

IFT 530 – Advanced Database Management Systems

**Group 7**

**Final Project Summary**

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# Project Summary: Portfolio Management System

## Project Overview

The Portfolio Management System is a user-friendly tool built to help you stay on top of your stock market investments. It’s designed to make tracking, managing, and analyzing your portfolio simple and efficient, giving you real-time insights into your trading activities. Whether it’s monitoring your holdings, keeping tabs on market price changes, or analyzing past performance, this system has you covered.

With features like organized transaction records, up-to-date stock prices, and detailed portfolio summaries, you can easily keep track of your investments and make smarter trading decisions. The system also supports placing and managing different types of orders—like market, limit, and stop-loss orders—while keeping you informed about their status.

Built with reliability and scalability in mind, this platform ensures accurate trade recording and offers tools to help you spot market trends using historical data. It’s a powerful yet straightforward solution for anyone looking to take control of their financial portfolio management.

## Purpose & Benefit

The Portfolio Management System is built to streamline and automate investment tracking, trade execution, and market analysis. The system enables users to:

Manage investments by tracking stock holdings and account balances.

Execute trades by processing buy/sell transactions and pending orders.

Analyze stock performance using real-time and historical price data.

Assess investment risk based on portfolio holdings and market conditions.

By structuring financial data efficiently, the system supports both individual investors managing personal portfolios and financial analysts seeking data-driven insights for market research.

Benefit:

1. Real-Time Investment Tracking: Users can monitor their portfolio value, view past transactions, and analyze their stock holdings efficiently.
2. Efficient Trade Execution: The system ensures smooth processing of buy/sell transactions and order management.
3. Data-Driven Decision Making: Investors can use historical stock price trends to predict future movements and make informed trading decisions.
4. Risk Management: Helps users assess portfolio diversification and minimize risk exposure based on current market conditions.
5. Security & Accuracy: Ensures financial data integrity through well-defined constraints and relational dependencies between users, accounts, transactions, and market data.
6. Scalability: The system is designed to accommodate increasing trade volumes, stock price updates, and new user accounts as needed.

This Portfolio Management System serves as an essential tool for investors looking to optimize their trading strategies, enhance financial planning, and make smarter investment decisions in a dynamic stock market environment.

## Information Stored in the System

USERS TABLE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **SIZE** | **NULL / NOT NULL** | **CONSTRAINTS** | **PK** |
| USER\_ID | INT | - | NOT NULL | AUTO\_INCREMENT | YES |
| FIRST\_NAME | VARCHAR | 30 | NOT NULL | - | - |
| LAST\_NAME | VARCHAR | 30 | NOT NULL | - | - |
| EMAIL | VARCHAR | 150 | NOT NULL | UNIQUE | - |
| PHONE\_NUM | VARCHAR | 20 | NOT NULL | - | - |
| DOB | DATETIME | - | NOT NULL | - | - |
| CREATED\_AT | DATETIME | - | NOT NULL | DEFAULT CURRENT\_TIMESTAMP | - |

* PURPOSE OF THE COLUMNS
  + USER\_ID
    - Unique ID for Each User
  + FIRST\_NAME
    - First Name of the User
  + LAST\_NAME
    - Last Name of the User
  + EMAIL
    - Sign-Up/Contact Email
  + PHONE\_NUM
    - Emergency Phone Number
  + DOB
    - Date of Birth of User
  + CREATED\_AT
    - Account Creation Date

ACCOUNTS TABLE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **SIZE** | **NULL / NOT NULL** | **CONSTRAINTS** | **PK** |
| ACCOUNT\_ID | INT | - | NOT NULL | AUTO\_INCREMENT | YES |
| USER\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES USERS(USER\_ID) | - |
| ACCOUNT\_TYPE | VARCHAR | 30 | NOT NULL | CHECK (ACCOUNT\_TYPE IN (‘Personal’, 'Brokerage', 'Retirement')) | - |
| BALANCE | DECIMAL | 15,2 | NOT NULL | DEFAULT 0.00 | - |
| CREATED\_AT | DATETIME | - | NOT NULL | DEFAULT CURRENT\_TIMESTAMP | - |

