

STUDENT INFORMATION SYSTEM

Student

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Course

System Programming

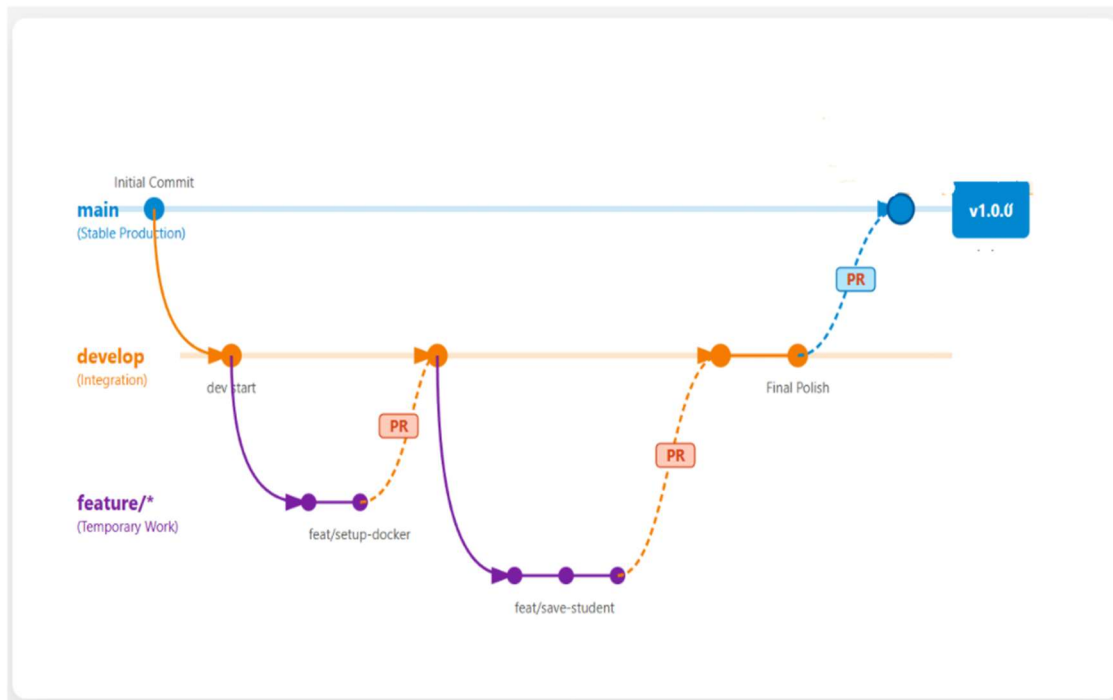
Techonogies & Tools

- **Programming** : C++ , libpqxx
- **Database** : PostgreSQL
- **Containerization** : Docker , Docker Compose
- **OS** : Ubuntu 24.04
- **Version Control** : Git , Github

Project Description

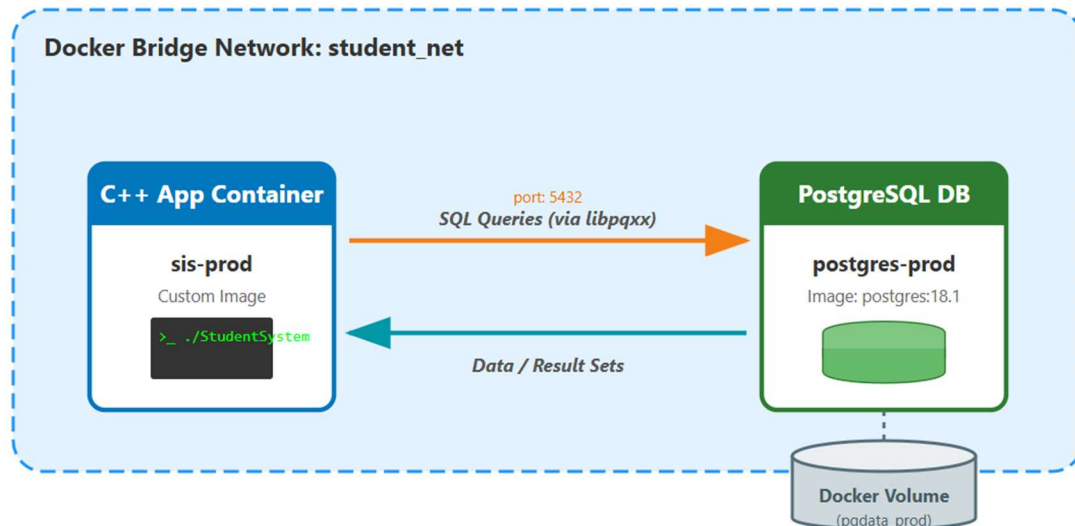
CLI student information management application preforms CRUD operations

