

```
CREATE TABLE User (
    userID  BIGINT UNSIGNED NOT NULL AUTO_INCREMENT,
    Fname   VARCHAR(100)  NOT NULL,
    Lname   VARCHAR(100)  NOT NULL,
    Email   VARCHAR(255)  NOT NULL,
    CreatedAt TIMESTAMP    NOT NULL DEFAULT CURRENT_TIMESTAMP,
    PRIMARY KEY (userID),
    UNIQUE KEY uq_user_email (Email)
);
```

```
CREATE TABLE Project (
    ProjectID  BIGINT UNSIGNED NOT NULL AUTO_INCREMENT,
    name      VARCHAR(200)  NOT NULL,
    status     ENUM('active','archived') NOT NULL DEFAULT 'active',
    created_at TIMESTAMP    NOT NULL DEFAULT CURRENT_TIMESTAMP,
    userID    BIGINT UNSIGNED NOT NULL,
    PRIMARY KEY (ProjectID),
    FOREIGN KEY (userID) REFERENCES User(userID)
        ON UPDATE CASCADE
        ON DELETE RESTRICT
);
```

```
CREATE TABLE Dataset (
    DatasetID  BIGINT UNSIGNED NOT NULL AUTO_INCREMENT,
    name      VARCHAR(200)  NOT NULL,
    version   VARCHAR(50),
    URL       VARCHAR(1000) NOT NULL,
    type      ENUM('text','image','tabular','logs','audio','video') NOT NULL,
    ProjectID BIGINT UNSIGNED NOT NULL,
    PRIMARY KEY (DatasetID),
    UNIQUE KEY uq_dataset_project_name (ProjectID, name),
    FOREIGN KEY (ProjectID) REFERENCES Project(ProjectID)
        ON UPDATE CASCADE
        ON DELETE CASCADE
);
```

```
CREATE TABLE Agent (
    AgentID  BIGINT UNSIGNED NOT NULL AUTO_INCREMENT,
    name      VARCHAR(200)  NOT NULL,
    version   VARCHAR(50),
    model     VARCHAR(200),
    goal      TEXT,
    ProjectID BIGINT UNSIGNED NOT NULL,
    PRIMARY KEY (AgentID),
```

```
FOREIGN KEY (ProjectID) REFERENCES Project(ProjectID)
  ON UPDATE CASCADE
  ON DELETE CASCADE
);
```

```
CREATE TABLE Run (
  RunID      BIGINT UNSIGNED NOT NULL AUTO_INCREMENT,
  Status     ENUM('queued','running','succeeded','failed','canceled') NOT NULL DEFAULT
  'queued',
  `time`     TIMESTAMP    NOT NULL DEFAULT CURRENT_TIMESTAMP,
  notes      TEXT,
  Parent_RunID BIGINT UNSIGNED NULL,
  AgentID    BIGINT UNSIGNED NOT NULL,
  PRIMARY KEY (RunID),
  FOREIGN KEY (AgentID) REFERENCES Agent(AgentID)
    ON UPDATE CASCADE
    ON DELETE CASCADE,
  FOREIGN KEY (Parent_RunID) REFERENCES Run(RunID)
    ON UPDATE CASCADE
    ON DELETE SET NULL
);
```

```
CREATE TABLE Environment (
  EnvironmentID BIGINT UNSIGNED NOT NULL AUTO_INCREMENT,
  Name          VARCHAR(200)  NOT NULL,
  Framework     VARCHAR(100),
  Python_Version VARCHAR(50),
  GPU_Cores    INT UNSIGNED,
  CPU_Cores    INT UNSIGNED,
  RunID        BIGINT UNSIGNED NOT NULL,
  PRIMARY KEY (EnvironmentID),
  FOREIGN KEY (RunID) REFERENCES Run(RunID)
    ON UPDATE CASCADE
    ON DELETE CASCADE
);
```

```
CREATE TABLE RunStep (
  RunID      BIGINT UNSIGNED NOT NULL,
  Step_No    INT        NOT NULL,
  Name       VARCHAR(200),
  Status     ENUM('pending','ok','error') DEFAULT 'pending',
  Step_Type  ENUM('plan','tool_call','observe','revise','finalize'),
```

```

Time      DATETIME      NOT NULL DEFAULT CURRENT_TIMESTAMP,
PRIMARY KEY (RunID, Step_No),
FOREIGN KEY (RunID) REFERENCES Run(RunID)
    ON UPDATE CASCADE
    ON DELETE CASCADE
);

