

# Cloud Computing and Big Data Analytics

HW4: Large-Scale with PySpark

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# Requirement and Environment Setting

# Requirement

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- Google Colab with PySpark ML lib
- Use jupyter notebook template in HW4.zip

# Problem Description

# Customer Churn Prediction

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- Customer churn occurs when customers or subscribers stop doing business with a company or service.



Photo credited  
[CUSTOMER BLISS](#)

# Dataset Description

- Bank Customer Churn
- Dataset Format: csv
- There are the following information in public.csv:

CustomerId,Surname,CreditScore,Geography,Gender,Age,Tenure,Balance,NumOfProducts,HasCrCard,IsActiveMember,EstimatedSalary,Exited

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
2	15565701	Ferri	698	Spain	Female	39	9	161993.9	1	0	0	90212.38	0
3	15565706	Akobundu	612	Spain	Male	35	1	0	1	1	1	83256.26	1
4	15565796	Docherty	745	Germany	Male	48	10	96048.55	1	1	0	74510.65	0
5	15565806	Toosey	532	France	Male	38	9	0	2	0	0	30583.95	0
6	15565878	Bates	631	Spain	Male	29	3	0	2	1	1	197963.5	0
7	15565879	Riley	845	France	Female	28	9	0	2	1	1	56185.98	0
8	15565996	Arnold	653	France	Male	44	8	0	2	1	1	154639.7	0
9	15566030	Tu	497	Germany	Male	41	5	80542.81	1	0	0	88729.22	1
10	15566091	Thomsen	545	Spain	Female	32	4	0	1	1	0	94739.2	0
11	15566111	Estes	596	France	Male	39	9	0	1	1	0	48963.59	0
12	15566139	Ts'ui	526	France	Female	37	5	53573.18	1	1	0	62830.97	0
13	15566251	Ferrari	618	France	Female	37	5	96652.86	1	1	0	98686.4	1
14	15566253	Manning	580	Germany	Male	44	9	143391.1	1	0	0	146891.1	1

# Problem Description

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- Predict customers exit (1) or not(0) (Exited).
- This is a binary prediction result.
- You need to use 'public.csv' to build PySpark ML model.
- TA will load hidden dataset to do evaluation.

- Please show your output as the following type:

CustomerID,Exited

12313123,0

32121311,0

...



# Grading Policy

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- Total score: 100
- If your result over baseline, your score is more than 70.
- The Top-10% students get 100, Top-30% students get 90, and so on.

	Top-10%	Top-30%	Top-50%	Over baseline
score	100	90	80	70

- Baseline:  $f1\ score \geq 0.72$

# Requirement and Notification

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- Use template Jupyter Notebook file to do this homework.
- TA will use public dataset to validate your model, then load private dataset and use your model to predict the result with Jupyter Notebook.
- If your output format is wrong, your score will have some discount (score\*0.8).

# Deadline

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- Submission Deadline: before 2021/06/24 23:59 (on new E3)
- Submission File: CCBDA-HW4-[Student\_ID].ipynb
  - New E3: jupyter notebook
  - Remember write your student ID to rename the file.
- If you have any question, feel free to send email to contact TA.
  - TA: Eric (曾偉倫)
  - Email: [eric840610.ee02@g2.nctu.edu.tw](mailto:eric840610.ee02@g2.nctu.edu.tw)

# Useful Resource

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- [\(English\)Tutorial: Build a machine learning app with Apache Spark MLlib - Azure Synapse Analytics | Microsoft Docs](#)
- [\(Traditional Chinese\)教學課程：使用 Apache Spark MLlib 建置機器學習應用程式 - Azure Synapse Analytics | Microsoft Docs](#)