CSCD01 - Team Name:

# ‘Scrum Till You Waterfall’

Deliverable 1

Team 13

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# Software Development Process

What our group has chosen to follow the **waterfall** process of development for our next deliverable of our project. We came to this decision after considering all the different kinds of processes we could have potentially chosen and their pros and cons, which we illustrate as follows.

## Development Processes that were considered:

### Waterfall

The Pros and Cons of using Waterfall

Pros:

- With how short our sprints are, requirements don't really change, so we can just plan in the beginning
- We see ourselves planning prior to the development and not necessarily using the iterative nature of agile development
- We see ourselves completing tasks within sequence (planning, then testing,.....)

Cons:

- If there are any changes in requirements, (i.e. matplotlib decides to restructure their code base), then we have to redo our entire process

### Xtreme programming

The Pros and Cons of using Xtreme programming

Pros:

- Sense of whole team goals - We are in this together and we support each other's work and goals. This will improve each other in the team.
- Encourages sitting together or having more face time leading to higher productivity.
- Good for small teams - we have 5.
- Encourages pair programming to take turns coding and brainstorming every 30 mins.

Cons:

- Requires informative workspace with stories on a wall. Where do we find this wall so that everyone can see it during meetings?
- Slack - encourages the dropping of stories if getting behind. This should not be done as all the bugs need to be fixed.
- Requires a business side to interact with which we lack in the project.

**Test-driven Development**

<u>The Pros and Cons of using Testdriven</u>

Pros:

- For deliverables, we are already required to provide a suite of test cases, so it would be getting part of the deliverable out of the way earlier
- The test suite you prepare really provides a specification as to what you are building
- Easy to flush out any misunderstandings before actually touching the code

Cons:

- Tedious to do, especially when the software is complex, and you are unsure of exactly how all the components interact
- Could cost us a lot of initial time with all the mocking and stubbing we would need to perform compared to actually directly making the functional calls

**Scrum**

Not considered since we did it in CSCC01

**Kanban**

<u>The Pros and Cons of using Kanban</u>

Pros:

- Like the idea of developers pulling tasks from the board as they free up, rather than just being assigned all the tasks at the beginning
- With the board it is easy to see exactly who is working on what at any given moment (as long as members update the board as they go)
- There’s no real pressure to finish a certain task within a certain deadline (other than the overall looming deliverable deadline)

Cons:

- With tickets being pulled as they go, it is hard to forecast when all the tasks will be accomplished, and this could be a significant downfall as all the tasks will probably start being worked on near the deliverable deadline
- There may not be a sense of urgency to complete a task currently being worked on if there is not definitive timeframe
- Having to constantly manage a Kanban board could prove to be a chore especially for a team with few development tasks like this one

**Conclusion**:

In the end, our group carefully considered multiple options and we came to a consensus to use the **waterfall** development process for our CSCD01 project. Due to the upfront requirements being relatively strict, and the short deliverable timelines, we are not expecting too much change throughout a deliverable. Hence, we would like to use waterfall to gather all the requirements initially, design the bug fixes or features, implement, test, and then hopefully release. Waterfall especially makes sense for our team since we are not planning to meet daily or have a daily stand up. We are all understanding of the fact that we all have busy schedules and that the best approach is to split up tasks in the beginning and then set a firm deadline as to when tasks are due. Another reason we chose validation is that especially for our bug fixes, we know that the consumer validation criteria is pretty explicit in the bug tickets themselves, so we are at less risk of implementing something the consumer did not ask for. Also, as we will be working on multiple different bugs for the upcoming deliverable, we will not have to integrate too much code with other developers in the team and tasks can be worked on more independently. Additionally, since the documentation and architecture of matplotlib are not likely to change anytime soon, the waterfall process would allow our development team to be as efficient as possible in planning what we want to do, how we are going to do it, and validate and test what we developed all within strict workflow to accomplish what we want to do by the required deadline.

