

# Low-Level Design

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## API Endpoints

### 1. **POST /train-predict**

**Description:** Trains a model using provided training data and predicts results on test data.

Field	Details
<b>Method</b>	POST
<b>Content-Type</b>	multipart/form-data
<b>Form Fields</b>	trainData (CSV), testData (CSV)
<b>Response</b>	{ "runId": "string", "status": "success" }
<b>Errors</b>	400 (Bad Request), 500 (Internal Error)
<b>Auth Required</b>	No

### 2. **POST /models/predict**

**Description:** Runs prediction using an existing trained model.

Field	Details
<b>Method</b>	POST
<b>Content-Type</b>	multipart/form-data
<b>Form Field</b>	file (CSV)
<b>Response</b>	JSON predictions
<b>Errors</b>	400, 500
<b>Auth Required</b>	No

### 3. **POST /clean**

**Description:** Cleans the uploaded dataset.

Field	Details
<b>Method</b>	POST
<b>Content-Type</b>	multipart/form-data
<b>Form Field</b>	file (CSV)
<b>Response</b>	Cleaned file (as blob/download)
<b>Errors</b>	400, 500
<b>Auth Required</b>	No

#### 4. GET /runs/:runId/artifacts/figures

**Description:** Lists generated figure files for a run.

Field	Details
<b>Method</b>	GET
<b>Path Params</b>	runId
<b>Response</b>	[ { "path": "filename.png", "url": "/api/runs/<runId>/artifacts/figures/filename.png" } ]
<b>Errors</b>	404
<b>Auth Required</b>	No

#### 5. GET /runs/:runId/artifacts/figures/:filename

**Description:** Serves an individual figure image.

Field	Details
<b>Method</b>	GET
<b>Path Params</b>	runId , filename
<b>Response</b>	image/png or image/jpeg
<b>Errors</b>	400 (Invalid type), 404
<b>Auth Required</b>	No

#### 6. GET /runs/:runId/artifacts/features-dropped

**Description:** Returns plain-text list of features dropped during model training.

Field	Details
<b>Method</b>	GET
<b>Path Params</b>	<code>runId</code>
<b>Response</b>	Plain text (feature list)
<b>Errors</b>	404
<b>Auth Required</b>	No

## 7. `GET /runs/:runId/artifacts/predictions/confusion_matrix.png`

**Description:** Serves confusion matrix image from prediction results.

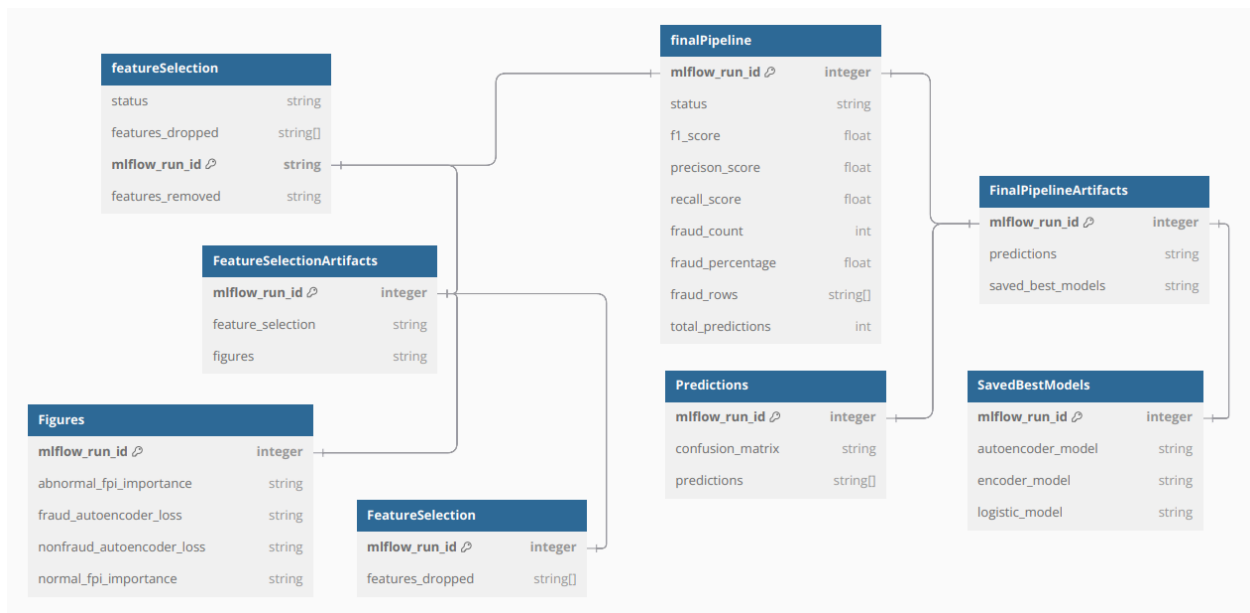
Field	Details
<b>Method</b>	GET
<b>Path Params</b>	<code>runId</code>
<b>Response</b>	<code>image/png</code>
<b>Errors</b>	404
<b>Auth Required</b>	No

## 8. `GET /runs/:runId/metrics`

**Description:** Returns model performance metrics in JSON.

Field	Details
<b>Method</b>	GET
<b>Path Params</b>	<code>runId</code>
<b>Response</b>	JSON: Accuracy, Precision, etc.
<b>Errors</b>	404 (Missing file), 500 (Parse error)
<b>Auth Required</b>	No

# Data Models



## Tools & Technologies

API Framework	Express.js
ML Tracking	MLflow
Data Versioning	DVC
Storage	MongoDB + Local Filesystem
Containerization	Docker