인공지능 기초 실습

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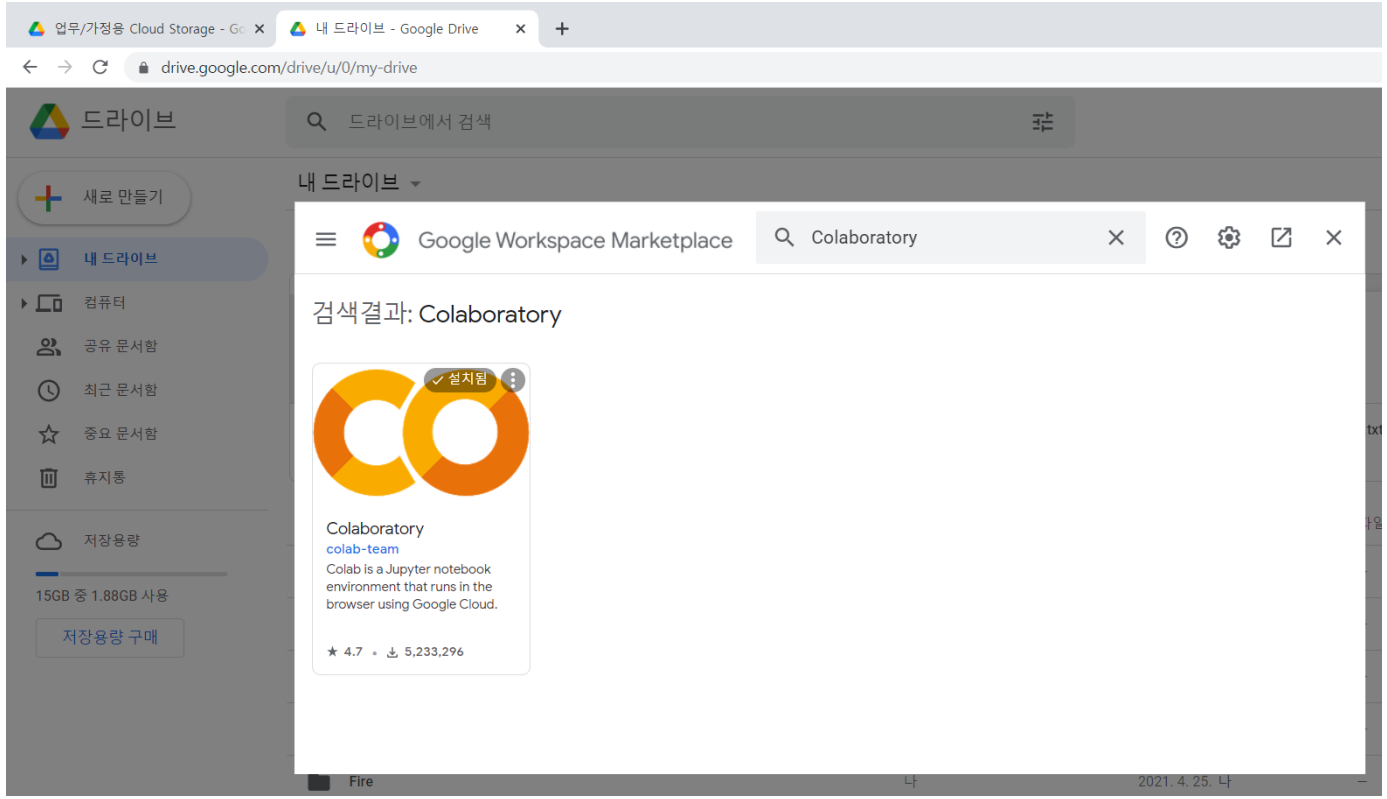
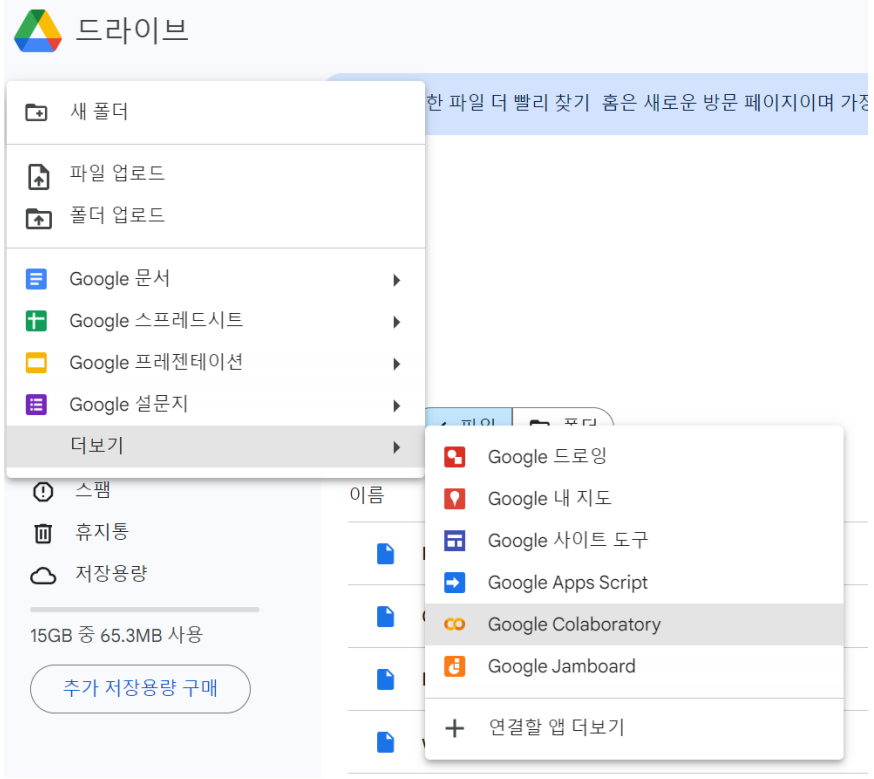
실습 환경 및 딥러닝 코드 준비

