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**Independent Study Proposal Form Timeline  
Honors Academic Cooperative 2389**

**Revised fall 2016**

***Your Academic Cooperative is an independent study/research course that you will register for and complete in the spring semester. However, you will prepare for the AC by completing your proposal in the fall semester.***

**Proposal timeline:**

1. September: Begin brainstorming academic areas that you would like to pursue. At this time, you are not expected to have specifics goals or topics. By the end of September, you should have your topic more focused. Be thinking about a particular professor with whom you would like to work for your independent study. Seek assistance from your mentor. Your Honors College Director will assist you with strategies for focusing your topic, finding a supervising professor for your AC, and with other questions or concerns that you grapple with during this process.
2. October: Prepare your objectives and rational for your research project. You must have your topic narrowed by this time. Your Honors College Director will provide assistance and resources for completing this portion of your proposal. Meet with your Honors College Director about finding an AC supervisor. You must also begin searching for all resources (people, publications, etc) you will need to complete your AC.
3. November: A portion of the November meeting will be devoted to writing a work plan/schedule and determining evaluation methods for grading your semester project (rubrics). Additionally, we have a date designated for proposal writing boot camp. On this day, you will complete a draft of your proposal.
4. December: Continue revising.
5. Meet with your Honors College Director prior to registering for your Academic Cooperative course. When you register for your other classes, please keep in mind that this is a three-hour, transferable Honors course.
6. Once you have registered for your AC 2389, notify the Honors College.
7. As soon as you are assigned a faculty supervisor, set up an initial appointment to introduce yourself and discuss what you are interested in learning. Share the proposal you are working on and seek feedback. This meeting MUST be conducted during the fall semester.

***Once the spring semester begins, complete the following steps.***

1. During the first week of the semester, schedule an appointment to meet with your AC 2389 supervisor. Seek feedback from your supervisor to see if final edits/changes need to be made. Make these final edits.
2. Both you and your supervisor must sign the proposal form by the second week of the spring semester.
3. Submit the completed document to the Honors College Director by the end of the second week of classes. Send an electronic copy and a hard copy.

Important: All ACs will require a literature review. The focus, length, style, etc. will be determined by you and your supervising professor. However, all literature reviews must be written in an academic style found in journals related to the discipline you are studying.



**PROPOSAL FOR INDEPENDENT STUDY**

**Honors Academic Cooperative 2389**

Name: \_\_\_Tristan Crowson and Joseph Quass\_\_\_\_\_\_\_\_\_\_

Student ID #: \_0456028\_\_\_\_\_\_\_\_\_

Email: \_\_\_tc0456028@students.mclennan.edu\_\_\_\_\_\_\_\_\_\_

Course Name/Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Title of Independent Study Project:

\_\_\_ Benchmarking the Cryptocurrency Market\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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The following should be completed by the **student and faculty supervisor.** Expand sections as needed in Microsoft Word.

**Objectives:**

1. Read literature on current events in the past year to view how they directly affect the top three cryptocurrency markets: Bitcoin, Litecoin, and Ethereum.
2. Review additional literature in the last three years on social, economic, and political events worldwide to assess how the effect on cryptocurrency markets and how future events can cause market shifts.
3. Develop necessary trading skills by evaluating and reading literature on current trading patterns found in both cryptocurrency markets so trends can be identified easier.
4. Further develop python coding abilities with PANDAS, scikitLearn, and other data analysis tools.
5. Collect open, closed, sold, bought, volume, and margin position prices of Ethereum, Litecoin, and Bitcoin from Poloniex.com from October 2017 until March 2018.
6. Develop a multi-level python analysis tool to quantitatively calculate Hui-Huebel liquidity rates, volatility, and statistical regression models to make mathematical market predictions.
7. Analyze results from the analysis tool to prove: liquidity rates are growing as the price per each coin grows and the respected volatility rates drop or vice versa.
8. Write a literature review on combining qualitative and quantitative market research predict future prices and validate the usage of cryptocurrencies as a currency/asset.
9. Prepare a poster for Scholars Day on March 23rd, 2018.

