

Use of AI

[1] **Tool:** ChatGPT

Prompt: My KNN model in Jupyter crashes or takes too long – how can I optimize GridSearchCV to run faster without changing its logic?

Output Summary: Suggested reducing the number of neighbors (**k**) searched (from 1-99 to 1-30) and lowering cross-validation folds (**cv=5** to **cv=3**). Explained how each K value increases computation time. Helped ensure that smaller parameter ranges still met assignment requirements.

[2] **Tool:** ChatGPT

Prompt: Why does my GridSearchCV take forever when using `np.arange(1,100)` for KNN?

Output Summary: Explained that GridSearchCV tests every combination of hyperparameters, so searching 99 K values × 3 CV folds means ~300 full model fits. Recommended modest ranges (e.g., 1-30) to balance performance and runtime.

[3] **Tool:** ChatGPT

Prompt: My notebook crashes when running KNN – how can I reduce memory use safely?

Output Summary: Recommended converting large dummy-variable DataFrame to float32 (`X = X.astype(np.float32)`) to lower memory pressure without changing numeric accuracy.

[4] **Tool:** ChatGPT

Prompt: How can I verify my model evaluation steps match the KNN classification document from COE 379L?

Output Summary: Clarified that using `classification_report()` with accuracy, precision, recall, and F1-score aligns with the KNN lecture's evaluation section and that F1 is implied when analyzing classification balance.

[5] **Tool:** ChatGPT

Prompt: My metric calculations for accuracy, precision, recall, and F1-score were repetitive and occasionally threw zero-division warnings. How do I fix this and organize all the model results into one clean summary table?

Output Summary: ChatGPT helped me refactor my code by creating a reusable function `row()` that computes all four metrics safely using `zero_division=0`. It also suggested combining them into a single pandas DataFrame for easier comparison and readability. This fixed my metric calculation issue and made the evaluation output more concise and clear for the final report