```

```

CREATE TABLE RunMetric (
    ID      BIGINT UNSIGNED NOT NULL AUTO_INCREMENT,
    RunID   BIGINT UNSIGNED NOT NULL,
    Name    VARCHAR(200)  NOT NULL,
    Value_Text  VARCHAR(1000),
    DataType  ENUM('numeric','text','boolean','json','other') NOT NULL DEFAULT 'text',
    Value_Numeric DOUBLE,
    PRIMARY KEY (ID),
    FOREIGN KEY (RunID) REFERENCES Run(RunID)
        ON UPDATE CASCADE
        ON DELETE CASCADE,
    CHECK (Value_Text IS NOT NULL OR Value_Numeric IS NOT NULL)
);

```

```

CREATE TABLE Artifact (
    ArtifactID BIGINT UNSIGNED NOT NULL AUTO_INCREMENT,
    Type      ENUM('file','log','image','model','report') NOT NULL,
    URI       VARCHAR(1000)  NOT NULL,
    Checksum  VARCHAR(128),
    Created_at TIMESTAMP     NOT NULL DEFAULT CURRENT_TIMESTAMP,
    RunID     BIGINT UNSIGNED NOT NULL,
    PRIMARY KEY (ArtifactID),
    FOREIGN KEY (RunID) REFERENCES Run(RunID)
        ON UPDATE CASCADE
        ON DELETE CASCADE
);

```

```

-- Optional: clear existing data safely (child-to-parent), then re-enable FK checks
SET FOREIGN_KEY_CHECKS = 0;
TRUNCATE TABLE `Artifact`;
TRUNCATE TABLE `RunMetric`;
TRUNCATE TABLE `RunStep`;
TRUNCATE TABLE `Environment`;
TRUNCATE TABLE `Dataset`;
TRUNCATE TABLE `Run`;