코랩 설치 방법

- https://www.google.com/intl/ko_KR/drive/ 로 이동하여 우측 상단에 [드라이브로 이동]을 클릭

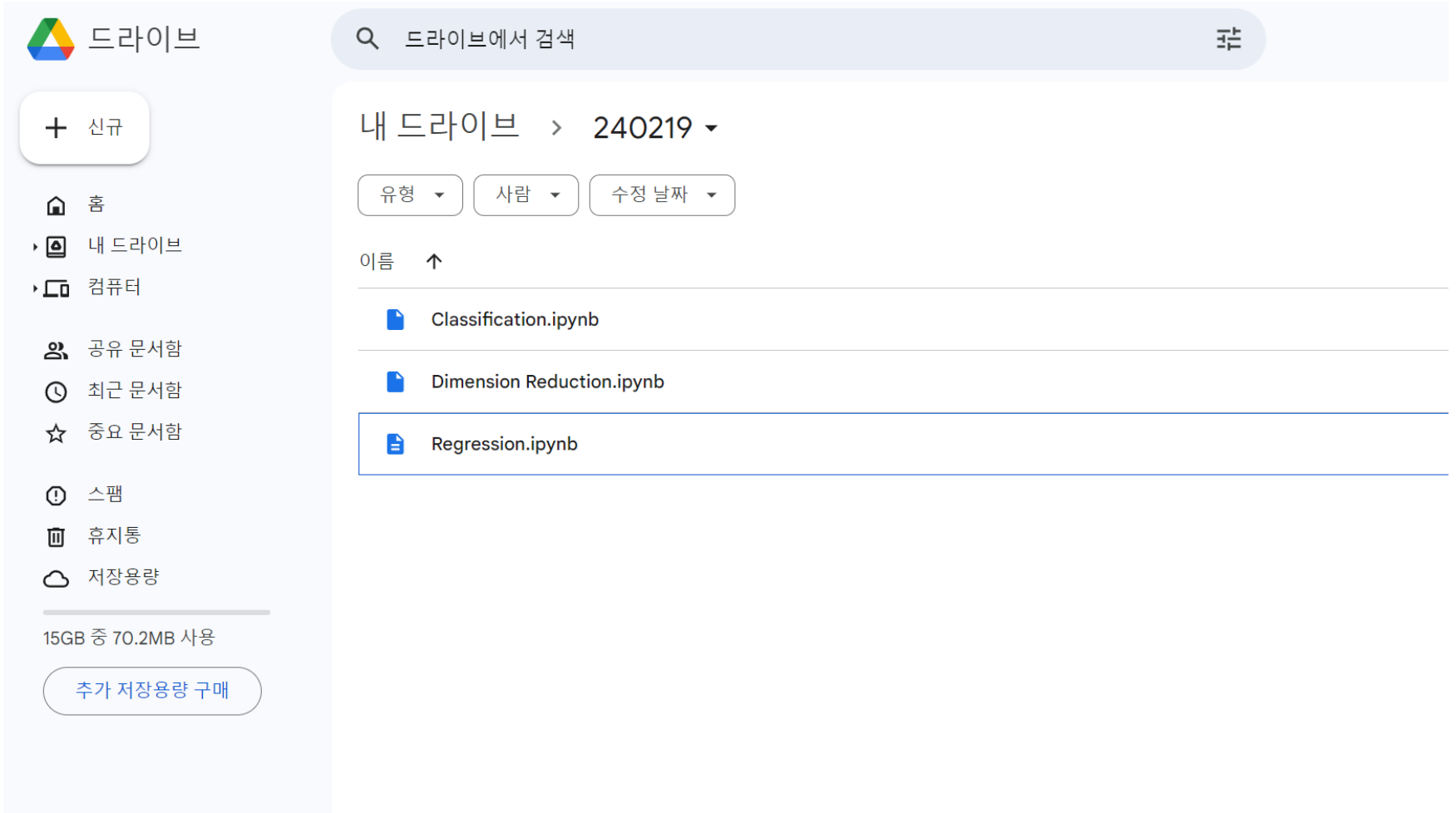
- [새로 만들기 (신규)] -> [더보기] -> [연결한 앱 더보기] -> Colaboratory 설치