# Architecture of the System

## *Architecture Overview*

*(refer to "Overall Structure of the Architecture" for the following description)*

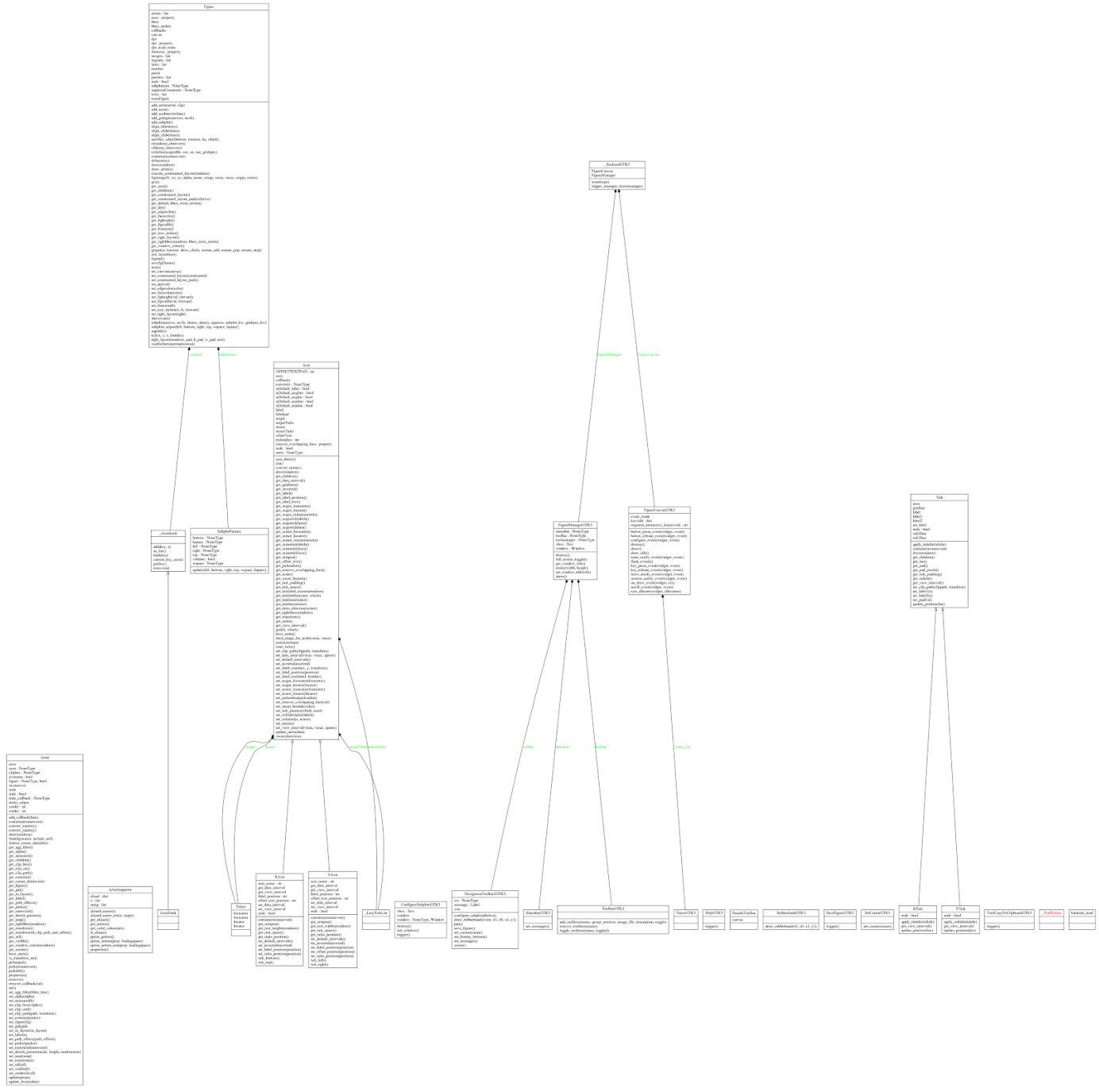
The architecture of Matplotlib focuses on creating, updating, and rendering Figure objects. To achieve this, there are 3 different layers, the Backend layer, the artist layer, and the scripting layer.

The **Backend layer** is an abstraction layer that provides logic to the components rendering the Figures. It includes base classes that are in charge of managing the canvas that the figures are drawn on (FigureCanvasBase), handling drawing operations (RendererBase), and handling events.

The **Artist Layer** is responsible for generating plots for the purpose of displaying, manipulating, and showcasing data visualization in a user friendly and accurate way, mainly using the (Artist) class. This layer utilizes different containers and primitive type objects that extend from (Artist) and collection classes that can be used to graphically represent different things within the (FigureCanvasBase) when instantiated.

The **Scripting layer** provides a user interface that allows users to easily interact with the Artist and Backend layer. It provides a syntax that users can use to generate Figures and display the graph on screen.

## ***Auto Generated UML***:



***Overall Structure of the Architecture UML:***