**Rationale:**

The recent creation and rise of cryptocurrencies has caused an entirely new debate about how currency works and should be handled. Economic experts are divided on calling cryptocurrencies such as Bitcoin an immensely beneficial game-changer or an irresponsible creation that threatens to undermine the world’s money exchanges as we know it. The purpose of the research is to determine the potential legitimacy of up and coming cryptocurrencies and create a market prediction as to their potential worth in the future.

Decentralized currency, thus far, has been incredibly volatile and hard to predict. This has caused more of a debate among economic experts as to the legitimacy of cryptocurrencies since they are so hard to predict and control. An important fact for the research to consider is the ever-changing stance governments are taking in regards to cryptocurrencies. For example, Russia wants to integrate cryptocurrencies into their common economic environment while China has outright banned all cryptocurrencies. As part of the market prediction, the current political and economic climate across the globe will have to be examined and taken into consideration.

Another problem with decentralized currency is the liquidity, the measure of how easy it is to use a currency to buy a product or service, of the currencies themselves. Current cryptocurrencies have varying liquidity rates as their ability to be used as a common method of purchase directly affects the market in, sometimes, drastic ways. Current research and tracking tools are ill-equipped to deal with these new currencies as all other methods of exchanging money are well-documented and established. As part of the research, custom tools will need to be built and specialized for the cryptocurrency market in order to gain quantitative data for the market prediction.

Houser, Kristin. “In the Age of Blockchain, Crypto Has a Major Problem.” Futurism, Future Society, 21 July 2017, futurism.com/the-age-of-blockchain-crypto-has-a-major-problem/

Selkis, Ryan. “The Easy Way To Measure Bitcoin's Fair Market Value: A Do-It-Yourself Guide.” Www.Investopedia.com, Investopedia, 2 Sept. 2014, www.investopedia.com/articles/investing/050914/easy-way-measure-bitcoins-fair-market-value-doityourself-guide.asp.

**Available Resources:**

* Dr. Alexandra Shiu, Economics professor
* Dr. Dulin, Honors College Director
* Professor Rush Hathi, Computer Science Director
* Highlander Undergraduate Research Institution
* Bitcoin, Litecoin, Ethereum Market Data - Poloniex.com
* Python Fundamentals - <https://www.learnpython.org/>
* Selkis, Ryan. “The Easy Way To Measure Bitcoin's Fair Market Value: A Do-It-Yourself Guide.” Www.Investopedia.com, Investopedia, 2 Sept. 2014, [www.investopedia.com/articles/investing/050914/easy-way-measure-bitcoins-fair-market-value-doityourself-guide.asp](http://www.investopedia.com/articles/investing/050914/easy-way-measure-bitcoins-fair-market-value-doityourself-guide.asp).
* Houser, Kristin. “In the Age of Blockchain, Crypto Has a Major Problem.” Futurism, Future Society, 21 July 2017, futurism.com/the-age-of-blockchain-crypto-has-a-major-problem/
* Roberts, J. J. (2017). 5 Big Bitcoin Crashes: What We Learned. Fortune.Com, 1. Retrieved from <https://ezproxy.mclennan.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=125225622&site=eds-live>
* Lan, X. (2017). Why Has China Banned Bitcoin Trading?. Beijing Review, 60(40/41), 48. Retrieved from <https://ezproxy.mclennan.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=125826492&site=eds-live>
* Popper, N. (2017, November 7). Price of Bitcoin Surges, Lifted by Hedge Funds. New York Times. p. B3. Retrieved from <http://link.galegroup.com/apps/doc/A513616220/SCIC?u=txshracd2526&xid=812954ff#.WjhuNS3rZaE.link>
* Donier, J., & Bouchaud, J. (2015). Why Do Markets Crash? Bitcoin Data Offers Unprecedented Insights. Plos ONE, 10(10), 1-11. doi:10.1371/journal.pone.0139356. Retrieved from <https://ezproxy.mclennan.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=110229780&site=eds-live>
* Technical Analysis of Bitcoin Charts – The Most Common Patterns. (2016, April 13). Retrieved December 19, 2017, from <http://www.bitcointradingsites.net/technical-analysis-bitcoin-chart-patterns/>
* Villar, S, Knight, S., & Wolf, B. (2014, February 25). Bitcoin Exchange Mt. Gox goes Dark in Blow to Virtual Currency. Retrieved from <http://fildr130.pbworks.com/w/file/fetch/75914555/Bitcoin%20Exchange%20Mt.%20Gox%20goes%20Dark%20in%20Blow%20to%20Virtual%20Currency.pdf>
* Schroeder, P., & Becker, B. (2014, March 26). IRS makes move to tax bitcoins. Hill. p. 12. Retrieved from <https://ezproxy.mclennan.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=f5h&AN=95252047&site=eds-live>
* Sarr, A., & Lybek, T. (2002, December 1). Measuring Liquidity in Financial Markets. Retrieved from <https://www.imf.org/external/pubs/ft/wp/2002/wp02232.pdf>