Git Branching Strategy



- **Main** : Production
- **Develop** : All feature branches come from the develop branch
- **Feat/*** : Every feature has its own branch then must be merged to develop

System Architecture



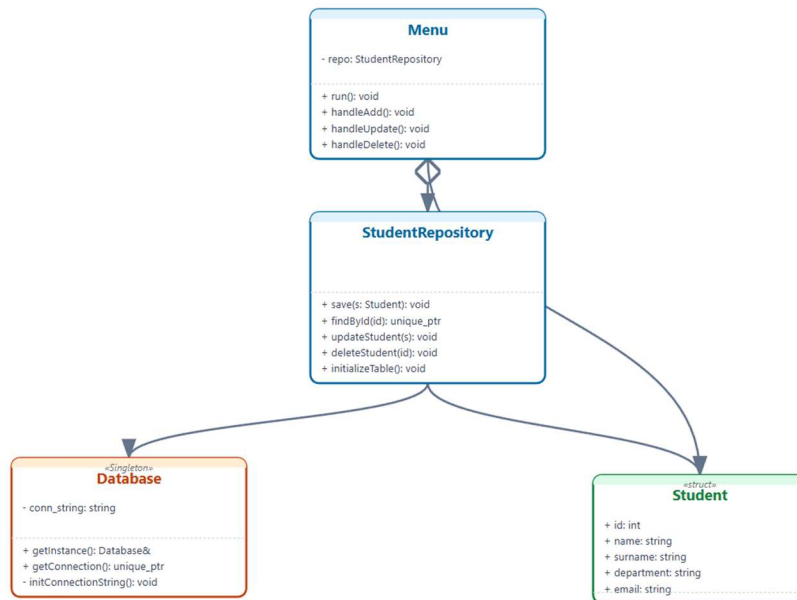
The project consist of two containers:

- **App Container**: All the code needed to display menu,connect with db,perform CRUD operations in app container
- **PostgreSQL DB** : The container contains the database
 - **Volumes** : pgdata_prod named volume to persistent data
 - **Network** : **student_net** bridge network used to enable app db
 - Connection

