Fake Product Identification System

**Motivation and Problem:** Consumers can have a real problem with purchasing fake or knock-off items under the impression that these items are authentic. This is unfortunately common with expensive shoes and the current method of detecting a fake product is unreliable and mainly based on visual comparisons. This leads to many consumers spending a large amount of money on a potentially fake product without a safe way to verify the authenticity of their purchase. My intention is to try and create a way for consumers to be able to securely verify that the product they purchased is authentic.

**Description and Contribution:** I will attempt to create a web application that utilizes the blockchain to store data of the authentic products that consumers can use to verify the authenticity of their purchase. My proposed solution would be to have Shoe companies print out a small QR code somewhere on the shoes. These QR codes could be linked to the blockchain data store and could trace the shoe back to the source and determine authenticity. This would allow users to then just scan the QR code and be taken to the web application that would show all the details for that shoe if it is authentic. This would be a very secure method of verifying authenticity of products because everything on the blockchain ledger is completely transparent. I believe that this would be a significant contribution towards fighting against the fake shoe market and could later be applied to all sorts of products to track source and verify authenticity.

**Proposed Milestones:** I can break this project up into two main milestones with each containing two sub milestones for a total of four milestones. I believe that the best way to begin a project that involves a subject I am not very familiar with is to thoroughly research the existing problem as well as my proposed solution. Milestone 1A will begin by researching the fake shoe market and current attempts to verify authenticity of shoes. Next, I will research the different platforms which would be viable to build this application on and all the existing software/libraries I could use to implement my blockchain storage. Totally, Milestone 1A will be for deciding what packages I will use to implement my proposed project idea as well as becoming familiar with how to use all my chosen packages. Milestone 1B will begin with planning out the architecture of how the app will be structured. This will be the overview/big picture idea of the application including which algorithms I will use and why as well as setting up the environment I will use to create the application.

My proposed deliverable at Milestone 1(1A and 1B combined) would be a document containing an overview of everything I plan to use to develop this application as well as why I have chosen to use the environment and packages I have. I will attempt to have all the structural planning done as well as the environment set up by the Milestone 1 due date. This will allow me to begin my attempts to implement my web application which uses blockchain storage in Milestone 2.

Milestone 2A will be about setting up the blockchain data storage system to store the details of shoes such as manufacturer, date, location, batch number, etc. This portion will be about setting up the back end of my application in order to handle the data that I need handled and storing the data on the blockchain ledger. I will attempt to have the entire back end of the application set up either by the end of milestone 2A or the beginning of milestone 2B. Milestone 2B will begin by finishing the back end of my application if needed before attempting to build the front-end user interface portion of my application. During this stage of my project, I will work to build a very rudimentary version of the user interface which is simply just the user scanning the QR code and the web application verifying if the information supplied inside the QR code correlates to an authentic item. Due to a lack of resources with big shoe companies, I will attempt to create a few fake QR codes which will contain fake information linking to the blockchain storage.

My proposed deliverable for Milestone 2(2A and 2B combined) is to have the entire back end of this application working with the blockchain storage containing a ledger of the authentic shoe database. I will attempt to also have a simple working version of the front-end user interface at milestone 2. Although because this portion of the project is less security relevant than the blockchain aspect, I will prioritize the back-end security portion. If I do not have a working front-end portion, I will work to implement this by the presentation date.

**Proposed Timeline to accomplish the Milestones:**

Milestone 1A will take about two weeks of researching.

Milestone 1B also should take about two weeks to accomplish.

Milestone 1 will totally take roughly four weeks to complete which corresponds to the due date for milestone 1 which is October 10th.

Milestone 2A will take the longest portion of this project and I believe I could accomplish this in three to four weeks. Although this could take longer depending on the problems that I encounter and thus milestone 2B might not be completed until after the milestone 2 due date of November 14th.

Milestone 2B can be completed after the November 14th deadline but prior to the Project presentation during finals week.

This time between the milestone 2 due date and the project presentation due date I will use to perform testing and to fix any major issues I can identify.