**Work plan/Tentative schedule:**

|  |  |
| --- | --- |
| Week | Task |
| Dec 10th - Dec 16th | Begin reading “5 Big Bitcoin Crashes: What We Learned,” and  “Why Do Markets Crash? Bitcoin Data Offers Unprecedented Insights.” Then compare the date of the event/crash to past market data to see how market prices were affected. Ensuring to take detailed notes of what caused the crash, when it was, and its related effect. Review python fundamentals and syntax. |
| Dec 17th - Dec 23th | Continue researching cryptocurrency events in the last year by reading “Why Has China Banned Bitcoin Trading?” and “Price of Bitcoin Surges, Lifted by Hedge Funds” to better understand how governments choose to interact with cryptocurrencies. Edit this proposal as to turn in a rough draft to Dr. Dulin. |
| Dec 24th - Dec 30st | Read “Bitcoin Exchange Mt. Gox goes Dark in Blow to Virtual Currency” and “IRS makes move to tax bitcoins.” After reviewing critiques, begin editing objectives, rational, resources, grading, and the tentative work schedule. |
| Dec 31st - Jan 6th | Study the “Technical Analysis of Bitcoin Charts – The Most Common Patterns.” Collect market data from October 2017 to December 2017 and convert data into a JSON file format. Ensure all testing data is cleaned and begin development of analysis tool. |
| Jan 7th - 13th | Develop market analysis tool to calculate liquidity and volatility rates. Test calculations with the subset of data. Write outline for literature review and collect sources into a single reference page. |
| Jan 14th - Jan 20th | Begin finalizing the development of the market analysis tool. Start writing literature review and abstract. Have first meeting with Professor Shiu on Wednesday to discuss progress and read over literature outline. |
| Jan 21st - Jan 27th | Collect data up until January 23rd and append that onto the collection of market information and run the tool. Meet with Professor Shiu on Wednesday to check progress and get critiques on quantitative methodology. |
| Jan 28th - Feb 3rd | Collect data up until January 30th and append that onto the collection of market information and run the tool. See Professor Shiu on Wednesday to read over a rough draft of the literature review and abstract. |
| Feb 4th - Feb 10th | Collect remaining January's market data and feed it into the tool to see new changes. On Wednesday, show Professor Shiu the results from the analysis tool so we can make critiques to the algorithm as needed. |
| Feb 11th - Feb 17th | Collect data up until February 13th and append that onto the collection of market information and run the tool. Meet with Professor Shiu on Wednesday to assess the accuracy of market predictions. |
| Feb 18th - Feb 24th | Collect data up until February 20th and append that onto the collection of market information and run the tool. Meet with professor Shiu to read over the second draft of the literature review. Also, have a general discussion about how the poster should be presented. |
| Feb 25th - Mar 3rd | Collect the rest of February's market data and again run it through the tool to see new results. On Wednesday, show Professor Shiu results from the market analysis tool and the overall predictions we have found. |
| Mar 4th - Mar 10th | Collect data up until March 6th and append that onto the collection of market information and run the tool. Edit the literature review as needed. Meet with Professor Shiu again to read over literature review and if everything looks good, turn in the paper. Begin designing the poster and preparing necessary information. |
| Mar 11th - Mar 17th | Collect last data up until March 13th and append that onto the collection of market information and run the tool. Design slides for poster and prepare, any pictures, text, and code snippets as needed. Have the poster printed out to show during the meeting with Professor Shiu. Showcase the poster and get feedback. |
| Mar 18th - Mar 24th | Finalize poster, handouts, examples, and speech. Collect small black tripod, necessary poster board, and clips for the poster. Give presentation at the great plains honors conference. Present finding at scholars’ day. |