딥러닝 코드 준비

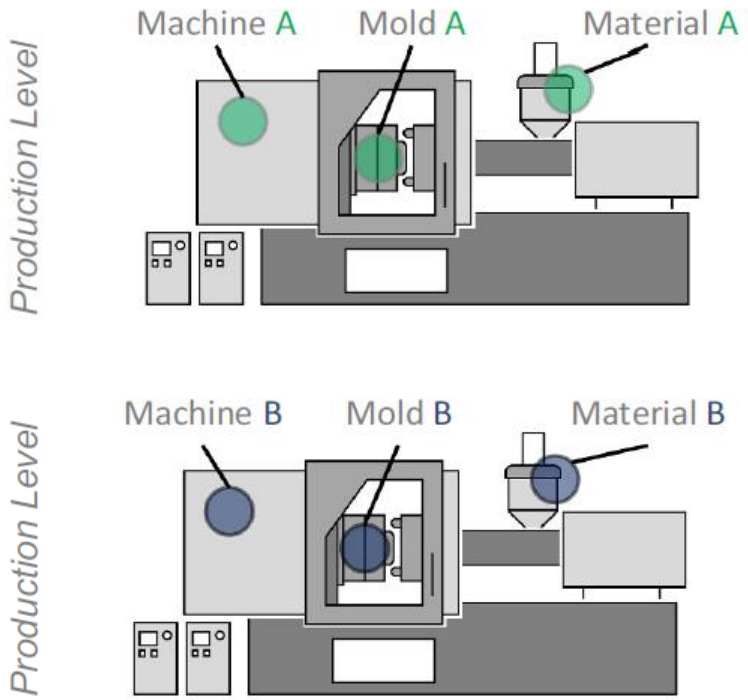
- Google [내 드라이브]에 딥러닝 코드 업로드



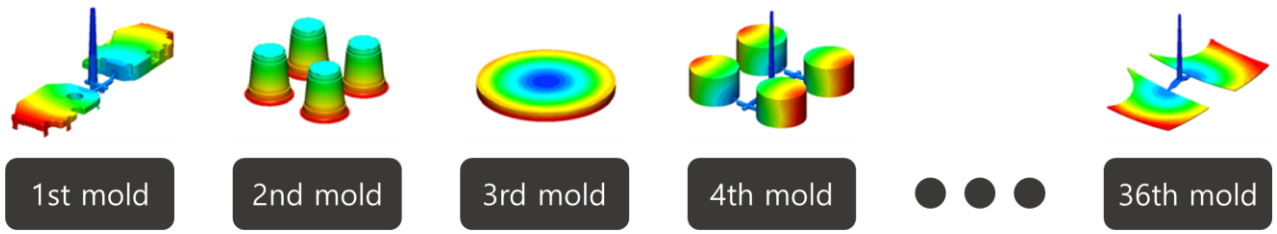
Regression (회귀분석)

