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**SCHOOL OF QUANTITATIVE SCIENCES**

**COLLEGE OF ARTS AND SCIENCES**

**UNIVERSITI UTARA MALAYSIA**

**SQITK3073**

**Business Analytic Programming**

**(A242)**

**INDIVIDUAL ASSIGNMENT (10%)**

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**DATE OF SUBMISSION:**

**08TH May 2025**

**Brief Technical Manual Report**

**Github link:** [**https://github.com/ovkent01/SQIT-3073-Business-Analytic-Programming-Individual-Project**](https://github.com/ovkent01/SQIT-3073-Business-Analytic-Programming-Individual-Project)

**1. Introduction**

This manual describes the functionality, setup, and usage of a simple **Personal Income Tax Calculator** system developed in Python.

This software is designed for every Malaysian household, allowing them to easily estimate their tax liabilities and gain a basic understanding before consulting professional advisors.

The application enables users to register, log in using their IC number, and compute annual income tax based on Malaysian tax policies. All records are stored locally in a CSV file.

**2. Objective**

* To provide a user-friendly console application for Malaysian households to estimate their personal income tax.
* To offer a basic understanding of income tax obligations before seeking professional advice.
* To support registration and login using IC number verification.
* To allow users to calculate tax based on simplified Malaysian tax policies.
* To store user tax records persistently in a CSV file.
* To ensure ease of access to past tax records while filtering out empty or zero-value entries.

**3. Background**

The system was developed as a university-level programming assignment, emphasizing the application of basic Python programming, file I/O operations, data persistence, and simple user interface design via the command line. The tax relief policy and tax bracket logic were simplified for educational purposes.

**4. Methodology**

The project consists of two main Python files:

* main.py - Acts as the entry point for the program and handles user interface interaction.
* functions.py - Contains helper functions for registration, login, tax computation, and CSV data manipulation.

**Workflow:**

1. User selects one of the main menu options: Login, Register, or Exit.
2. Upon login, the user is authenticated using the last 4 digits of their IC.
3. After login, the user can:
   * View their past tax records (filtered to exclude empty or zero-value rows)
   * Calculate tax and store the new record
   * Logout and return to the main menu

**Flow Chart**

Using a flow chart at the initial stage of development helped structure the program logically, enabling clear visualization of user interactions and system processes.

**A diagram of a flowchart

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**5. Initial Setup and Configuration**

**Requirements:**

* Python 3.x installed
* pandas library (install using pip install pandas)

**Installation Steps:**

1. Clone or download the project folder containing:
   * main.py
   * functions.py
   * autorun.cmd
   * requirements.txt
   * Flow Chart.drawio.png
   * README.md
   * tax\_data.csv
2. Double-click autorun.cmd to install requirements and run the program.

**6. Basic Operations**

**Register New User**

* User inputs a unique UserID and 12-digit IC.
* A new row is added to the CSV file with initial tax values set to zero.

**Login**

* User provides UserID and the last 4 digits of their IC number.
* Authentication checks for correct password (last 4 digits of IC).

**Tax Calculation**

* User enters their annual income.
* Tax relief is calculated based on income bracket.
* Final tax payable is computed and stored.

**View Tax Records**

* Displays user's past tax records.
* Rows with all tax-related values equal to 0 are excluded.

**7. Troubleshooting and FAQs**

**Q1: Program crashes at startup.**

* A: Ensure Python is installed and pandas is available. Use pip install pandas if necessary.

**Q2: Login failed even with correct credentials.**

* A: Double-check that the UserID matches the one used during registration. Password must be the last 4 digits of the IC.

**Q3: Tax records are not saving.**

* A: Check that the CSV file is not open in another program (like Excel). Close it and try again.

**Q4: IC number looks different after saving.**

* A: The IC column is saved as a string using dtype=str to prevent truncation. Ensure it is handled as text.

**8. References**

* *pandas - Python Data Analysis Library*. (n.d.). https://pandas.pydata.org/
* *Lembaga Hasil Dalam Negeri Malaysia*. (n.d.). Lembaga Hasil Dalam Negeri Malaysia. https://www.hasil.gov.my/en/
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