



Group 29 – Microbiology Lab Information Management and Visualization System

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Overview



- ▶ Technical Advisor: Dr. Thomas Daniels
- ▶ Client: Karrie Daniels
 - ▶ Research Associate
 - ▶ Vet Microbiology and Preventative Medicine
- ▶ The system is designed to take in biological data from experiments and translate them into graphs to be exported and shared to other researchers.



Functional Requirements



- ▶ The system will import large amounts of data
 - ▶ Supports excel files, csv files from the user to the system
- ▶ The system will synthesize data into readable graphs and meaningful statistical information to be included in academic papers
 - ▶ Scatter Dot Plot
 - ▶ T-Test
 - ▶ P-values
 - ▶ Etc...
- ▶ The system will store and save backup data as well as the graphs to be compared to future experiments and maintain the integrity of experiments

Economic/Environmental Requirements

- ▶ For economical requirements:
 - ▶ Currently, there's no need to purchase access to software
 - ▶ Can experiment with NumPy and other libraries in Python which are free
 - ▶ If database or server is required, we can use Iowa State's resources for it
- ▶ For environmental requirements:
 - ▶ Software must maintain data values across computers and must not be dependent on one machine or input point
 - ▶ Software must account for human error and be both intuitive and safe to use so to not threaten the integrity of the data due to human error

Digital Design Standards

- ▶ Detailed Use Case Diagrams and User Stories to show the needs of the user
- ▶ Proper UML Diagrams to highlight the architecture of our design
- ▶ Create a technical manual describing the architecture and maintain and improve it throughout the project
- ▶ The architecture will be designed to be modular and easy to follow and organize

Software Development Standards

- ▶ Will use Agile techniques
- ▶ Will maintain a Trello board
- ▶ Weekly meetings with goals to accomplish for each person
- ▶ Each goal should be attainable given a week to complete it
- ▶ Use our GitLab repository for version control and collaboration

Documentation Standards



- ▶ Maintain technical documentation that clearly conveys the architecture, functionality, and interactions of the components of the code
- ▶ Maintain well documented and readable code within the individual files
- ▶ Maintain a User Guide for the Client and their peers
 - ▶ Orient the guide towards a non-technical audience