Injection Molding Process

- Multiphysics feature-based manufacturing process
  - Input (x): 32 Geometric features + 5 Process features
  - Output (y): Weight of the molded part (ground truth)



(a)



Geometric Features

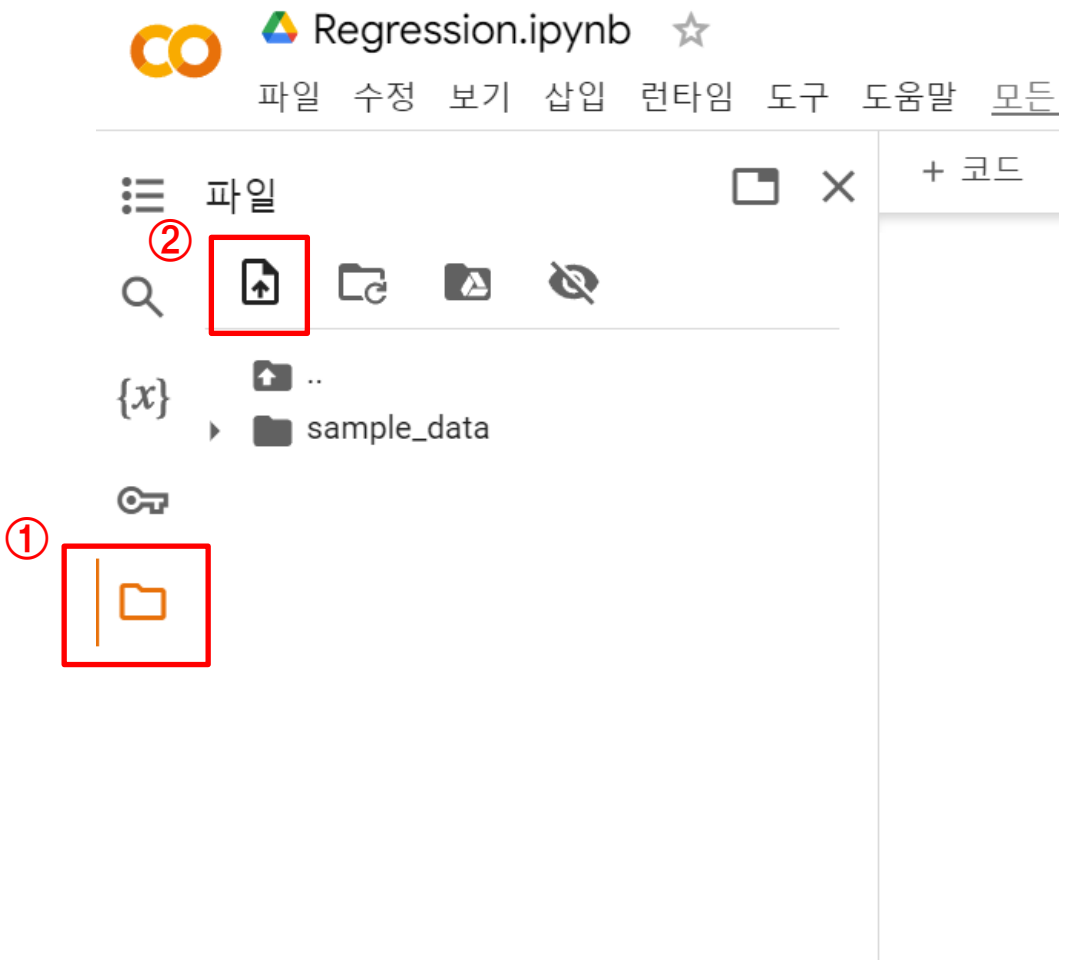
Cavity Volume	Runner Volume	Number of Cavities
Overall Surface Area	Cavity Surface Area	Runner Surface Area
Overall Projection Area XY	Overall Projection Area YZ	Overall Projection Area ZX
Max Part Thickness	Avg Part Thickness	Std Part Thickness
Max Flow Length	Min Flow Length	Avg Flow Length
Std Flow Length	Max Flow Length to Thickness	Min Flow Length to Thickness
Avg Flow Length to Thickness	Std Flow Length to Thickness	Max Gate Hydraulic Diameter
Min Gate Hydraulic Diameter	Avg Gate Hydraulic Diameter	Std Gate Hydraulic Diameter
Number of Gates		