* PURPOSE OF THE COLUMNS
  + ACCOUNT\_ID
    - Unique Account ID for the User
  + USER\_ID
    - LINKS to the Users Table
  + ACCOUNT\_TYPE
    - Type of Account (Personal, Brokerage, Retirement)
  + BALANCE
    - Account Balance
  + CREATED\_AT
    - Account Creation Date

STOCKS TABLE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **SIZE** | **NULL / NOT NULL** | **CONSTRAINTS** | **PK** |
| STOCK\_ID | INT | - | NOT NULL | AUTO\_INCREMENT | YES |
| SYMBOL | VARCHAR | 10 | NOT NULL | UNIQUE | - |
| COMPANY\_NAME | VARCHAR | 255 | NOT NULL | - | - |
| SECTOR | VARCHAR | 100 | NOT NULL | - | - |
| CURRENT\_PRICE | DECIMAL | 10,2 | NOT NULL | DEFAULT 0.00 | - |

* PURPOSE OF THE COLUMNS
  + STOCK\_ID
    - Unique Stock ID/Identifier
  + SYMBOL
    - The ‘Ticker’ Symbol Associated with the Stock
  + COMPANY\_NAME
    - Company Name
  + SECTOR
    - Industry the Company Operates In
  + CURRENT\_PRICE
    - Most Recent Stock Price

TRANSACTION TABLE (**FACT TABLE**)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **SIZE** | **NULL / NOT NULL** | **CONSTRAINTS** | **PK** |
| TRANSACTION\_ID | INT | - | NOT NULL | AUTO\_INCREMENT | YES |
| ACCOUNT\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES ACCOUNTS (ACCOUNT\_ID) | - |
| STOCK\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES STOCKS(STOCK\_ID) | - |
| TRANSACTION\_TYPE | VARCHAR | 10 | NOT NULL | CHECK (transaction\_type IN ('BUY', 'SELL')) | - |
| QUANTITY | INT | - | NOT NULL | CHECK (QUANTITY>0) | - |
| PRICE\_AT\_TRANSACTION | DECIMAL | 10,2 | NOT NULL | - | - |
| TOTAL\_VALUE | DECIMAL | 15,2 | NOT NULL | - | - |
| TIMESTAMP | DATETIME | - | NOT NULL | DEFAULT CURRENT\_TIMESTAMP | - |

* PURPOSE OF THE COLUMNS
  + TRANSACTION\_ID
    - Unique Transaction ID
  + ACCOUNT\_ID
    - LINKS to Accounts Table
  + STOCK\_ID
    - LINKS to Stocks Table
  + TRANSACTION\_TYPE
    - Indicates of the Transaction is a BUY or SELL
  + QUANTITY
    - Number of Shares Purchased/Sold
  + PRICE\_AT\_TRANSACTION
    - Price PER SHARE of the Stock when BOUGHT or SOLD
  + TOTAL\_VALUE
    - Computed as quantity \* price\_at\_transaction
  + TIMESTAMP
    - Time of Transaction

PORTFOLIO HOLDINGS TABLE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **SIZE** | **NULL / NOT NULL** | **CONSTRAINTS** | **PK** |
| PORTFOLIO\_ID | INT | - | NOT NULL | AUTO\_INCREMENT | YES |
| ACCOUNT\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES ACCOUNTS(ACCOUNT\_ID) | - |
| STOCK\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES STOCKS(STOCK\_ID) | - |
| QUANTITY | INT | - | NOT NULL | CHECK (QUANTITY>=0) | - |
| AVERAGE\_PRICE | DECIMAL | 10,2 | NOT NULL | - | - |

