# Derivative Instrument Collections Manager – Ben Sandham

My collections manager will be based on financial derivatives, which are financial products that base their value on an underlying security.

## Requirements

### Core Functionality – Data Management:

* Ability to read data from CSV and JSON files
* Ability to write data to CSV and JSON files, e.g writing options that match a certain criteria to a CSV file.
* Ability to read and write to SQL Databases, e.g using SQLite
* Ability to rewrite specific data references
* Ability to “tag” specific securities based on fundamental and quantitative factors e.g Underlying Ticker, Contract Type (Call/Put), Strike, Expiry, Price, IV, Moneyness
* Ability to store multiple entries for each security to store changes in data, e.g ITM/OTM

### Performance Tracking:

* For any given derivative, the user should be able to:
  + Calculate the contract value
  + Find the change in contract value over 1H, 1D, 1W, 1Month time periods
  + Track delta, rho, gamma, vega, volGa, theta.
  + Track the risk of the option based on the Greeks
* Ability to create your own portfolio of “favourite” securities, stored on a separate page. This is to allow for easier tracking.

### Visualisation and UX/UI:

* Matplotlib will be used to provide graphical interpretations of price, IV, value.
* Seaborn will be used to generate a volatility surface model for the IV.
* We will use a website to present the UI. The link between the website and backend will be a Flask API, and the actual UI will be done with Streamlit.
* Integration with yfinance API to get real-time market news insights. This will be displayed on its own page with references for each relevant option.
* Visualisation of “winners” and “losers” of the day. E.g the top 5 securities with the highest daily gain, and the top 5 securities with the biggest daily loss.

## User Defined Use Cases

### User 1: Junior Quantitative Researcher at a Hedge Fund

* Profile: Quantitative Researcher working on US Equity Derivatives strategy research. Strong educational background.
* Desired Functionality: Full access to the Greeks and IV, detailed history of the Greeks/IV for strategy backtesting, notional risk calculation and visualisation, performance tracking. Export a selection to CSV.

### User 2: Owner of a non-financial business, part-time trader

* Profile: Risk conscious, limited time to trade and perform analysis, limited background in financial mathematics.
* Desired Functionality: Simple overview of options – potentially hiding some more complex data like the Greeks from view, basic view of risk, spacious and non-crowded interface.

### User 3: Professor of Finance at a University

* Profile: Highly educated researcher / lecturer
* Desired Functionality: Access to historical data about a given option, ability to export a set of data to CSV or JSON to further analyse with Python, plenty of visualisation for IV, Moneyness and Vol surfaces.

### User 4: Independent Retail Trader

* Profile: Strong contextual understanding of options, limited mathematical theory.
* Desired Functionality: Integration with real-time news platforms to better inform decision making, view of all options ranked by IV to identify potential opportunities, performance visualisation for securities in the portfolio / “favourited” securities.