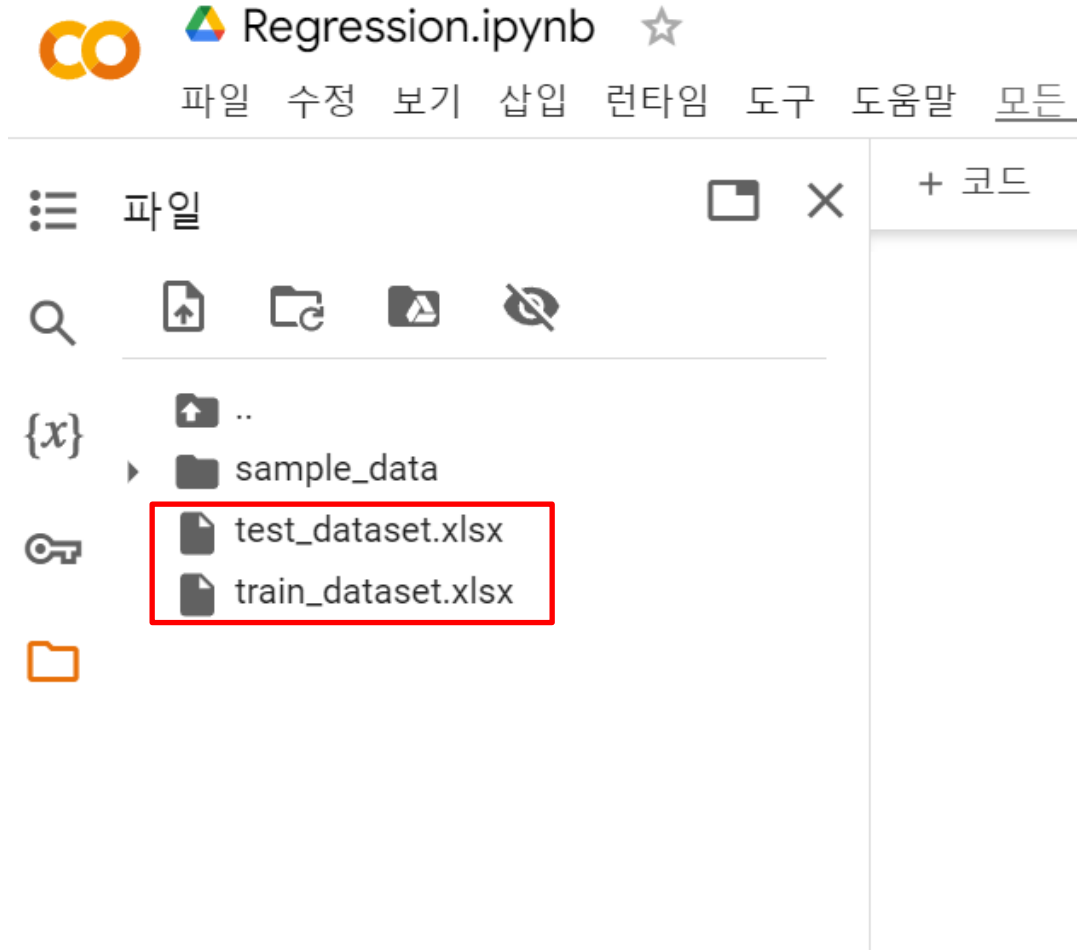
Process Features

Fill Time
Melt Temperature
Mold Temperature
Packing Pressure
Packing Time

Iljeok Kim, Juwon Na, Jong Pil Yun*, and Seungchul Lee*, 2023, "Deep Feature Selection Framework for Quality Prediction in Injection Molding Process," IEEE Transactions on Industrial Informatics.