* PURPOSE OF THE COLUMNS
  + PORTFOLIO\_ID
    - Unique Portfolio ID
  + ACCOUNT\_ID
    - LINKS to Accounts Table
  + STOCK\_ID
    - LINKS to Stocks Table
  + QUANTITY
    - Number of Shares CURRENTLY Held
  + AVERAGE\_PRICE
    - Weighted Average Buy Price

MARKET PRICES TABLE (**FACT TABLE**)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **SIZE** | **NULL / NOT NULL** | **CONSTRAINTS** | **PK** |
| PRICE\_ID | INT | - | NOT NULL | AUTO\_INCREMENT | YES |
| STOCK\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES STOCKS(STOCK\_ID) | - |
| PRICE | DECIMAL | 10,2 | NOT NULL | - | - |
| TIMESTAMP | DATETIME | - | NOT NULL | DEFAULT CURRENT\_TIMESTAMP | - |

* PURPOSE OF THE COLUMNS
  + PRICE\_ID
    - Unique Price Record ID
  + STOCK\_ID
    - LINKS to Stocks Table
  + PRICE
    - Stock Price at the Recorded Time
  + TIMESTAMP
    - Time of Price Recording

ORDERS TABLE (**FACT TABLE**)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **SIZE** | **NULL / NOT NULL** | **CONSTRAINTS** | **PK** |
| ORDER\_ID | INT | - | NOT NULL | AUTO\_INCREMENT | YES |
| ACCOUNT\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES ACCOUNTS(ACCOUNT\_ID) | - |
| STOCK\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES STOCKS(STOCK\_ID) | - |
| ORDER\_TYPE | VARCHAR | 10 | NOT NULL | CHECK (ORDER\_TYPE IN ('Market', 'Limit')) | - |
| PRICE | DECIMAL | 10,2 | NOT NULL | - | - |
| QUANTITY | INT | - | NOT NULL | CHECK (QUANTITY>0) | - |
| STATUS | VARCHAR | 15 | NOT NULL | CHECK (STATUS IN ('Pending', 'Executed', 'Canceled')) | - |
| TIMESTAMP | DATETIME | - | NOT NULL | DEFAULT CURRENT\_TIMESTAMP | - |

* PURPOSE OF THE COLUMNS
  + ORDER\_ID
    - Unique Order ID
  + ACCOUNT\_ID
    - LINKS to Accounts Table
  + STOCK\_ID
    - LINKS to Stocks Table
  + ORDER\_TYPE
    - Indicates if the User Triggered a ‘Market’ or ‘Limit’ BUY or SELL Order
  + PRICE
    - Target Price (ONLY FOR LIMIT ORDERS)
  + QUANTITY
    - Number of Shares
  + STATUS
    - Order Status
  + TIMESTAMP
    - Time Order was Placed
* PORTFOLIO\_STATEMENTS TABLE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COLUMN NAME** | **DATA TYPE** | **SIZE** | **NULL / NOT NULL** | **CONSTRAINTS** | **PK** |
| STATEMENT\_ID | INT | - | NOT NULL | AUTO\_INCREMENT | YES |
| ACCOUNT\_ID | INT | - | NOT NULL | FOREIGN KEY REFERENCES ACCOUNTS(ACCOUNT\_ID) | - |
| TOTAL\_VALUE | DECIMAL | 18,2 | NOT NULL | - | - |
| STATEMENT\_DATE | DATETIME | - | NOT NULL | DEFAULT CURRENT\_TIMESTAMP | - |

* PURPOSE OF THE COLUMNS
  + STATEMENT\_ID
    - Unique ID for Each Statement
  + ACCOUNT\_ID
    - LINKS to Accounts Table
  + TOTAL\_VALUE
    - Computed Value from PORTFOLIO\_HOLDINGS \* CURRENT\_PRICE
  + STATEMENT\_DATE
    - Date the Statement was Generated