Cryptocurrencies, a new form of digital currency, have seen exponential growth in terms of their value over the past year. For example, Bitcoin, Litecoin, and Ethereum have seen 2,372%, 8,092%, and 8,838% growth respectively over the past year. According to Garrick Hileman, a Bitcoin expert at the Cambridge Center for Alternative Finance, a major factor driving that extraordinary growth is public speculation and sentiment. This insight begs the question, is there a significant difference in the sentiment of speculation surrounding Bitcoin, Litecoin and Ethereum? The answer to this question can direct investors to proactively respond to speculation before that speculation impacts the valuation as described by Hileman.

To answer this question, a sentiment analysis will be conducted on Twitter tweets pertaining to each of the three cryptocurrencies in focus. Twitter is being used as the channel of analysis because it serves as a breeding ground for not only news and updates regarding cryptocurrencies, but also the follow-up conversations held among individual investors. Using the Twitter REST API, three separate searches have been made to collect a substantial number of tweets pertaining to Bitcoin, Litecoin, and Ethereum (over the past seven days of when the search was made on 12/14/17).

The analysis of the tweets includes two primary parts. The first task is to find the polarity score for each tweet. Polarity is a measure of the emotion in a text and is used to evaluate the strength of a positive (good) or negative (bad) sentiment. The polarity score ranges from –1 (negative emotion) to 1 (positive emotion). To collect the polarity of each Tweet's text, the textblob python package will be used. Textblob is a python library for processing textual data and performing related analysis such as sentiment analysis and part of speech tagging. Once the polarity score is recorded for all tweets, we can now test whether or not one of the cryptocurrencies has a significantly better or worse sentiment on Twitter. The histograms in figure 1 below depict the distribution of polarity scores for each currency.
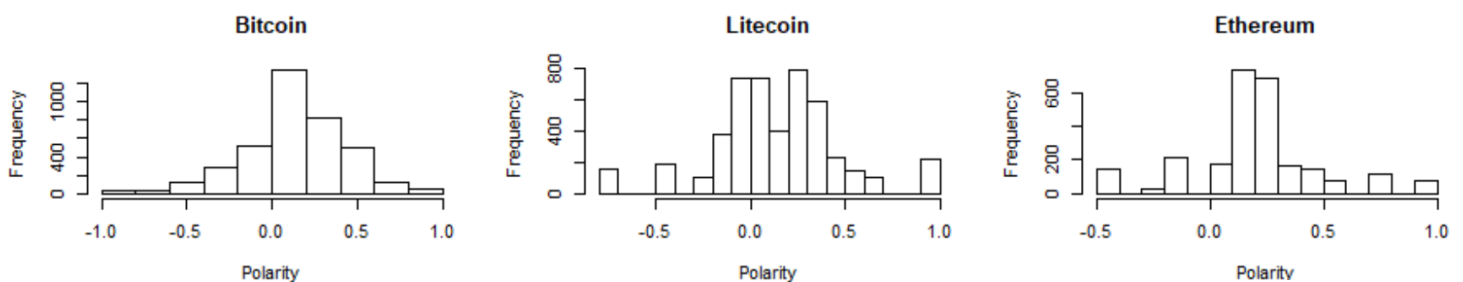

Figure 1: Histograms of the distribution's of polarity scores for BTC, LTC, ETH

Boxplots of the polarity for each cryptocurrency reveal a number of insights (Figure 2). Bitcoin tweets clearly have the largest variation in the amount of positive and negative polarity recorded. We can also see that the median Litecoin polarity score is smaller than Ethereum and Bitcoin. The majority of Ethereum tweets seem to be concentrated in a relatively small polarity range (+0.1-+0.3), but with outliers on both ends of the spectrum. After analyzing the boxplots, the next step is to answer the question: are the differences in polarity significant enough to conclude the public sentiment is truly more positive or negative for these cryptocurrencies?
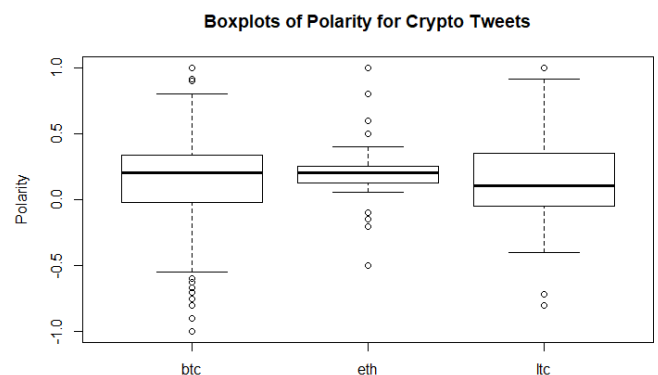

Figure 2: Boxplots of the distribution's of polarity scores

Given what we know after examining the data, to answer this question we will be conducting a Games-Howell multiple mean comparison procedure. This procedure will tell us which cryptocurrencies have significantly different polarity scores as well as what those differences are in terms of polarity scores.

After conducting the test, we find at the 95% confidence level there are significant differences in the polarity scores for Ethereum and Bitcoin, as well as Litecoin and Ethereum. We are 95% confident the polarity score for Ethereum is between .0297 and .0653 larger than that of Bitcoin, which means Ethereum has a more positive sentiment over the last 7 days. We are also 95% confident the polarity score for Litecoin is between .0745 and .0390 points less than Ethereum, which means Litecoin has a more negative sentiment over the last 7 days.

Based on the results, cryptocurrency investors should be wary of Litecoin. Litecoin has a higher propensity to receive negative speculation and investors should be prepared for a devaluation if this speculation continues. We can also see that due to the high variation in Bitcoin sentiment, investors should be prepared for high volatility in their investments and plan accordingly.