로컬 파일을 코랩으로 불러오기

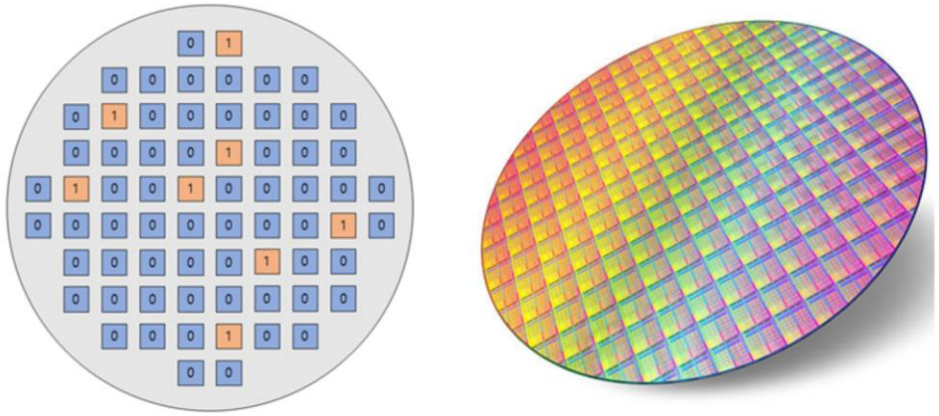


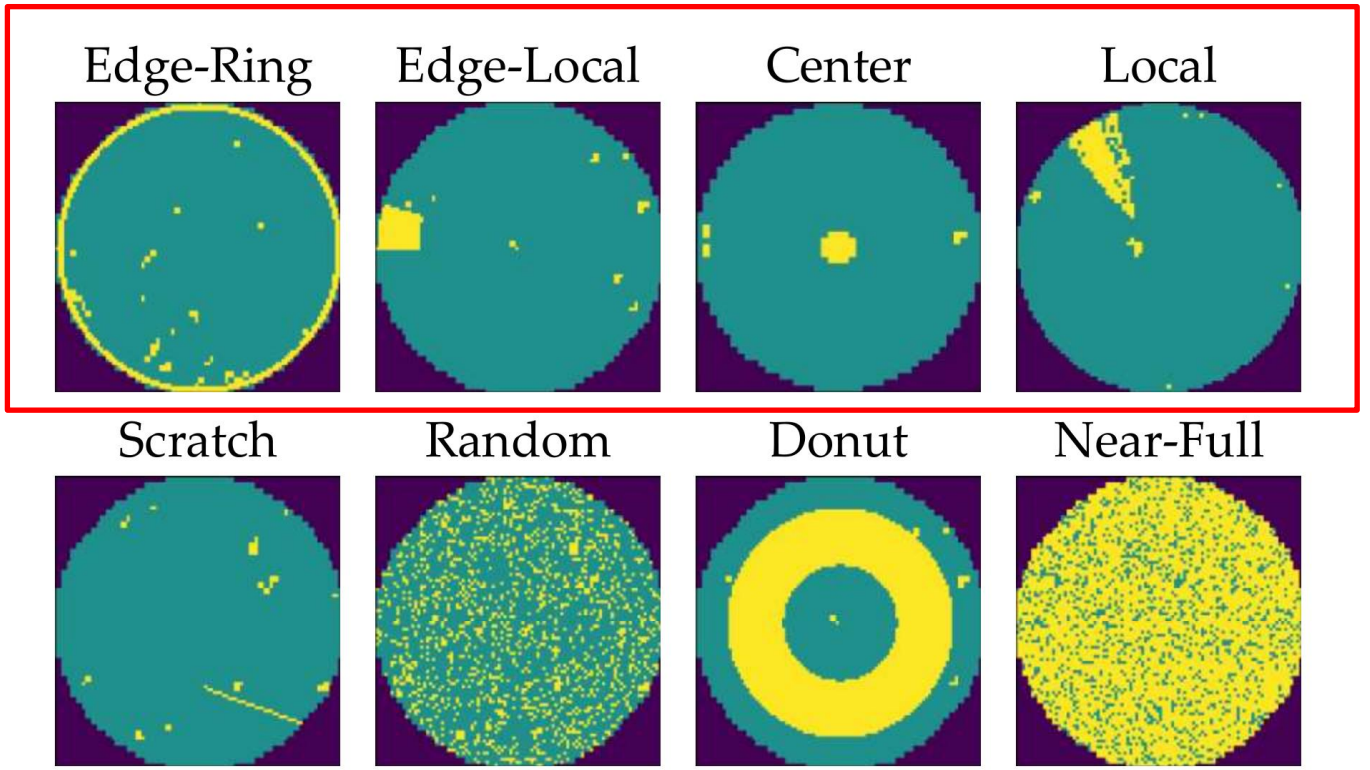


Classification (분류)

