SWT11022: Practical for Fundamentals of Programming

Department of ICT
Faculty of Technology
South Eastern University of Sri Lanka

Academic Year: 2022/2023 Lab Sheet 01

Submission Date: 07/02/2025

Title: Introduction to the Fundamentals of Programming (Practical Environment).

Aims:

- Gain a foundational understanding of the programming environment and the basics of programming

Objective:

- Understand the installation of a C development environment and write and compile a basic C program.
- Understand the compilation process and demonstrate how C code is transformed into an executable program.
- Understand the fundamentals of GitHub for version control and collaboration.

Practical 1: Setting up the Programming / Development Environment

Steps:

1. **Install Notepad++:**
    - Go to below link

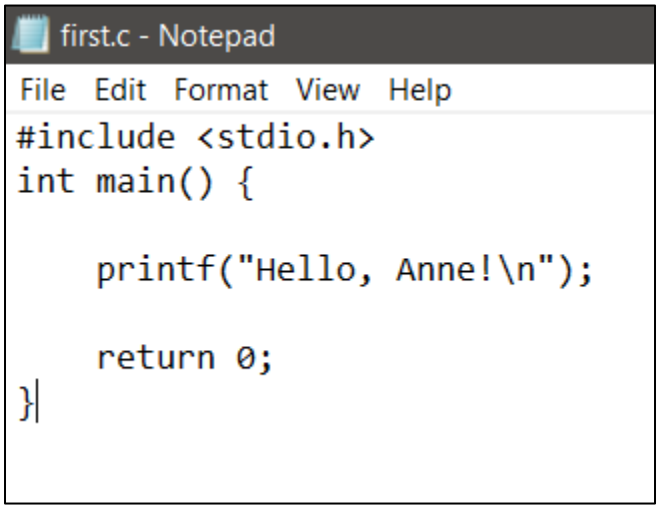
    https://notepad-plus-plus.org/downloads/
    - Click on latest version → Click on download button.
    - Once downloaded, click on exe file → click ok → Next → I Agree → Next → Next → Install → Next → Finish.

2. **Installation of GCC (GNU Compiler Collection):**
    - Go to below link.
      https://sourceforge.net/projects/gcc-win64/
    - Scroll down and click on latest version to download.
    - After completion, extract the Zip folder to the existing folder and cut paste to C drive.
    - Then go to this path → C:\gcc-14.2.0\bin and copy the path in address bar.
    - Set the folder path in System Environment Variable
    - To verify the installation, open command prompt and type → gcc --version

3. **Install the codeblock:**
    - Go to below link and scroll down to Microsoft Windows
      https://www.codeblocks.org/downloads/binaries/#google_vignette
    - Need to download “codeblocks-20.03mingw-setup.exe” file. Click on “Sourceforge.net” then it will download.
    - Go to folder and open downloaded file.
    - Clicking on Next → Agree →Next → Install → Next → Finish → Ok (automatically detect GCC compiler.

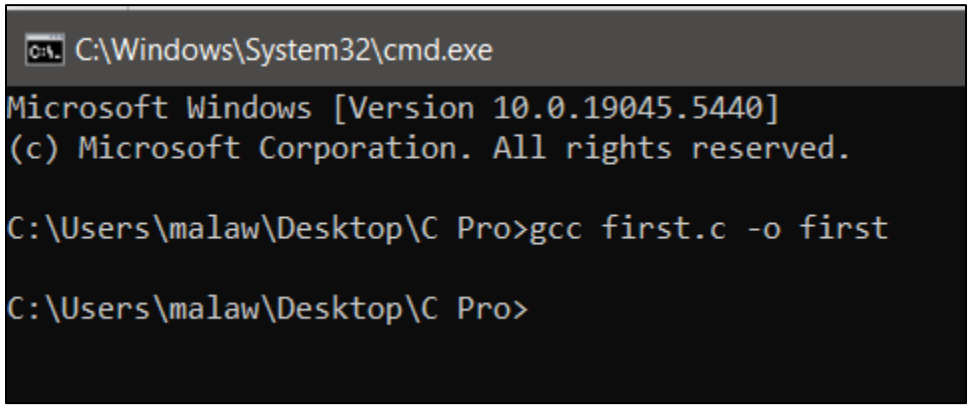
4. **Install MinGW:**
    - Go to below link
      https://sourceforge.net/projects/mingw/
    - Click on download.
    - Once it completed, click on MinGW setup and click on Install → Continue.
    - Click on continue and then select each of them and click on Mark for installation.
    - Once done, Click on Installation → Apply Changes → Apply.
    - Once installed successfully, click on Close →Close.
    - Set the path in System Environment Variable.
    - To verify installation type → g++ --version.

5. **Writing Your First C Program:**
    - Create a simple C program to print "Hello, [Name]!" to the screen.



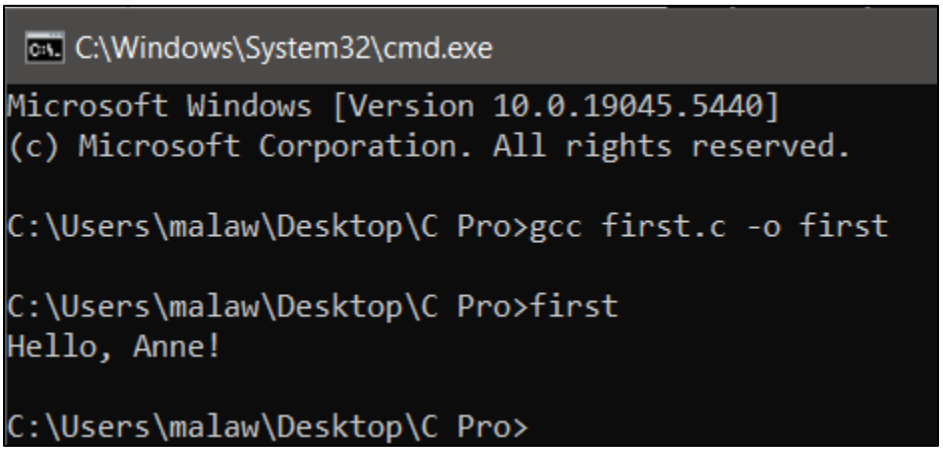
6. **Compiling the Program:**
    - Open your command prompt or terminal and navigate to the directory where they saved the C program.
    - Compile the program using the **gcc** compiler:

      gcc first.c -o first



    - This will generate an executable file named "first"
7. **Running the Program:**
    - Run the program using the file name:

