

STUDENT INFORMATION SYSTEM

Student

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Course

System Programming

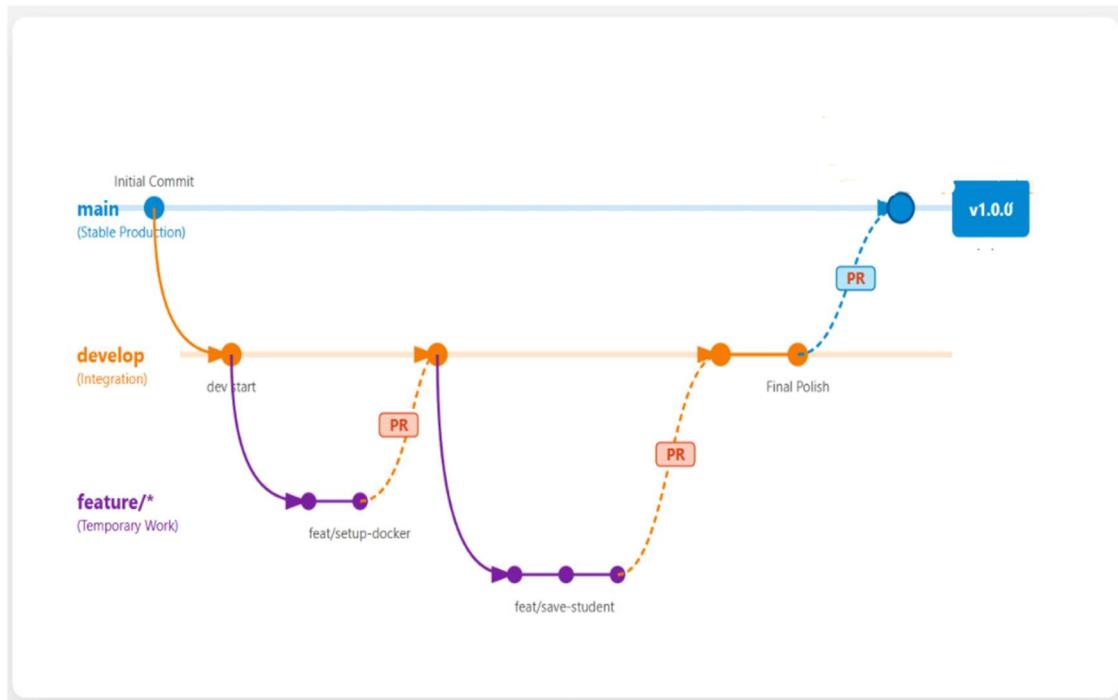
Techonogies & Tools

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

Project Description

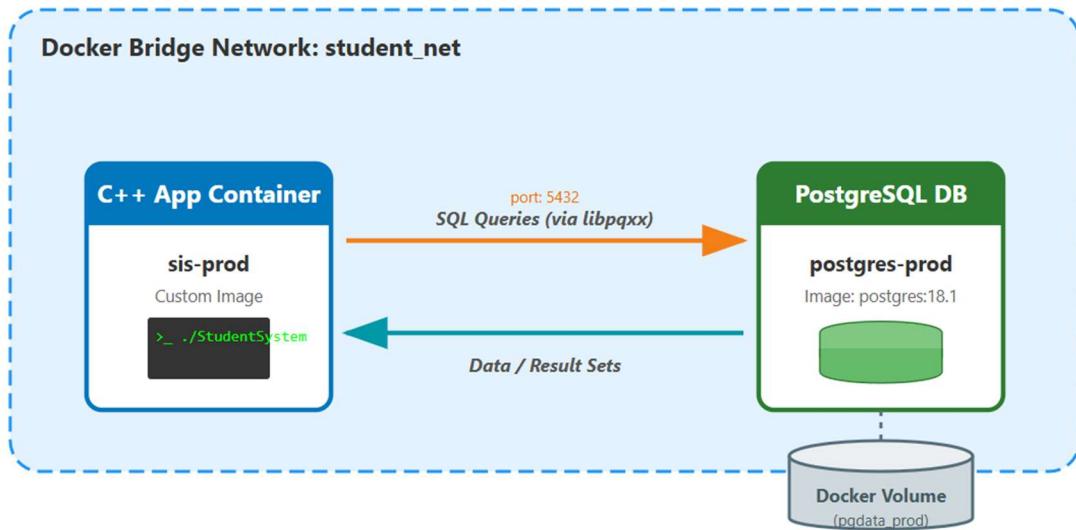
CLI student information management application performs CRUD operations

