Fastest Route to eat Honey Fruit!

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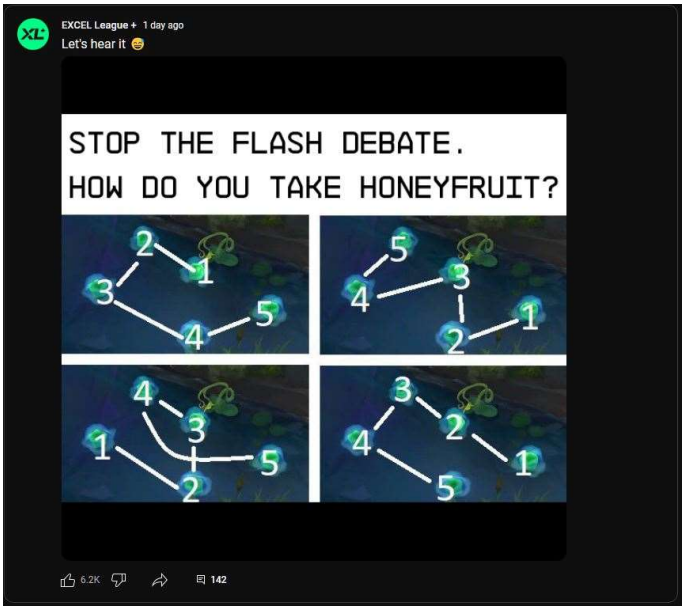


For those who don't know, the numbered goops are called Honey Fruits from the game League of Legends. Whenever your character walks over a Honey Fruit, they regain some Health and Mana. I thought it was a pretty funny joke, but I thought knowing the fastest way could one day come in handy. To do this, I want to apply Look at this like a **Travelling Salesman Problem (TSP)**. I first got L1 pixel measurements of the straight lines between each one of the fruits by using the ruler tool in Photoshop. (300x191px)

AB	80
AC	75
AD	130
BC	120
BD	125
BE	205
CD	75
CE	195
DE	195

*Measured using L1 distance pixel measurement, not in-game units

Assuming that toplaners will be starting at **A** and midlaners will be starting at **E**.

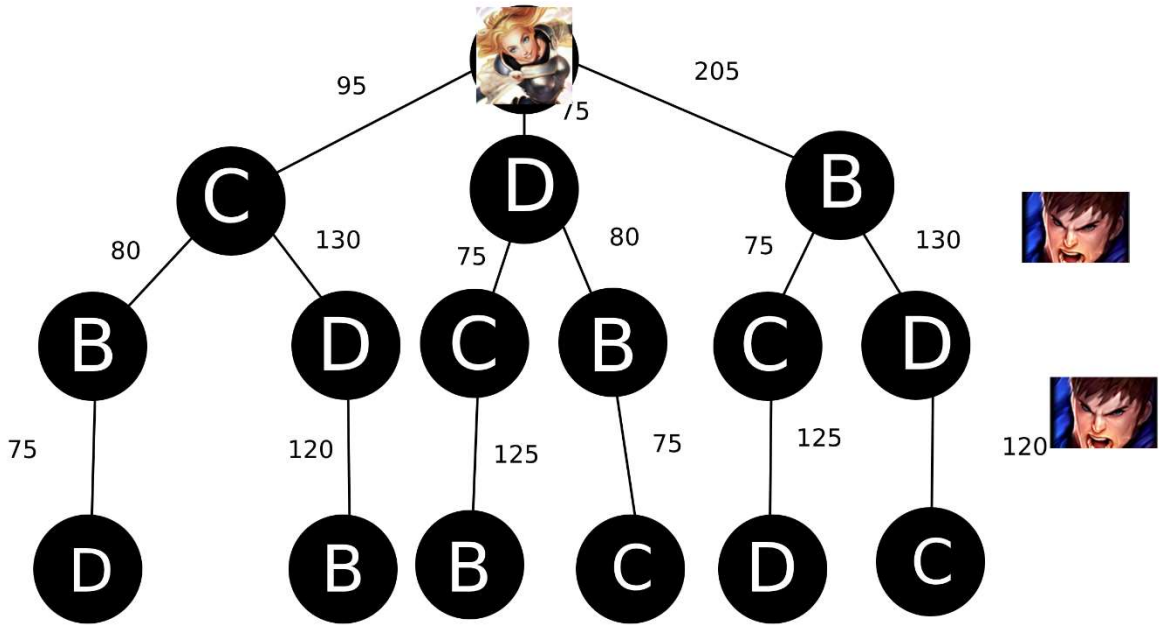
From Midlane **E D C A B = 325**

From Toplane **A B C D E = 290**

Luckily since this is a small TSP, it can be done by hand without too much of a hassle(Though a Java solution is in the GitHub). A 5 fruit plant has 5! = 25 possible routes going either way. If there's a 14 fruited plant in S14 we would need a computer's help to solve this problem. If there's a 20 fruited plant in S20, we are past the point of computers being able to help us.