```

```
TRUNCATE TABLE `Agent`;
TRUNCATE TABLE `Project`;
TRUNCATE TABLE `User`;
SET FOREIGN_KEY_CHECKS = 1;

START TRANSACTION;

-- 1) Users
INSERT INTO `User` (`userID`, `Fname`, `Lname`, `Email`, `CreatedAt`) VALUES
(1,'Aarav','Sharma','aarav1@example.com','2025-09-30 10:00:00'),
(2,'Diya','Patel','diya2@example.com','2025-09-30 10:01:00'),
(3,'Kabir','Rao','kabir3@example.com','2025-09-30 10:02:00'),
(4,'Isha','Iyer','isha4@example.com','2025-09-30 10:03:00'),
(5,'Vivaan','Gupta','vivaan5@example.com','2025-09-30 10:04:00'),
(6,'Myra','Khan','myra6@example.com','2025-09-30 10:05:00'),
(7,'Advait','Nair','advait7@example.com','2025-09-30 10:06:00'),
(8,'Sara','Mehta','sara8@example.com','2025-09-30 10:07:00'),
(9,'Ishaan','Reddy','ishaan9@example.com','2025-09-30 10:08:00'),
(10,'Riya','Das','riya10@example.com','2025-09-30 10:09:00');
```

```
-- 2) Projects (FK → User.userID)
INSERT INTO `Project` (`ProjectID`, `name`, `status`, `created_at`, `userID`) VALUES
(1,'Orion','active','2025-09-30 11:00:00',1),
(2,'Nova','active','2025-09-30 11:01:00',2),
(3,'Quasar','archived','2025-09-30 11:02:00',3),
(4,'Pulsar','active','2025-09-30 11:03:00',4),
(5,'Nebula','active','2025-09-30 11:04:00',5),
(6,'Aquila','active','2025-09-30 11:05:00',6),
(7,'Lyra','archived','2025-09-30 11:06:00',7),
(8,'Vega','active','2025-09-30 11:07:00',8),
(9,'Sirius','active','2025-09-30 11:08:00',9),
(10,'Altair','active','2025-09-30 11:09:00',10);
```

```
-- 3) Agents (FK → Project.ProjectID)
INSERT INTO `Agent` (`AgentID`, `name`, `version`, `model`, `goal`, `ProjectID`) VALUES
(1,'Planner-A','1.0.0','gpt-4o','Plan research tasks',1),
(2,'Executor-B','1.1.0','llama-3','Execute pipelines',2),
(3,'Retriever-C','2.0.0','gpt-4o-mini','Retrieve evidence',3),
(4,'Analyst-D','1.0.1','mixtral','Analyze results',4),
(5,'Reviewer-E','1.2.0','gpt-4o','Review outputs',5),
(6,'Coordinator-F','1.0.2','llama-3','Coordinate tools',6),
(7,'Optimizer-G','2.1.0','gpt-4o','Optimize prompts',7),
(8,'Evaluator-H','1.3.0','gpt-4o-mini','Score answers',8),
(9,'Monitor-I','1.0.3','mixtral','Monitor runs',9),
```

```

(10,'Summarizer-J','1.4.0','gpt-4o','Summarize logs',10);

-- 4) Runs (FK → Agent.AgentID, self-FK Parent_RunID → Run.RunID)
INSERT INTO `Run` (`RunID`, `Status`, `time`, `notes`, `Parent_RunID`, `AgentID`) VALUES
(1,'queued','2025-09-30 12:00:00','initial run',NULL,1),
(2,'running','2025-09-30 12:05:00','pipeline executing',NULL,2),
(3,'succeeded','2025-09-30 12:10:00','baseline complete',NULL,3),
(4,'failed','2025-09-30 12:15:00','tool error',NULL,4),
(5,'canceled','2025-09-30 12:20:00','aborted by user',NULL,5),
(6,'running','2025-09-30 12:25:00','child of run 2',2,2),
(7,'queued','2025-09-30 12:30:00','child of run 3',3,3),
(8,'succeeded','2025-09-30 12:35:00','retry success',4,4),
(9,'running','2025-09-30 12:40:00','monitoring',NULL,9),
(10,'queued','2025-09-30 12:45:00','summary pending',NULL,10);

-- 5) Environment (FK → Run.RunID)
INSERT INTO `Environment` (`EnvironmentID`, `Name`, `Framework`, `Python_Version`, `GPU_Cores`, `CPU_Cores`, `RunID`) VALUES
(1,'local-dev','PyTorch','3.10',0,8,1),
(2,'gpu-a100','TensorFlow','3.11',40,32,2),
(3,'colab-x','PyTorch','3.10',0,4,3),
(4,'dockergpu','JAX','3.11',16,24,4),
(5,'server-ml','PyTorch','3.9',0,16,5),
(6,'k8s-node-1','TensorFlow','3.11',24,32,6),
(7,'k8s-node-2','JAX','3.10',0,16,7),
(8,'ec2-g5','PyTorch','3.11',24,48,8),
(9,'onprem-v100','TensorFlow','3.8',16,24,9),
(10,'edge-nano','PyTorch','3.8',0,4,10);

-- 6) Datasets (FK → Project.ProjectID) (name unique per project)
INSERT INTO `Dataset` (`DatasetID`, `name`, `version`, `URL`, `type`, `ProjectID`) VALUES
(1,'news-corpus','v1','https://data.example.com/news-v1','text',1),
(2,'images-animals','v2','https://data.example.com/animals-v2','image',2),
(3,'qa-benchmark','v1','https://data.example.com/qa-v1','tabular',3),
(4,'logs-app','v3','https://data.example.com/logs-v3','logs',4),
(5,'audio-commands','v1','https://data.example.com/audio-v1','audio',5),
(6,'video-scenes','v1','https://data.example.com/video-v1','video',6),
(7,'finance-tables','v2','https://data.example.com/fin-v2','tabular',7),
(8,'wiki-snap','v1','https://data.example.com/wiki-v1','text',8),
(9,'product-images','v1','https://data.example.com/prodimg-v1','image',9),
(10,'code-snippets','v1','https://data.example.com/code-v1','text',10);

-- 7) RunStep (weak entity, PK = (RunID, Step_No), FK → Run.RunID)
INSERT INTO `RunStep` (`RunID`, `Step_No`, `Name`, `Status`, `Step_Type`, `Time`) VALUES

