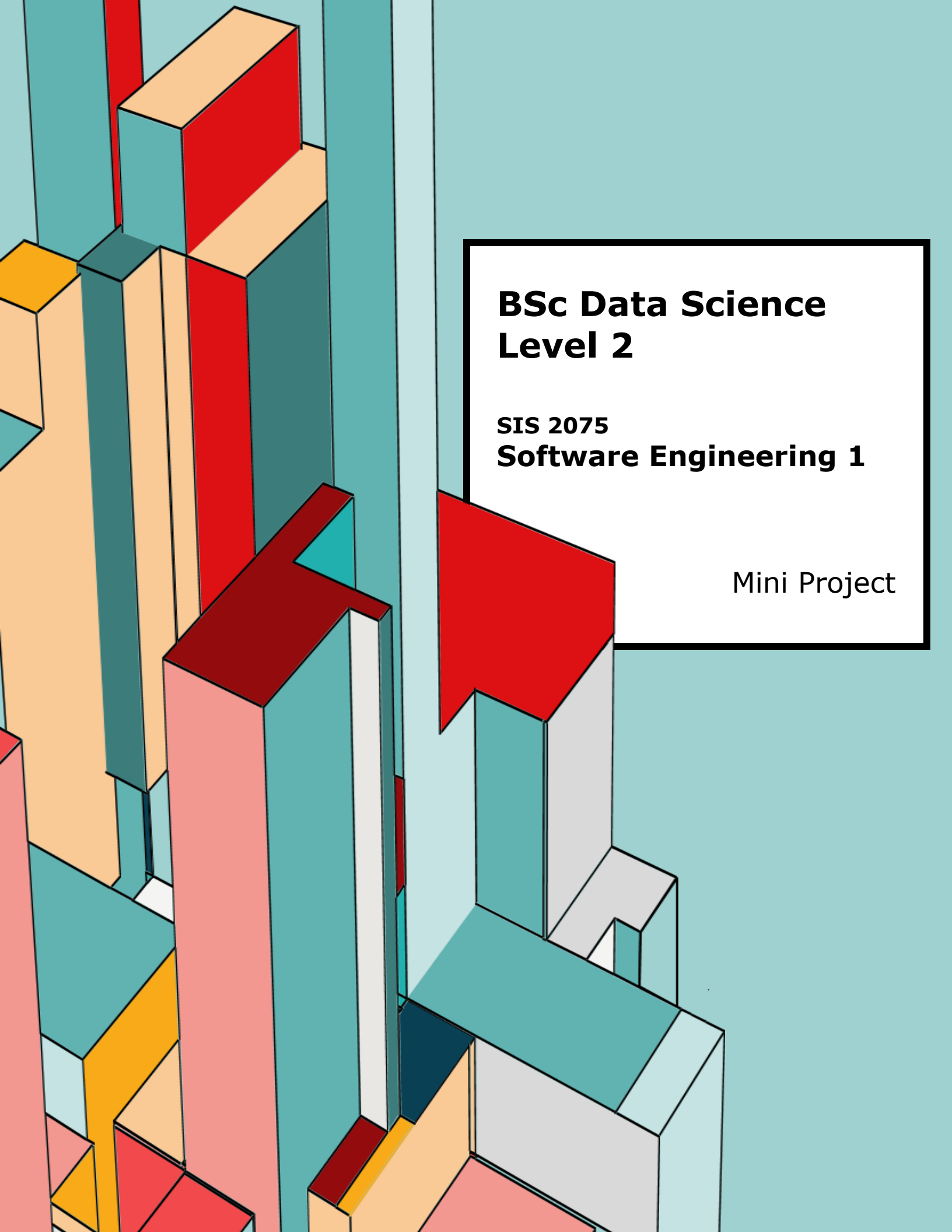

BSc Data Science Level 2

SIS 2075
Software Engineering 1

Mini Project

1. Software Development – A brief

Software production companies generally start by breaking down big projects into smaller and more manageable parts or modules. Different developer teams work on the different modules, unit test those modules and rework the programs if needed. Once all modules are ready, they are integrated into one whole system, tested again to see if the software answers to all its functional requirements and any remaining issues are resolved before deploying onto client's site. The whole time during the software development starting from the Requirement phase up to the Deployment phase, a dedicated testing team works alongside the developers to make sure that an acceptable level of quality exists in the software product before being handed over to the customer.

Different methodologies exist for software development, but Agile methodology is the most prominent one especially in Information Technology Outsourcing business model. Reason for this is that Agile Framework provides an iterative and flexible approach to software development and at the same time ensures faster and better results. This approach offers a platform where developers, testers and clients can all work in unison to come up with the best product that reflects what the customer really wants.

Throughout the agile software development, the different modules that are being developed by different developer teams undergo different changes through different iterative development. Consequently, different versions of the modules are being created and are managed using a Software Configuration Management (SCM) tool. Moreover, all development teams are provided with a common collaborative cloud platform onto which they can upload the different versions of the modules they are working on thus making their work visible to other teams in the same project.

2. Your Assignment

In this assignment, you will have to divide yourselves into groups of three students. Each group will act like as a Software Development Company (You can choose any name for your Company). Your task is to develop a complete software solution in C for a given problem. You can choose from any of the following proposals of you can come up with your own:

- Library System
- Online retail shop
- Computer shop
- Metro ticketing system
- Public transport ticketing system
- Car rental
- Agriculture Information System
- A Mathematical tool that can be used to do some complex calculations (e.g., Matrix operations, roots of polynomial equations, remainder theorem, etc…)

Note that the evaluation of the assignment will include an online demo and marking of your accompanying report.

Due Date: Week 10

Demo Presentation: tbc

2.1 Instructions

Follow the instructions below. They are also guidelines of what you will have to include in your report.

1. Once you have got your problem, you will have to design and implement your solution using the C language.
2. Break down your project into manageable modules that will be assigned to each member in the group.
3. Your program should include the use of your own defined libraries (**`.h`** files), functions, and files.
4. Use Visual Studio Code as code editor.
5. Use Git for version control and GitHub for collaborative work.

6. You should demonstrate how as a team you have managed:
    a. The different versions of the modules using Git.
    b. The uploading of the files on GitHub.
    c. How you have used push and pull features in VSCode to upload and download files from GitHub.
    d. Cloning of repositories.
7. You will be marked on the way you have used Git and GitHub, showing how they are the appropriate tools to use for version control and collaborative work.
    a. For Git, you will have to show how it helps in version control.
    b. You will also have to show all the different commands used and explain what those commands do. You can get a list of commands in the Git website. Your report should include the list of commands you have used, a description of each command and how you have used them.
    c. You will score more marks if you are able to show the use of more commands above the ones that have already been shown in the class. You will have to justify the use of those commands and how have you used them. Additional features that can be considered here are:
        i. Branching
        ii. Git ignore
        iii. Undo commits
        iv. … any other command/feature that you have deemed useful for your assignment.
    d. Marks will also be based on the use of GitHub as a collaborative cloud platform for software developers. You must show this in the demo as well document this in the report.
        i. Demonstrate how GitHub is the place to go for distributed software development.
        ii. How the platform helps developers who are scattered over different locations can still work together on a given project.
        iii. Show how members can be added in a project.
        iv. How GitHub helps in taking care of the different versions of the software.