

Disease Simulations using the SIR model

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Chapter 1

Daily Activity

1.1 11/3

1. created github
2. emailed IT department

1.2 11/5

1. During agile development talk Came up with new project idea
2. researched relevant R code to simulate SIR disease prediction model
3. Dylan working on capturing graph output of R code with Java
4. Peter working on creating JFrame window that takes input for SIR model parameters

1.3 11/6

1. Discussed ways to get Rcode running through Java command line scripts
2. Decided to use older labs as basis for codebase

1.4 11/8

1. Need to create a wrapper around R script to run program using Java
2. Dylan gets Rscript to run by calling it through Java
3. Peter finishes basic JFrame window with input

1.5 11/10

1. Peter feels good :D, Dylan also feels good :D, Eli feels great!
2. Dylan and Peter upload work to github

11/13

1. Dylan finishes showing graph in Java window. Also fixed image size issue and potential errors by adding wait time to create file.
2. Task - add labels to text fields in JFrame window
3. Task - put SIR model png file in window

1.6 11/15

1. Researched current events related to disease modeling
2. improved JFrame user interface
3. finished burnup and burndown charts

1.7 11/17

1. read MAA SIR model paper
2. discussed possible further work

1.8 11/26

1. added Fashion disease model
2. worked on uml diagram

Chapter 2

Agile Development

2.1 Introduction

Agile development is a key component of our project. Every day before we get to work we discuss what we are currently working on and our goals for the day. We then divvy up the work based on our preliminary discussions. Another important aspect of Agile is responding to new ideas and the being ready to change. We recently had to make major changes to our project as our initial idea was no longer possible.

2.2 Principles of agile

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity—the art of maximizing the amount of work not done—is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

2.3 How we used these principles

Our first use of agile came after we emailed the IT department and they told us our initial idea. After discussing some new ideas we quickly changed the direction of our whole project. We came up with a new project our next class by communicating with each other and sharing all our ideas. Once we decided on a topic we split up the work evenly. We continued this process throughout development and kept tasks small and simple so they had less chance to break our project

Chapter 3

Motivations and Conclusion

3.1 Motivations

Given our extensive study of mathematical models early in the semester and our exposure to R an excursion into the SIR disease model was simply the next step for us. We wanted to immerse ourselves in a commonly used and excellent mathematical model. With its recent use as demonstrated by the article we read in class, the SIR disease model was a perfect fit. Additionally we already had experience with running R scripts using Java so we knew that a project such as this would be feasible.

3.2 Conclusion

Overall this project taught us a lot about Agile principles, disease modeling, and improved our java skills. We would like to thank Professor Bedi for his guidance and support.



