Nathan Sampo
Mini-Project 3
Dota 2 Meta Analyzer

Dota 2 is a game developed by Valve Corporation in which two teams of five players, who can each pick from a pool of 113 different heroes, battle each other in an attempt to destroy the other's base. Dota 2 undergoes regular balance patches, designed to better balance the power of all heroes in the game. The state of the game after these patches is called the 'meta', and typically certain heroes are better than others in each meta. In this project, I used Valve's Dota 2 API to gather data from the most recently completed Dota 2 matches. I am interested in this data because I wish to determine which Dota 2 heroes are the best in the current meta.

I decided that a good metric to use to measure each hero's relative success would be that hero's chance of winning a game. I determined this by dividing the number of games won by that hero by the number of games that hero participated in, to get that hero's overall win rate. To do this, I accessed Valve's Dota 2 API to request a list of the IDs of the past several hundred matches, then I requested the match data for each of those matches. In this match data, I could search for the participating heroes and the winning team. After determining if a hero won or lost, I added this data to a list of each hero's total matches won over their total matches played. Dividing these values returned each hero's total win rate, and therefore its ranking in the current meta.

The largest design decision I had to make was determining how to display this data. I chose a large table with the first row being each hero's in-game portrait, and the second row containing the corresponding hero's win rate, sorted with the largest win rate at the farthest right. To get the hero portrait images, I accessed the Dota 2 API yet again. After getting these portraits, I shrank them to make the table more concise. I wanted to use this display method because it is very easy to understand at first glance.

As a Dota 2 player, my experiences with and opinions of the current meta were validated for the most part: the heroes that I believed were strong had incredibly high win rates, and those I deemed weak had low win rates. Beastmaster and Luna, two very strong heroes right now, reign supreme at the top of the win rate charts, while Techies and Lich, one incredibly weak and one mediocre hero, consistently sit at the bottom of the win rate charts. Here is a small sample of hero win rates over the past 100 matches:
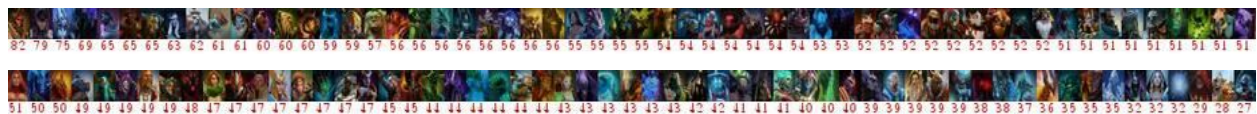
The red number represents a hero's win rate as a percent, and the image is that hero's in-game portrait

Additionally, this data generates other insights. Certain heroes are harder to use effectively than others, and typically lower-skilled players have lower win rates with these more difficult heroes. Since the vast majority of Dota 2 matches are labelled by Valve as being in the 'Normal' skill bracket (compared to 'High' and 'Very High'), most of the matches I parse through to gather this data take place in this Normal skill bracket, with typically lower-skilled players. This means harder to use heroes should have much lower total win rates as compared to easier heroes, and this is exactly what appears to occur. Both Io and Techies, two very difficult to use heroes always rest in the bottom four win rate heroes.

I thought this project was incredibly fun and interesting. I felt like my project was unique, and I thoroughly enjoyed creating it. There are probably many points where I can improve my code and be more efficient, either by removing unnecessary for-loops or calling the Dota 2 API less often, but my code is relatively easy to read and was convenient to implement.

While not the most serious or applicable project possible, I believe that adds to the project by making it more lighthearted and more fun to implement.