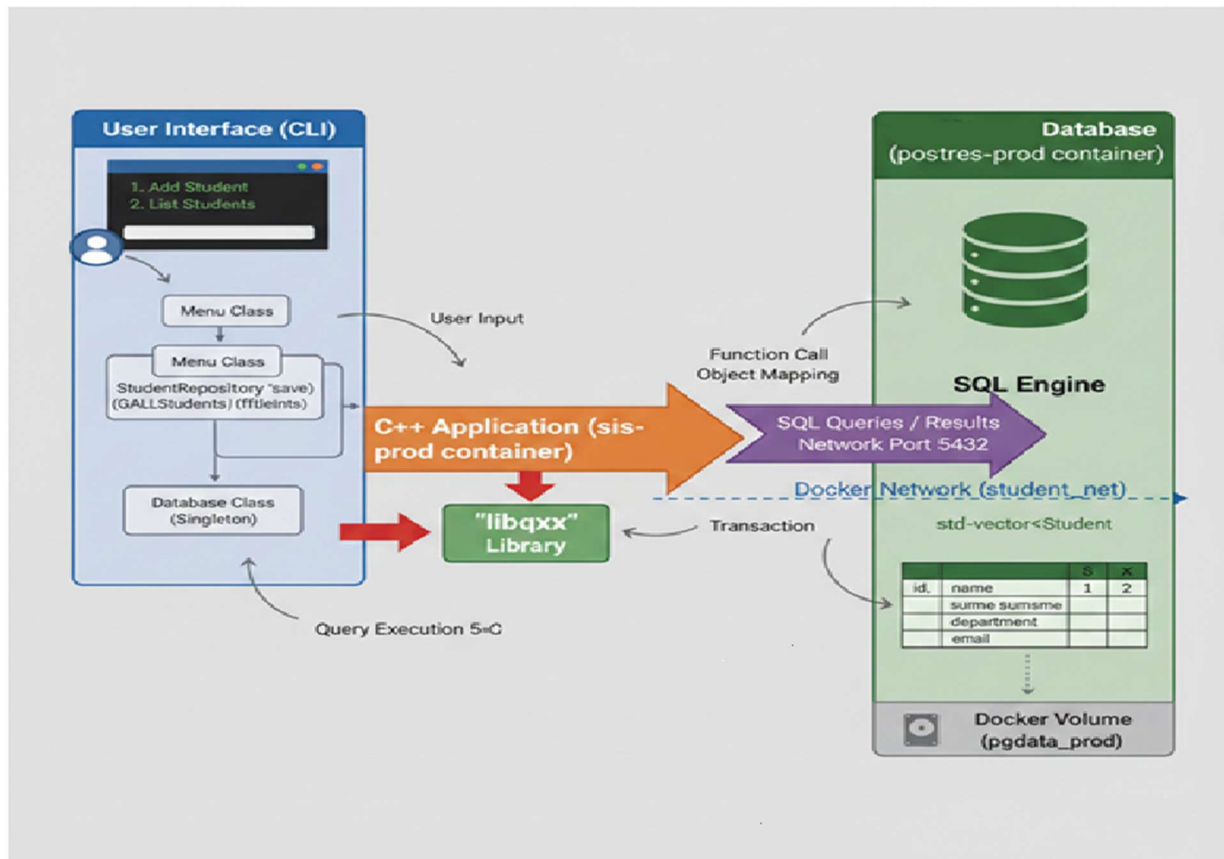
Project Diagram

SIS Project Architecture (v1.0.0)

System Programming Term Project Structure



Project Workflow



File Structrue

```
└─ include/
    └─ Student.hpp |
    └─ StudentRepository.hpp |
    └─ Database.hpp |
    └─ Menu.hpp |
└─ src/
    └─ main.cpp |
    └─ Menu.cpp |
    └─ StudentRepository.cpp |
    └─ Database.cpp | |
└─ docs/ |
    └─ CONTRIBUTING.md |
    └─ MANUAL.md |
    └─ INSTALL.md |
└─ Dockerfile
└─ docker-compose.yml
└─ .gitignore
└─ .dockerignore
└─ CMakeLists.txt
└─ README.md
```

App Snippets

```
ubuser@My-UBUNTU:~/projects/student-information-system$ docker compose up -d
[+] up 3/3
✓ Network student-information-system_student_net Created 0.2s
✓ Container postgres-prod Healthy 6.3s
✓ Container sis-prod Created 0.1s
ubuser@My-UBUNTU:~/projects/student-information-system$ docker compose exec app ./StudentSystem
[INFO] Table 'students' initialized.

=====
STUDENT INFORMATION SYSTEM (CLI)
=====
1. Add New Student
2. List All Students
3. Search Student by ID
4. Update Student Details
5. Delete Student
0. Exit
=====
Enter your choice: █
```

docker compose up --build -d

- Builds the image and initializes the network and the containers

docker compose exec app ./StudentSystem

- Runs the app