Product Name: Financial Markets Platform
Team Name: LEEPS
Release Name: ~~**Release #1**~~ **Release #1.2**
Release Date: March 15, 2019
Revision number: ~~0.1~~ 0.2
Revision Date: 02/17/2019

Release Plan #1.2

High level goals:

1. I want to learn the economics and finance of high-frequency trading.
    a. Students read and discuss the fundamental readings for the project
    b. Students read and discuss more general papers in finance or experimental finance.
2. I want to build software that interacts directly with a market engine that can be used as a simulator of a financial market.
    a. First, being able to communicate with the market
    b. Second, being able to translate what the market responds and parse output data from market.
    c. Third, build a SIMPLE agent that can send orders and trade automatically with *exchange*.
    d. Fourth, set of agents that trade automatically representing many traders.
    e. Fifth, generate simulations and do basic analysis of data.
3. I want to be able to customize economics experiments software to conduct financial market experiments that are based in algorithmic trading.
    a. First, learn oTree
    b. Second, learn communication protocols and comm libraries (python)
    c. Third, be able to make slight modifications in the platform
    d. Fourth, be able to make major modifications in the platform.

High level Goals with associated User Stories:

1. As a Software Engineer, I want to learn the principles and rules governing stock market exchange, so I can work on the software facilitating it.
    a. **[8]** As a developer, I want to read and discuss the fundamental readings for the project: "*Flash Boys*" by Michael Lewis.
    b. **[13]** As a developer, I want to read and discuss more general papers in finance or experimental finance:
        - "*The High-Frequency Trading Arms Race: Frequent Batch Auctions as a market design response*" by E. Budish, P. Cramton, J. Shim
        - *"Experiments in High-Frequency Trading: Testing the Frequent Batch Auction"* by E. M. Aldrich and K. Lopez Vargas
2. As a prospective market exchange trader, I want to run bids and offers on the market engine so that I can understand how the market works and communicate with it.

a. **[5]** As a developer, I want to learn how to communicate with the market engine using the OUCH protocol.
b. **[5]** As a developer, I want to translate the market responses and parse output data from market.
c. **[8]** As a developer, I want to build a simple agent that can send orders from the OUCH client to the OUCH server and trade automatically.
d. **[21]** As a developer, I want to generate simulations and do basic analysis of data.
e. **[8]** As a developer, I want to be able to *Log* my history of cash, inventory, and orders.
    - set up a semi structured persistence data format (XML or JSON) (parsing for I/O)
    - figure out how to handle Sent, Confirmed, and Executed states
f. **[3]** As a developer, I want to be able to update my *Inventory* with orders
    - figure out how to handle Sent, Confirmed, and Executed states
g. **[8]** As a developer, I want to implement a robot that sends *Random* orders
    - create a client that buys / sells (5) orders at random during a (3) minute period with a random price and quantity
h. **[13]** As a developer, I want to implement a client that does the *Inventory* algorithm
    - create a client that makes buy/sell decisions based on the inventory incentive (as specified in the texts)
i. **[13]** As a developer, I want to implement a client that does the *Maker's* algorithm
    - create a client that makes buy/sell decisions based the Maker's algorithm in the texts
j. **[13]** As a developer, I want to implement a client that does the *Taker's* algorithm
    - create a client that makes buy/sell decisions based the Takers algorithm in the texts

3. As an end-user, I want to have an experimental platform to conduct financial market experiments with different market fundamentals
    a. **[3]** As a developer, I want to learn and understand the OTree python framework
    b. **[5]** As a developer, I want to learn how to use communication protocols and comm libraries from python
    c. **[8]** As a developer, I want to learn and understand how the existing software platform from the LEEPs team
    d. **[13]** As a developer, I want to modify the existing software platform from the LEEPS team

Product Backlog:

4. **[21]** As a developer, I want to create algorithmic trading programs to interact with the experimental market platform

User Stories for Release:

Sprint 1:

1. **[8]** As a developer, I want to read and discuss the fundamental readings for the project: "*Flash Boys*" by Michael Lewis.
2. **[13]** As a developer, I want to read and discuss more general papers in finance or experimental finance:
    a. "*The High-Frequency Trading Arms Race: Frequent Batch Auctions as a market design response*" by E. Budish, P. Cramton, J. Shim.
    b. "Experiments in High-Frequency Trading: Testing the Frequent Batch Auction" by E. M. Aldrich and K. Lopez Vargas.
3. **[5]** As a developer, I want to learn how to communicate with the market engine using the OUCH protocol.
4. **[3]** As a developer, I want to translate the market responses and parse output data from market.
5. **[8]** As a developer, I want to build a simple agent that can send orders from the OUCH client to the OUCH server and trade automatically.

Sprint 2:

1. **[8]** As a developer, I want to be able to *Log* my history of cash, inventory, and orders.
    a. set up a semi structured persistence data format (XML or JSON) (parsing for I/O)
    b. figure out how to handle Sent, Confirmed, and Executed states
2. **[3]** As a developer, I want to be able to update my *Inventory* with orders
    a. figure out how to handle Sent, Confirmed, and Executed states
3. **[8]** As a developer, I want to implement a robot that sends *Random* orders
    a. create a client that buys / sells (5) orders at random during a (3) minute period with a random price and quantity
4. **[13]** As a developer, I want to implement a client that does the *Inventory* algorithm
    a. create a client that makes buy/sell decisions based on the inventory incentive (as specified in the texts)
5. **[13]** As a developer, I want to implement a client that does the *Maker's* algorithm
    a. create a client that makes buy/sell decisions based the Maker's algorithm in the texts
6. **[13]** As a developer, I want to implement a client that does the *Taker's* algorithm
    a. create a client that makes buy/sell decisions based the Takers algorithm in the texts

Sprint 3:

1. **[3]** As a developer, I want to learn and understand the OTree python framework
2. **[5]** As a developer, I want to learn how to use communication protocols and comm libraries from python
3. **[8]** As a developer, I want to learn and understand how the existing software platform from the LEEPs team
4. **[13]** As a developer, I want to modify the existing software platform from the LEEPS team