DATABASE DESIGN

SUBMISSION 1

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Contents

Introduction

This document outlines how the database has been designed, what software will be used to build the database, database functionality and includes details about table relationships, as well as a client sign off form.

Choose which database you will use to hold the data, and document your choice explaining the benefits and possible downfalls

I've chosen to use Microsoft SQL Server Express to build and hold the database. In addition to Microsoft SQL Server Express being free to use, it also has some great features such as;

- Having Microsoft support with updates and patches
- It's built on SQL Server which means it will be compatible with another edition of SQL Server, making the database more easily scalable
- Supports backup and restore
- Includes security features
- Monitoring tools
- Version can easily be upgraded to a paid edition

The most obvious potential downfall of using Microsoft SQL Server Express would be the imposed resource limitations; database size is limited to 10GB, as well as memory and CPU limitations. If the database grows in size too rapidly, this will quickly become a problem, although as mentioned above, the version can be upgraded to a paid version without the restriction quite easily.

Microsoft SQL Server Express does not include a SQL Server Agent, which is a service that is used for scheduling routine tasks. If required, a different program will need to be used for scheduling such as Windows Task Scheduler.

Describe the functionality of the database and include details of the information that will be stored in the database

Using transaction management, the database will ensure that data is updated correctly and according to the ACID (Atomicity, Consistency, Isolation, Durability) properties, which are that; updates will either be performed completely, or not at all, it must alter the database from one constant state to another constant state, it must execute transactions independently of one another, and ensure that completed transactions are recorded permanently in the database.

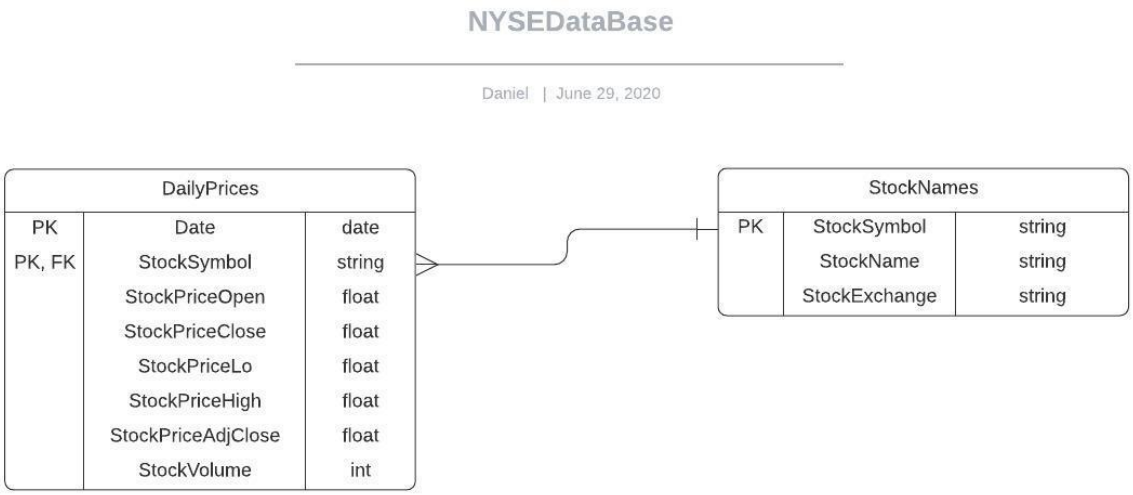
The database will be accessible 24/7 with the exception of routine maintenance and updates which may be performed at scheduled times, compliant with the needs and schedule of our client.

Contained within the database will be two main entities. The first entity which is named "DailyPrices" will contain records for stock prices. Each record will contain a date, a stock symbol relating to another entity (which will store the stock name and stock exchange), and details for the price of that particular stock on that particular day.

The other entity will be labelled “StockNames” and each record will contain the stock name, stock symbol and stock exchange.

Produce diagrams that outline the database design, including:

An entity relationship diagram with primary and foreign keys



Data dictionary

DailyPrices

Name	Data Type	Data Size	Key	Nullable
Date	date		PK+	No
StockSymbol	string	char(3)	PK+, FK	No
StockPriceOpen	float			Yes
StockPriceClose	float			Yes
StockPriceLo	float			Yes
StockPriceHigh	float			Yes
StockPriceAdjClose	float			Yes
StockVolume	int			Yes

StockNames

Name	Data Type	Data Size	Key	Nullable
StockSymbol	string	char(3)	PK	No
StockName	string	varchar(100)		Yes
StockExchange	string	char(4)		Yes

Describe normalization processes for each table design

DailyPrices:

All fields contain atomic values, and therefore meets 1NF.

The StockExchange field is dependent on the Date field; however it is not dependent on the StockSymbol field. Therefore, the StockExchange field was removed from this table to meet 2NF. If needed, the data can be referenced via the StockNames table.

All non-key fields are independent, and therefore meets 3NF.

StockNames:

All fields are atomic, and meets 1NF.

There are no composite keys, so this table meets 2NF.

All non-key fields are independent, and meets 3NF.

Sign off document for client approval of the design

Client Approval and Sign-Off Form

Project Name:	NYSE Data Base
This Document is Issued by:	Daniel Stride
Date:	30/06/2020

This form is to confirm that the database design presented by SkillAgeIT meets all of the requirements.

Database Requirements:
Database needs to be accessible and retain the data, so that our client no longer needs to process .csv files one at a time. Database needs to be accessible 24/7 with the exception of scheduled routine maintenance.

Name:

Position held in company:

Signature:

Date:

References

https://www.mssqltips.com/sqlservertip/5527/deciding-to-use-sql-server-2017-express-edition/