardScaler()
print(scaler.fit_transform(df.iloc[:,[1,2,3,4]]))
```

```
[[-1.72672352 -0.57578929 -1.56757623 -1.34022653]
 [-1.70783496 -1.13915857 -1.56757623 -1.34022653]
 [-1.68894641 -0.90068117 -1.62424854 -1.34022653]
 [-1.67005785 -1.05964967 -1.51090393 -1.34022653]
 [-1.65116929 -0.57578929 -1.56757623 -1.34022653]
 [-1.63228073 -0.18190992 -1.40089161 -1.07893797]
 [-1.61339218 -0.90068117 -1.56757623 -1.21958225]
 [-1.59450362 -0.34731054 -1.45756931 -1.34022653]
 [-1.57561506 -1.13915857 -1.51090393 -1.34022653]
 [-1.55672650 -0.57578929 -1.45756931 -1.47958080]
 [-1.53783795 -0.18190992 -1.34423469 -1.34022653]
 [-1.51894939 -0.34731054 -1.51090393 -1.47958080]
 [-1.50006083 -1.29762011 -1.62424854 -1.47958080]
 [-1.48117227 -2.24792967 -1.73759315 -1.47958080]
 [-1.46228372 -0.10347038 -1.29756238 -1.21958225]
 [-1.44339516 -0.81973075 -1.18421777 -1.07893797]
 [-1.42450660 -0.34731054 -1.29756238 -1.34022653]
 [-1.40561804 -0.57578929 -1.07087316 -1.07893797]
 [-1.38672948 -0.34731054 -1.23089700 -1.21958225]
 [-1.36784093 -0.81973075 -1.07087316 -1.07893797]
 [-1.34895237 -0.57578929 -1.23089700 -1.34022653]
 [-1.33006381 -0.34731054 -1.07087316 -1.21958225]
 [-1.31117525 -1.29762011 -1.29756238 -1.47958080]
 [-1.29228670 -0.57578929 -1.07087316 -1.34022653]
 [-1.27339814 -0.34731054 -1.18421777 -1.47958080]
 [-1.25450958 -0.10347038 -1.07087316 -1.34022653]
 [-1.23562102 -1.29762011 -1.18421777 -1.47958080]
 [-1.21673246 -0.57578929 -1.07087316 -1.34022653]
 [-1.19784391 -0.34731054 -1.23089700 -1.21958225]
 [-1.17895535 -0.81973075 -1.29756238 -1.47958080]
 [-1.16006679 -0.57578929 -1.07087316 -1.34022653]
 [-1.14117823 -0.34731054 -1.23089700 -1.21958225]
 [-1.12228967 -0.57578929 -1.07087316 -1.34022653]
 [-1.10340112 -0.34731054 -1.23089700 -1.21958225]
 [-1.08451256 -0.10347038 -1.07087316 -1.34022653]
 [-1.06562400 -1.29762011 -1.18421777 -1.47958080]
 [-1.04673544 -0.57578929 -1.07087316 -1.34022653]
 [-1.02784688 -0.34731054 -1.23089700 -1.21958225]
 [-1.00895833 -0.81973075 -1.29756238 -1.47958080]
 [-0.99006977 -0.57578929 -1.07087316 -1.34022653]
 [-0.97118121 -0.34731054 -1.23089700 -1.21958225]
 [-0.95229265 -0.10347038 -1.07087316 -1.34022653]
 [-0.93340409 -1.29762011 -1.18421777 -1.47958080]
 [-0.91451554 -0.57578929 -1.07087316 -1.34022653]
 [-0.89562698 -0.34731054 -1.23089700 -1.21958225]
 [-0.87673842 -0.81973075 -1.29756238 -1.47958080]
 [-0.85784986 -0.57578929 -1.07087316 -1.34022653]
 [-0.83896130 -0.34731054 -1.23089700 -1.21958225]
 [-0.82007275 -0.10347038 -1.07087316 -1.34022653]
 [-0.80118419 -1.29762011 -1.18421777 -1.47958080]
 [-0.78229563 -0.57578929 -1.07087316 -1.34022653]
 [-0.76340707 -0.34731054 -1.23089700 -1.21958225]
 [-0.74451851 -0.81973075 -1.29756238 -1.47958080]
 [-0.72562996 -0.57578929 -1.07087316 -1.34022653]
 [-0.70674140 -0.34731054 -1.23089700 -1.21958225]
 [-0.68785284 -0.10347038 -1.07087316 -1.34022653]
 [-0.66896428 -1.29762011 -1.18421777 -1.47958080]
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