Semiconductor Wafer Failure Maps

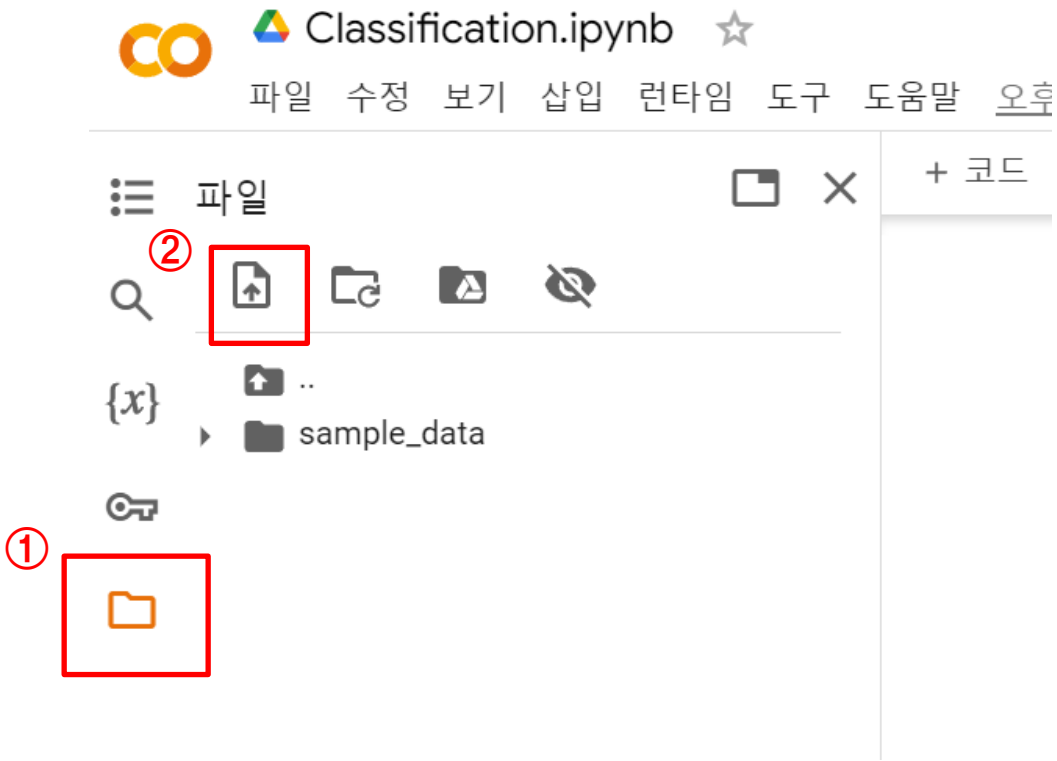
- Identification of wafer failure pattern automatically
  - Input (x): Wafer failure map images (WM-811K)
  - Output (y): Failure pattern labels

