Birzeit University

Department of Electrical & Computer Engineering

Second Semester, 2023/2024

Computer Architecture

First Project – Medical Test Management System

Objective:

Develop a system in MIPS assembly to efficiently store, manage, and retrieve medical test data for individual patients. This system acts as a basic patient record management system focusing on test results.

File Format:

The medical test will be stored in text file. Each line in the text file represents a single medical test. The representation will include fields for:

- Patient ID (integer: 7 digits)
- Test name (string - consider a fixed length)
- Test date (string - fixed format like YYYY-MM)
- Result (floating-point value)

For example, the following file has two medical tests:

1300500: RBC, 2024-03, 13.5
1300511: LDL, 2024-03, 110

Medical Tests:

Below is the list of medical tests with their normal range:

1. Hemoglobin (Hgb): 13.8 to 17.2 grams per deciliter
2. Blood Glucose Test (BGT): Normal Range Between 70 to 99 milligrams per deciliter (mg/dL)
3. LDL Cholesterol Low-Density Lipoprotein (LDL): Normal Range Less than 100 mg/dL
4. Blood Pressure Test (BPT): Normal Range: Systolic Blood Pressure: Less than 120 millimeters of mercury (mm Hg). Diastolic Blood Pressure: Less than 80 mm Hg

System Functionality:

Develop a text-based menu that allows users to:

- Add a new medical test: the system will allow the user to store a new medical test with the required data. The system will check the validity of the input data.
- Search for a test by patient ID: the system will have the following functionality based on user selection:
    - Retrieve all patient tests
    - Retrieve all up normal patient tests

    - Retrieve all patient tests in a given specific period
- Searching for unnormal tests: the system will retrieve all up normal patients' tests based on the input medical test.
- Average test value: the system will retrieve the average value of each medical test
- Update an existing test result
- Delete a test

In addition to the above functionality, the system has capability for:

- **Error Handling:** Implement error handling for invalid file name, searching for non-existent tests, searching for non-existent patient, ….
- **Data Validation:** Validate user input to ensure proper data types (e.g., integers for ID, valid dates) and handle potential errors.

Submission:

Please submit the following:

1. Code
2. At least 2 testing examples.

Notes:

- Write the code for the MIPS program to satisfy the requirements described above and name the file as MedicalTest.
- Make sure your code is clean and well indented; variables have meaningful names, etc.
- Make sure your code has enough comments inserted to add clarity.
- Work in groups of at most **two** students
- Deadline: **Sunday,** 21 **April, 2024 at 11:59pm.** Please submit your project (code + test cases) through Ritaj as a reply to this message.
- This project is per group effort: instances of cheating will result in you failing the course.

Grading Policy:

Item	Points
Add new medical test and Data Validation	20
Search for a test by patient ID	30
Searching for unnormal tests	20
Update an existing test result	10
Delete a test	10
Average Value	15
Error Handling	15
Code structure	10
Discussion	20
Total	150