

1. **Task Description:** Given train dataset “train_data.csv”, find the best model for the below tasks

A. **Input Features:** Morphological phenotypes

- i. Column E-BV (ST***CV) : Cortical Volume of 70 brain regions
- ii. Column BW-EN (ST***TA) : Average Thickness of 70 brain regions
- iii. Beware of missing features (refer to Professor’s lecture on imputation)

Task 1 (3-class Classification): Predict the diagnosis group of subjects i.

Column A (DX_bl): Diagnosis group of subject

- 0: Cognitive normal
- 1: Mild cognitive impairment
- 2: Alzheimer’s disease

C. **Task 2 (3-logit Regression):** Predict the cognitive assessment scores of subjects i.

Column B (ADAS11): Alzheimer’s Disease Assessment Scale (11 questions version) ii.

Column C (ADAS13): Alzheimer’s Disease Assessment Scale (13 questions version) iii.

Column D (MMSE): Mini-Mental State Examination

2. **Project Requirement**

A. Build the best model based on the given train dataset “train_data.csv”

B. Report scores for 10-fold cross validation

C. Compare with at least two other models

- i. i.e. Total of at least 6 models should be created

(One best model and two comparing models for each task)

D. Analyze and discuss your models and results in markdown cells

3. **Implementation Requirement**

A. Use the Google Colab (<https://colab.research.google.com/>)

B. You may use any library of your choice (e.g. Scikit-learn, Tensorflow, PyTorch, ...)

C. **(IMPORTANT) Submit two .ipynb files and model weight files**

- i. In each of the .ipynb file, write your name, ID, and the link to your Colab project ii.

First .ipynb file

- 1. This should contain your code, model comparisons, analysis, discussion *etc.*

iii. Second .ipynb file

- 1. This should contain code for loading and evaluating your best model

4. **Necessary Factors**

A. Evaluation scores on test dataset

- i. Test dataset will not be available to students
- ii. Scores will be ranked and used as a reference for grading

B. Comparison, analysis, discussion *etc.*

- i. Write in English
- ii. Be thorough and precise