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

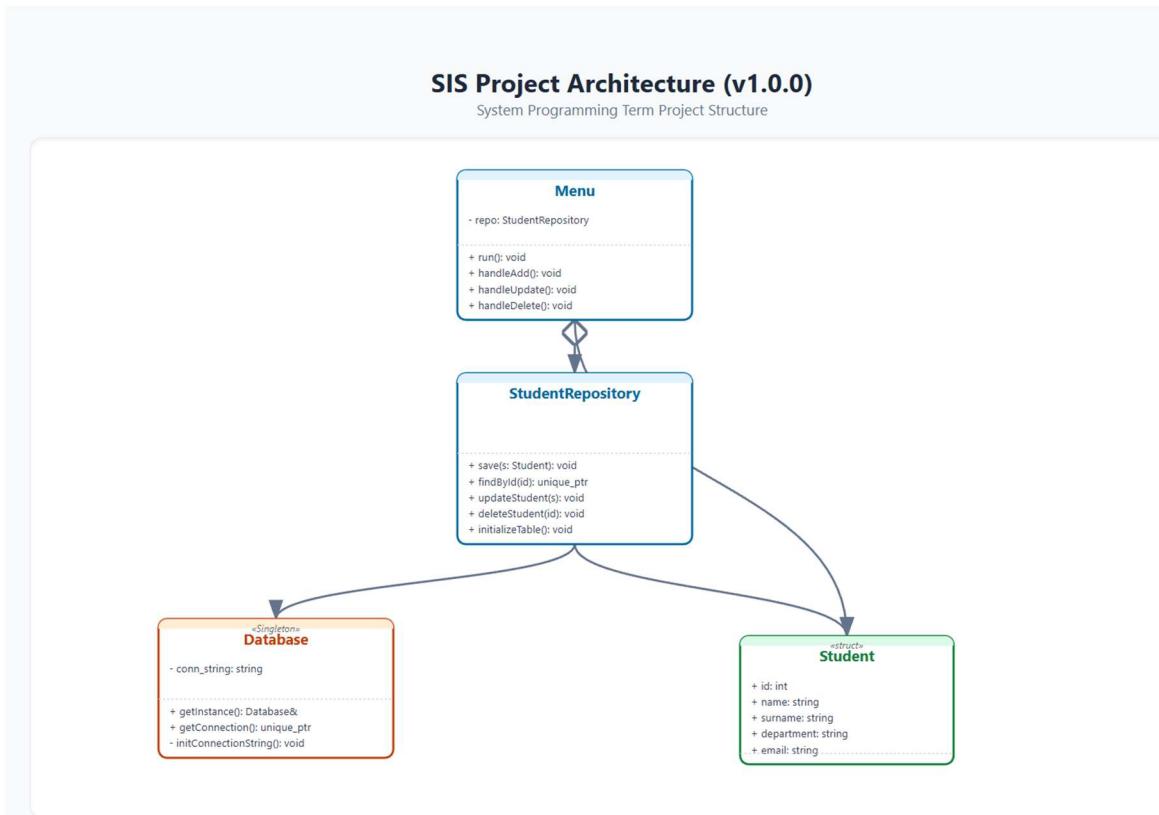
System Architecture



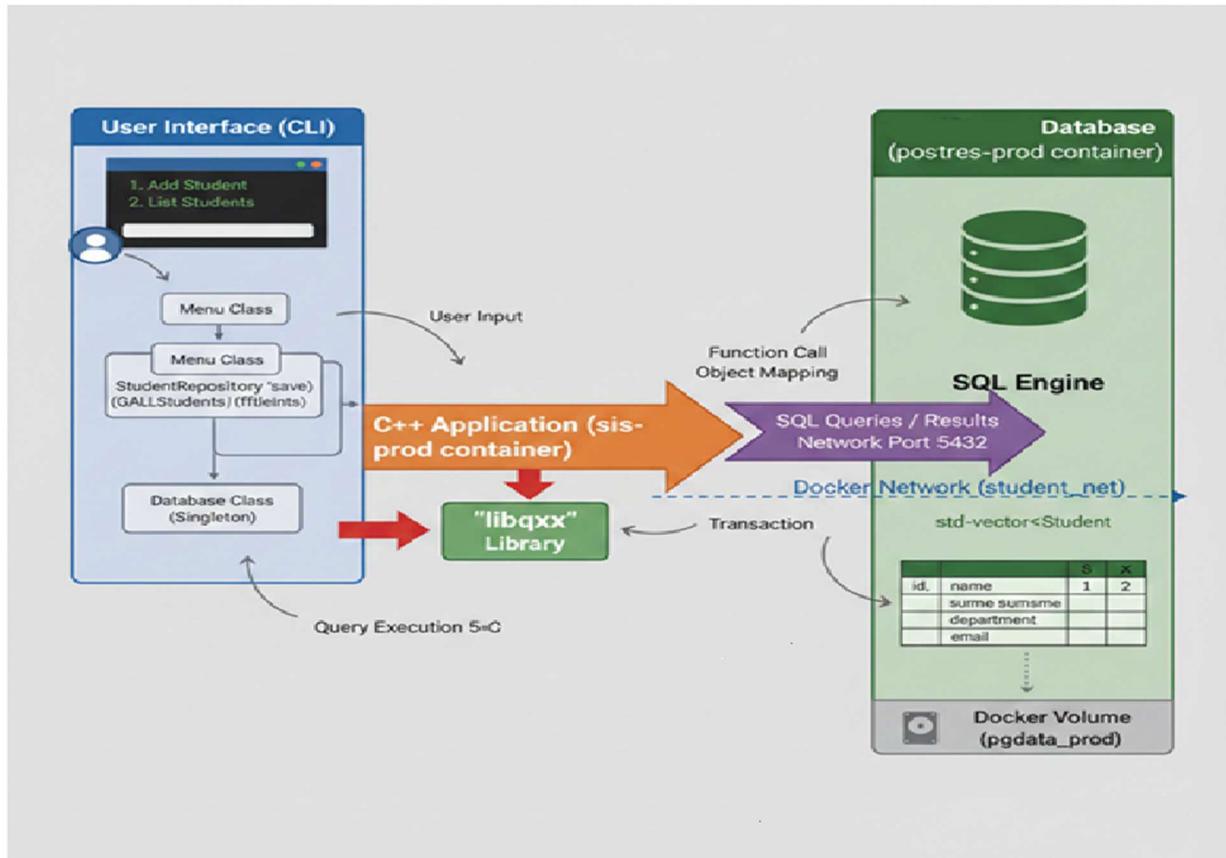
The project consists of two containers:

- **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



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: 1
```

docker compose up –build -d

- Builds the image and initializes the network and the containers

docker compose exec app ./StudentSystem

- Runs the app