

Elizabeth Thompson

## **Final Project Written Report**

### **Introduction**

The goal of my final project is to create a dashboard that produces instructions, called a pattern, for knitting a drop shoulder sweater based on the user's inputted characteristics.

In the knitting community, many users will write a pattern that outlines how to make a sweater and list it online for free or a small profit. Although there is an abundance of patterns available, each pattern is designed for one specific sweater, contains instructions for every size, and are not editable. This can be overwhelming for beginning knitters and cause difficulty finding a pattern that fits knitter's desired customizations. This dashboard allows knitters to create their own patterns without purchase with their exact sweater characteristics.

It is fully customizable for sizing, neckline types, sleeves, optional embellishments, and yarn type, but are limited to the styles that I know how to knit. They are as followed:

Sizes: Small, Medium, Large, X-Large

Neckline types: Boat neck, Crew neck, Mock neck, Turtleneck

Sleeve types: Straight, Tapered, Balloon, Flare

Embellishment types: Ribbed edges, Ribbed collar, Ribbed edges and collar, No embellishments

### **Methods**

I used 3 different data sets to create this project, all created by me. The first is the small csv file called knit\_data.csv that contains the dropdown options. The second is a size dictionary that contains the necessary sweater measurements by size. These numbers were found by researching standard sweater measurements and adjusting as I saw fit. The last form of data is the pattern itself. This pattern was written from my personal experience of knitting a drop shoulder sweater and follows methods I used. The sweaters I have made have not been made using patterns but instead using intuition and past experience in knitting. The knit\_data.csv can be found in the data folder of the repository while the size dictionary and pattern are written into the SweaterPattern class in the pattern.py file.

The project is split into 3 files: dashboard.py, pattern.py, and main.py. The dashboard file contains all the code for the functions creating the dashboard. The run\_app function creates the dashboard and launches it in the terminal. The create\_layout function defines and outlines the components of the dashboard and adds them to the dashboard's layout. Create\_layout is called

inside `run_app` for clarity. The `update_image` function dynamically updates the sweater image on the dashboard based on the selected dropdown options. The `update_rib` function displays the necessary rib inputs based on the embellishment selection. The `update_edge` function displays the edge input based on the embellishment selection. The `update_collar` function displays the collar input based on the embellishment and neckline selections. The `update_size` function displays the sizing inputs if the user chooses to enter their own measurements rather than using the stored sizes. The `generate_pattern` function calls the `SweaterPattern` class from the `pattern.py` file to create the pattern based on the selections made on the dashboard and downloads the pattern as a pdf in the `patterns` folder. The `pattern.py` file defines a `sweater pattern` class for writing the pattern based on the user's inputs. The constructor defines all instance attributes needed for the pattern based on the user's inputs. It also calculates the increase and decrease variables if they are needed for the pattern. I used Margaret Corrigan's "Technical Editing for Knitting Patterns" website when I first made a tapered sweater and used the knowledge I gained to write the patterns for the tapered and flared sleeves. The `layout` function contains the written pattern and uses `if` statements to differentiate between the user's inputs. The `generate_pdf` function turns the pattern into a pdf and defines the customization I made to the pdf. These customizations include color, font, spacing, bolding, and underlining. The `main.py` file calls the `run_app` function.

The dashboard is created using `Dash` from `Plotly`. I referenced their website often to understand how to properly use the library. I also used `Flask` to save and return the pattern file. I originally used `Dash`'s `serve_pdf` function but was experiencing issues with the files downloading. After switching to `Flask`, the issues went away.

## **Demonstration**

To test my calculations, I decided to compare a handwritten pattern I made to one the dashboard would produce. I used the same measurements and characteristics that I chose when I knit the sweater and input them to the dashboard. This pattern is called Elizabeth's Sweater and is in the `patterns` folder in the repository. After checking the pattern against the calculations, I made when knitting the sweater, I found that the results were extremely similar. There were a few discrepancies, but this is because I started to knit my stitches looser after calculating and measuring, so my measurements were underestimated.

I intend to use this dashboard to make my subsequent knitting patterns and plan to add more dropdown options as I learn them. I have so far created two sweater patterns that I am planning to make, one for a friend and one for me. These are in the `downloads` folder as are called Ana's Sweater and Slouchy Sweater.

**Bibliography**

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