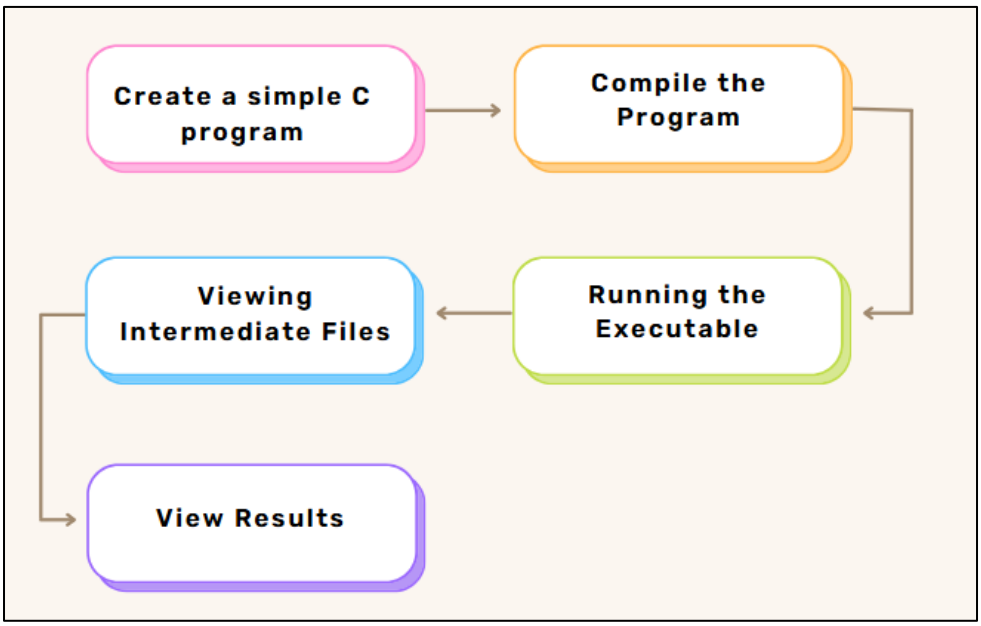
      first



8. **Observation and Verification:**
    - You will get the Output "**Hello, [your name]!**" displayed on the screen, indicating that the program ran successfully.

Practical 2: Compilation Process

Steps:



Practical 3: Introduction to GitHub

Prerequisites:

- A GitHub account.

Steps:

1. **GitHub Account Setup:**
    - Go to sign up for a GitHub account → https://github.com/signup
2. **Creating a Repository:**
    - Create a new repository on GitHub. You can name it something like "swt11022-2025"
3. **Repository Initialization:**
    - After creating the repository, provide a simple code file (e.g., a text file with some content).
4. **Cloning the Repository:**
    - Clone the repository to the local machine. Use the following command.

      git clone <repository-url>

5. **Making Changes:**
    - Make changes to the code file. You can add new lines, edit existing ones, or even create a new file.
6. **Adding and Committing Changes:**
    - To stage changes and commit them. Use the following commands:

    git add <file> git commit -m "Description of changes"

7. **Pushing Changes to GitHub:**
    - To push their committed changes to the GitHub repository. Use the following command:

    git push origin master

8. **Viewing Commit History:**
    - View the commit history. You can use:

    git log

9. **Creating a Pull Request:**
    - You should initiate a pull request to merge the changes into the main branch.
10. **Collaboration:**
    - Collaborative nature of GitHub. We can add multiple people who can work on the same project and contribute by creating branches, making changes, and merging them through pull requests.
11. **Merge the Pull Request:**
    - To merge their pull request to incorporate the changes into the main branch.
12. **Collaboration and Forking:**
    - Concept of forking and showing how we can fork repositories to contribute to open-source projects.

Exercise (Group)

- Write a C program that displays your name and registration number.
- Uses printf() to print the details in a structured format.
- Save it as studentRegNo_info.c
- Compile and test the program locally.
- Push the program to your GitHub repository.
- Create a new branch named feature-[studentRegNo] -info.
- Modify the program to include a welcome message before displaying the details.
- Open a pull request to merge the changes into master.
- Collaborate with a teammate to review and approve each other's pull requests.

Report Submission Guidelines

- The report must be submitted in PDF format.
- Use clear and professional language with proper grammar and formatting.
- Maintain a consistent font style (Times New Roman, 12 pt) and line spacing of 1.5.
- Include page numbers at the bottom of each page.
- The submission must be uploaded to the Learning Management System (LMS)
- The GitHub repository URL should be included in the report for verification.
- Submit the **PDF report** by **07/02/2025** via the LMS.
- Late submissions will not be accepted.

Report Structure

- Cover Page
    - Title: "Report on Practical for Fundamentals of Programming"
    - Name
    - Registration Number
    - Course Code: SWT11022
    - Department and Faculty
    - Date of Submission
- Introduction
    - Objective of the practical.
- Exercise
- Challenges
- Conclusion
    - Summarize what you learned from the practicals.
    - Discuss the importance of GitHub for software development.
- References