

Part1:MLFlow Tracking

TaskC:Visualize experiment results.

1. Assign one team member to analyze the logged metrics and artifacts using MLflow UI:

a. Parameters Affecting Model Training

| Parameter | Description | Source | Example Values |
|-------------|--|----------------------------------|-----------------------|
| n_neighbors | Number of neighbors to use for k-neighbors queries. | User input during model training | 3, 5, 7 |
| weights | Weight function used in prediction. Options are 'uniform' (all neighbors have equal weight) or 'distance'. | User input during model training | 'uniform', 'distance' |
| metric | Distance metric for the tree. Can be 'euclidean', 'manhattan', or 'chebyshev'. | User input during model training | 'euclidean' |
| algorithm | Algorithm used to compute the nearest neighbors. Can be 'auto', 'ball_tree', 'kd_tree', or 'brute'. | User input during model training | 'auto' |

b. Metrics Collected During Evaluation

| Metric | Description |
|----------|--|
| accuracy | The fraction of correct predictions over total predictions. |
| cv_mean | Mean accuracy of the model across 5-fold cross-validation. |
| cv_std | Standard deviation of accuracy across 5-fold cross-validation. |

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|-----------------------|--|
| training_time | Time taken to train the model in seconds. |
| confusion_matrix | A matrix representing true positive, true negative, false positive, and false negative counts. |
| classification_report | Precision, recall, F1-score, and support for each class. |
| class_0_precision | Precision for class 0 (negative cases). |
| class_0_recall | Recall for class 0 (negative cases). |
| class_0_f1 | F1-score for class 0 (negative cases). |
| class_1_precision | Precision for class 1 (positive cases). |
| class_1_recall | Recall for class 1 (positive cases). |
| class_1_f1 | F1-score for class 1 (positive cases). |
| true_negatives | Number of true negatives (correctly predicted negative cases). |
| false_positives | Number of false positives (incorrectly predicted positive cases). |
| false_negatives | Number of false negatives (incorrectly predicted negative cases). |
| true_positives | Number of true positives (correctly predicted positive cases). |

c. Data Features

| Feature | Description | Data Type |
|----------|--------------------------------------|-------------|
| age | Age of the individual. | Numeric |
| sex | Gender of the individual. | Categorical |
| cp | Chest pain type. | Categorical |
| trestbps | Resting blood pressure. | Numeric |
| chol | Serum cholesterol in mg/dl. | Numeric |
| fbs | Fasting blood sugar > 120 mg/dl. | Binary |
| restecg | Resting electrocardiographic result. | Categorical |
| thalach | Maximum heart rate achieved. | Numeric |

| | | |
|---------|--|-------------|
| exang | Exercise-induced angina. | Binary |
| oldpeak | ST depression induced by exercise. | Numeric |
| slope | Slope of the peak exercise ST segment. | Numeric |
| ca | Number of major vessels. | Numeric |
| thal | Thalassemia. | Categorical |

2. Create a comparison report of different runs:

You can see exactly compares in “compare_runs.csv” or “compare_runs.txt” from directory “compare_runs_images” in Project repository.