```

```
(1,1,'plan task','ok','plan','2025-09-30 12:00:10'),  
(1,2,'retrieve docs','ok','tool_call','2025-09-30 12:00:20'),  
(1,3,'observe results','pending','observe','2025-09-30 12:00:30'),  
(2,1,'plan pipeline','ok','plan','2025-09-30 12:05:10'),  
(2,2,'run tool A','ok','tool_call','2025-09-30 12:05:30'),  
(2,3,'revise prompt','ok','revise','2025-09-30 12:05:50'),  
(2,4,'run tool B','ok','tool_call','2025-09-30 12:06:10'),  
(3,1,'baseline plan','ok','plan','2025-09-30 12:10:05'),  
(3,2,'execute baseline','ok','tool_call','2025-09-30 12:10:20'),  
(4,1,'plan retry','error','plan','2025-09-30 12:15:10');
```

-- 8) RunMetric (PK = ID, FK → Run.RunID)

```
INSERT INTO `RunMetric` (`ID`, `RunID`, `Name`, `Value_Text`, `DataType`, `Value_Numeric`)  
VALUES  
(1,1,'latency_ms',NULL,'numeric',1200),  
(2,1,'notes','good recall','text',NULL),  
(3,2,'tool_calls',NULL,'numeric',5),  
(4,3,'accuracy',NULL,'numeric',0.82),  
(5,4,'error_msg','timeout on tool B','text',NULL),  
(6,5,'canceled_by','user','text',NULL),  
(7,6,'latency_ms',NULL,'numeric',950),  
(8,7,'score',NULL,'numeric',0.67),  
(9,8,'throughput',NULL,'numeric',120.5),  
(10,9,'status_note','monitoring stable','text',NULL);
```

-- 9) Artifact (PK = ArtifactID, FK → Run.RunID)

```
INSERT INTO `Artifact` (`ArtifactID`, `Type`, `URI`, `Checksum`, `Created_at`, `RunID`)  
VALUES  
(1,'log','https://artifacts.example.com/run1/log.txt','abc123','2025-09-30 12:01:00',1),  
(2,'report','https://artifacts.example.com/run1/report.html','def456','2025-09-30 12:02:00',1),  
(3,'file','https://artifacts.example.com/run2/output.json','ghi789','2025-09-30 12:06:00',2),  
(4,'image','https://artifacts.example.com/run3/plot.png','jkl012','2025-09-30 12:11:00',3),  
(5,'log','https://artifacts.example.com/run4/error.log','mno345','2025-09-30 12:16:00',4),  
(6,'model','https://artifacts.example.com/run5/model.bin','pqr678','2025-09-30 12:21:00',5),  
(7,'report','https://artifacts.example.com/run6/summary.html','stu901','2025-09-30 12:26:00',6),  
(8,'file','https://artifacts.example.com/run7/metrics.json','vwx234','2025-09-30 12:31:00',7),  
(9,'image','https://artifacts.example.com/run8/chart.png','yza567','2025-09-30 12:36:00',8),  
(10,'log','https://artifacts.example.com/run9/monitor.log','bcd890','2025-09-30 12:41:00',9);
```

COMMIT;