User Guide: SYPRO Orange Thermal Shift Assay Data Analysis

Purpose
The purpose of this code is to analyze data collected from a plate reading assay using the SYPRO Orange dye. The SYPRO Orange thermal shift assay is a method used to study protein stability and ligand binding. This assay measures changes in fluorescence as a protein is subjected to a temperature gradient, allowing the determination of the protein's melting temperature. It gives you a visualised plots for you to visualise the melting temperature curves and also tells you the precise point in numerical value of melting temperature.

Code Overview
The code is divided into two files: the "melting point plot code" and the "melting point code." Both codes read data from an Excel file, extract the relevant data for plotting, and perform specific analysis tasks related to the SYPRO Orange thermal shift assay.

Melting Point plot Code
This code is responsible for plotting the fluorescence values against the melting temperatures for different samples. It reads the Excel file, extracts the necessary data for each plot, and creates individual plots for each set of samples(the set of samples can be chosen) . The resulting plots show the fluorescence values against the melting temperatures for the specified samples.

Melting point Code
This code is responsible for finding the lowest fluorescence value and its corresponding melting temperature for each sample. It reads the Excel file, extracts the relevant data, identifies the lowest fluorescence value and its temperature for each sample, and prints these values on the console.

How to Use the Code
Follow the instructions below to use the code:

1. **Data Preparation**: Before running the code, ensure that you have an Excel file containing the data from the SYPRO Orange thermal shift assay. The file should contain two sheets: "Melt Region Temperature Data" and "Melt Region Derivative Data." Update the `file_name` variable in both code files with the name of your Excel file.

2. **Specify Data Ranges**: Open the Excel file and identify the appropriate data range for each code file. In the "melting point code," update the `data_sets` variable to specify the start and end rows for each set of samples you want to plot. In the "melting point plot," update the `data_sets` variable to specify the start and end rows for each set of samples you want to analyze.

3. **Run the Code**: Execute the code, and it will read the Excel file, extract the relevant data, and perform the desired analysis tasks.

4. **View and Customize the Output**: Depending on which code file you run, you will either see multiple plots showing the fluorescence values against the melting temperatures or printed values for the lowest fluorescence value and its corresponding melting temperature. Use the plot

window's features to zoom in/out, pan, and save the plots as images if desired. You can also customize the code to modify plot appearance (e.g., titles, labels, legends) or adjust the printed output to suit your preferences.

Note: Ensure that you have the necessary dependencies (`pandas`, `matplotlib`) installed to run the code successfully.

That's it! You can use this user guide to understand the purpose of the code and how to use it effectively for analyzing data from the SYPRO Orange thermal shift assay.