Fight for Fruit!

In this specific example, Lux wants to eat the fruit for mana, and Garen wants to eat the fruit for health. Lux starts on E, and makes the first move, she can choose any fruit adjacent to herself to start walking towards. Garen starts on A and can then choose any fruit adjacent to himself. Once a fruit has been eaten, it cannot be targeted, but if it is eaten by the other player in transit, you must keep going until you eat all fruits.



Best case for Lux: Lux D-C-B = 170, 4 fruits

Garen D-C-B = 325, 1 fruit

Best case for Garen: Lux C-D-B = 295, 1 fruit

Garen C-D-B = 150, 4 fruits

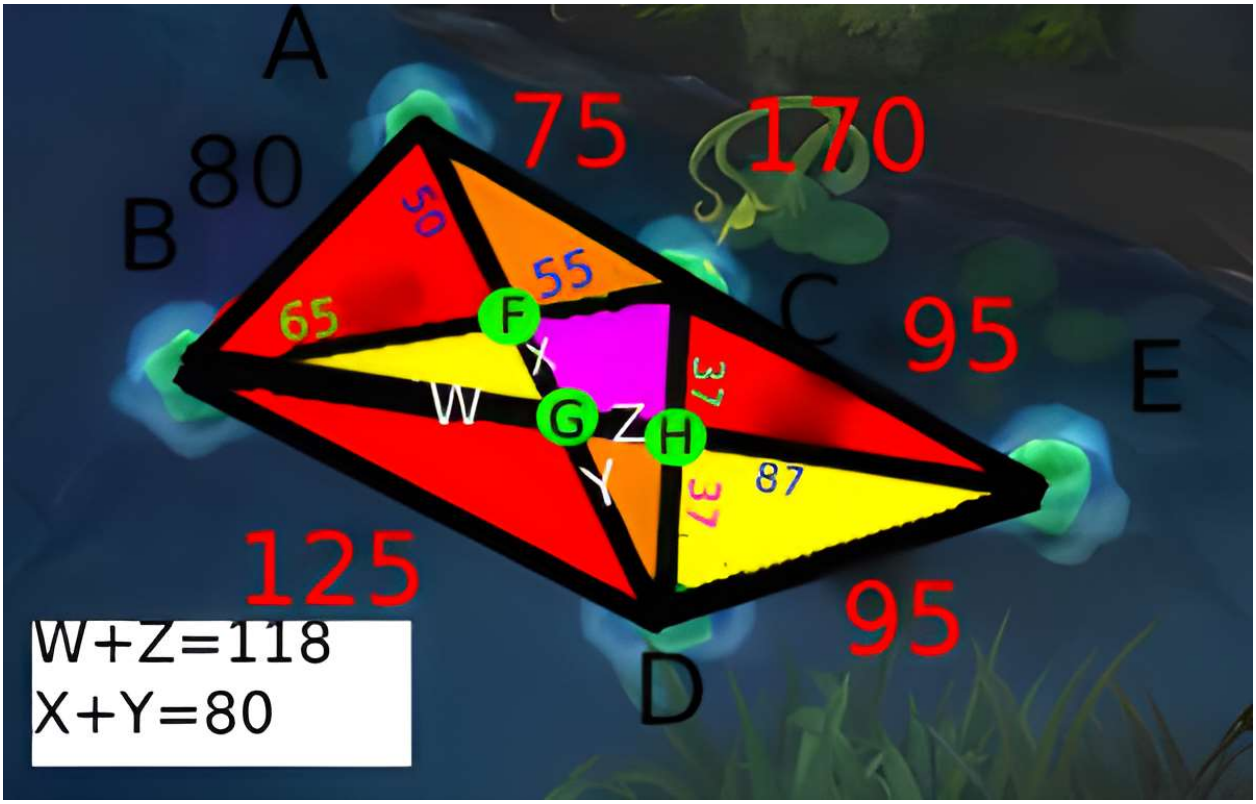
Most competitive match: Lux E-C-B = 220, 2 fruit

Garen A-C-B = 195, 3 fruit

From these results, the Honey Fruits are weighted towards the topside. They are able to get the fruits faster by themselves, and can secure more fruits, given they know how. Top laners that go A-C-B will always secure the 3 fruits before their opponents.

Geometric Analysis

While geometry is one of my weaker sides, I'd still like to consider what I can. The Honey Fruits make a pretty interesting shape. It's a trapezoid where the parallels are at 170px and 125px length, and two other straight sides of 80px and 95px.



After doing as many triangle rules as I could remember I am stumped by WXYZ. I reached out to my 8th grade geometry teacher for some assistance. In the meantime, I made notes of the Intersections F, G, and H. Further on, I'd like to explore these as fruits. At that point, the Fight for Fruit will have to be found by code.