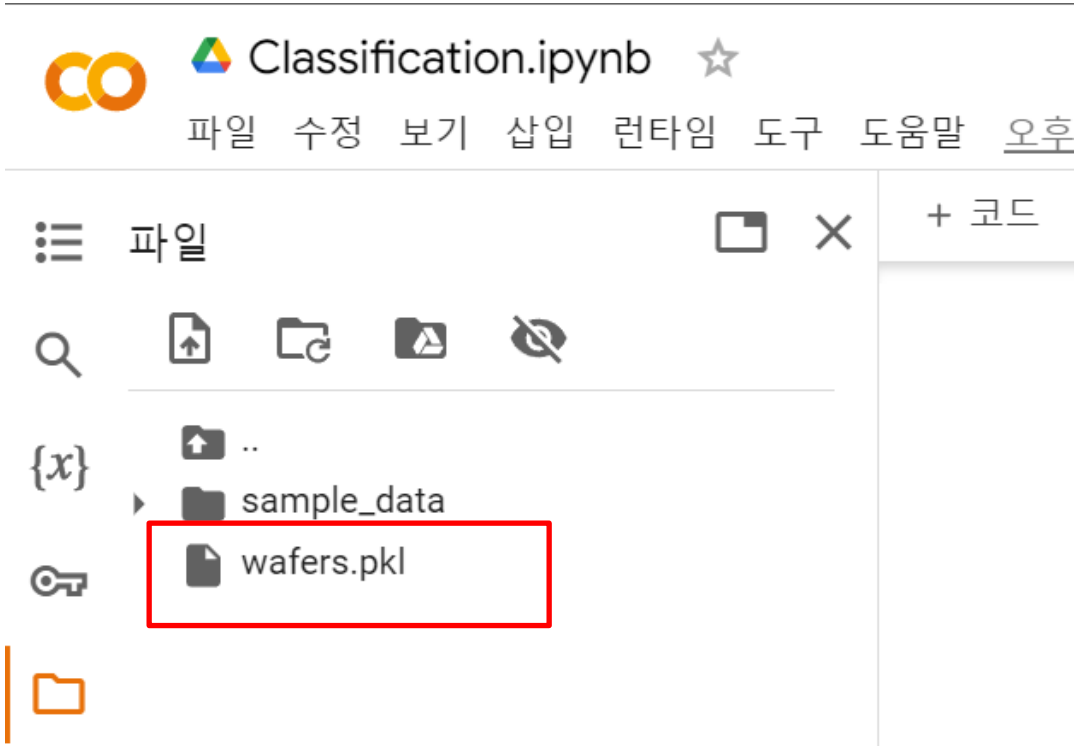




Iljoo Jeong, Soo Young Lee, Keonhyeok Park, Iljeok Kim, Hyunsuk Huh, and Seungchul Lee*, 2023, "Wafer Map Failure Pattern Classification using Geometric Transformation-Invariant Convolutional Neural Network," Scientific Reports.

로컬 파일을 코랩으로 불러오기

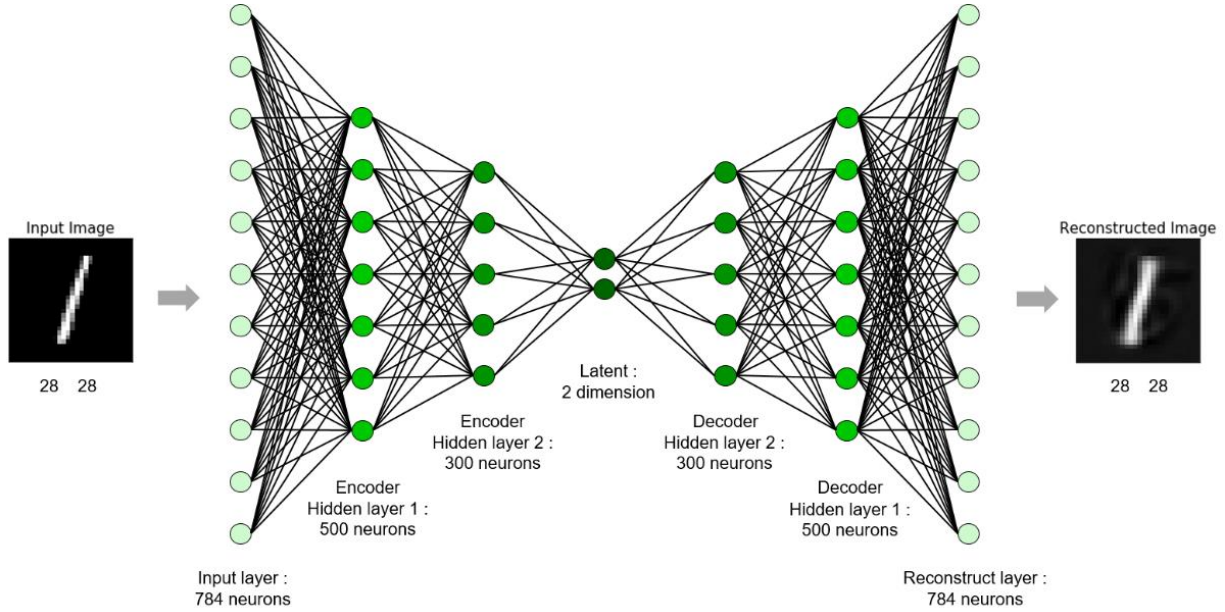




Dimension Reduction (차원 축소)

MNIST

- Visualization of handwritten digits
  - Input (x): (1, 5, 6) digit images
  - Output (y): (1, 5, 6) digit images



MNIST Example: Walk in the Latent Space