**Evaluation/Documentation Method:**

20% - Grading Rubric for Application

Development  0 10 20 30 40 50

Is the program thoroughly developed? Can the program successfully collect market data? To what accuracy can the algorithm predict market values? Are the predictions within the margin of error?

Effectiveness            0 10 20 30 40 50

Does the program use justified mathematical produces to generate meaningful results? Are the developers incorporating existing economic practices?

Total:\_\_\_\_\_\_\_/100 possible points

30% - Grading Rubric for Market Prediction and Justification

Backing 5 10 25 20 25

Does the prediction make sense? Is the prediction in line with other market trends to an acceptable point? Is the data collected clean and interpreted correctly?

Mathematics 10 20 30 40 50

Are market calculations performed properly? Is the data gathered used properly when calculations are used? Do liquidity look to be in-line with the current market? Is the volatility measurement justified? Does all the math add up?

Research 5 10 15 20 25

Are sources cited correctly? Does the literature come from reliable sources and is the information conveyed correct? Were proper research methods followed when applying literature logic to the market prediction itself?

Total:\_\_\_\_\_\_\_/100 possible points

30% - Grading Rubric for Literature Review and Other Writing

Literature Review              0 10 20 30 40 50

Does the student give necessary background information to clearly describe the uses of machine learning? Are both pros and cons addressed? Does this research add value to current research?

Abstract     0 5 10 15 20 25

Is the abstract summarized appropriately; is it concise and coherent?  Does the student show why this research is meaningful? Are there substantial results to clearly show completion of work?

Writing Style/Appropriate Length     0 5 10 15 20 25

Are ideas effectively communicated? (transition words, grammar, spelling, appropriate length 5-7 pages )

Total:\_\_\_\_\_\_\_/100 possible points

20% - Poster of Findings

Summary                                                                                           0 5 10 15 20 25

How well does the student communicate large abstract ideas with specific examples? Is the audience able to understand the importance of this research?

Method                                                                                                0 5 10 15 20 25

Did the student thoroughly explain the process in which this research was conducted?

Findings                                                                                             0 5 10 15 20 25

Are the findings laid out appropriately? Can someone who does not understand the topic of machine learning still look at the data and see a trend? How well is the data analyzed and presented by the student?

Poster Style                                                                  0 5 10 15 20 25

How well does the student present the overall information? Is the audience engaged? Did the student speak clearly and avoid using jargon? Is there good eye contact and stance from the presenter?

Total:\_\_\_\_\_\_\_/100 possible points

**Final Grade:**

|  |  |  |
| --- | --- | --- |
| Category | Grade | Percentage of grade |
| Application |  | .2 |
| Market Prediction |  | .3 |
| Writing |  | .3 |
| Poster |  | .2 |
| Total |  |  |

**PLEASE ACQUIRE APPROPRIATE SIGNATURES BELOW.**

**Student:**

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SIGNATURE DATE

**Faculty Supervisor:** By signing this form, you agree to supervise the progress of the above student’s work on a regular basis and to provide a final grade.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SIGNATURE DATE

**Non-campus Supervisor:** By signing this form, you agree to supervise the progress of the above student’s work in collaboration and per agreement as determined by supervising professor.

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Name SIGNATURE DATE

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ORGANIZATION

**Honors College Director:** I have received the above proposal and find it acceptable as an independent study project.

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SIGNATURE DATE