School of Computing and Mathematical Sciences

Cover Sheet for Coursework 1

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Assignment: \_\_\_\_\_\_\_ Coursework 1\_\_\_\_\_\_

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Title

WalletMentor: A Desktop Application for Financial Management

# Abstract

WalletMentor is a sophisticated C# application developed in Visual Studio 2022, utilizing .NET 7 and MongoDB Atlas. It serves as a comprehensive tool for managing personal finances, offering features like income, expense, and budget tracking, and dynamic data visualization through LiveChart WPF. This report delves into its development process, architectural design, functionality, and future potential, highlighting the blend of advanced technology and user-centered design.

# Introduction

Project Overview

WalletMentor, developed in Visual Studio 2022 using C# and .NET 7, is a desktop application that facilitates meticulous financial tracking. It integrates MongoDB Atlas for cloud-based data storage and employs LiveChart WPF for intuitive data visualization.

# Objective

The primary goal is to harness WPF and C# capabilities to create a tool that simplifies money management, thereby aiding users in effectively managing their finances.

# Scope

The application focuses on monthly financial monitoring, featuring user-friendly interfaces for tracking income, expenses, and budget, and employs advanced data visualization techniques.

# Methodology

## Development Environment

Developed using Visual Studio 2022, C#, and .NET 7, WalletMentor integrates MongoDB Atlas for database management and LiveChart WPF for graphical data representation.

## Database Design

The application uses MongoDB Atlas, with a 'monthly\_report' collection, encompassing fields like month, year, income, expense, and budget, to efficiently store and retrieve data.

## User Interface Design

WalletMentor boasts a welcoming screen and a streamlined 4-tab interface, navigated through side buttons, ensuring a straightforward and engaging user experience.

# Application Architecture

## System Architecture

The system features four main modules - income, expenses, budget setting, and monitoring. Data is seamlessly transmitted to and from the MongoDB Atlas cloud server, with financial overviews presented through various LiveChart WPF graphs.

## Data Flow

User input for income, budget, and expenses is sent to the cloud upon interaction with the interface. The application either updates existing records or creates new ones, depending on the data's presence for the specified time frame.

# Functionality and Features

## Income, Expense, and Budget Tracking

WalletMentor allows users to accurately input and monitor their financial details, providing a clear picture of their fiscal health and facilitating effective budget management.

## Graphical Representation

LiveChart WPF is utilized to translate financial data into various interactive graphs, providing users with an insightful overview of their financial status.

# Testing and Quality Assurance

## Testing Strategy

The application underwent a series of rigorous tests, including unit and integration testing, to ensure its functionality and reliability.

## Quality Assurance Measures

Quality was maintained through comprehensive code reviews and performance testing, ensuring the application's robustness and efficiency.

# Security and Data Protection

## Data Security

Advanced encryption and secure communication protocols are implemented to protect sensitive financial data within MongoDB Atlas.

## User Privacy

WalletMentor adheres to strict privacy standards, using user data exclusively for financial management and ensuring confidentiality.

# Conclusion

WalletMentor successfully combines advanced technological solutions with user-friendly design to provide an effective financial management tool. Its robust architecture, secure data handling, and intuitive graphical representations affirm its value in personal finance management.

# Future Work and Challenges

## Potential Enhancements

Future developments include diversifying graph types and automating data entry, potentially using AI or account syncing, to enhance efficiency and accuracy.

## Addressing Challenges

Challenges in data structuring and security are anticipated with these enhancements, emphasizing the need for appealing visuals and robust data protection.