THE 2023 YOUNG MATHEMATICAL STORY AUTHOR (YMSA) COMPETITION

THE CINDY NEUSCHWANDER AWARD

(THE 12-15 YEARS OLD CATEGORY)

SHORTLISTED

'Strategic VI' by Ram Aryan Padala (14 years old)

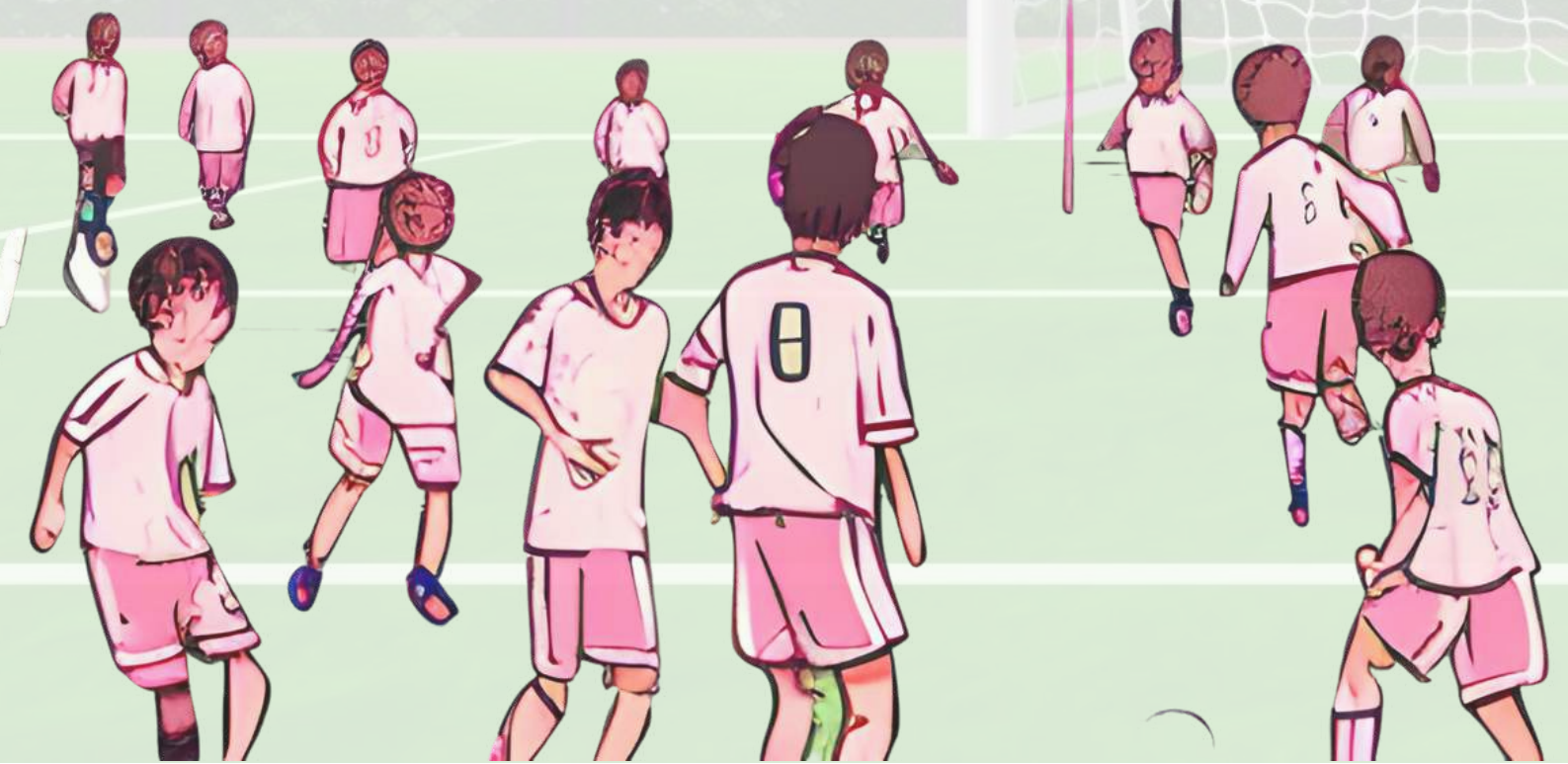
at Silver Oaks International School (India)

You can read the author's inspiration for the story and the judges' comments on:

www.mathsthroughstories.org/ymsa2023

#YMSAMaths

Strategic VI



The Team

-Chapter 1-

After the global pandemic, the whole school was overjoyed after seeing each other, The sports players were the happiest as they got to see their respective courts which was very precious to them. They were the only ones who managed to stay fit during the pandemic time. As they all continued to go to their classes...

Author - Just a second there is an announcement 😄

PA Speaker - "All the sports players, please pay attention, To check your stats and performance there will be a friendly competition held 10 days from now. Further information will be given to you by your respective coaches

Author - Yep, that's the announcement, Let me continue !

This is a story of 6 school friends who are ambitious and crazy about football, making them join the school football team.

The team consisted of 6 players who are Raj, Srija, NV, Rap, Sahan, Jov

RAP

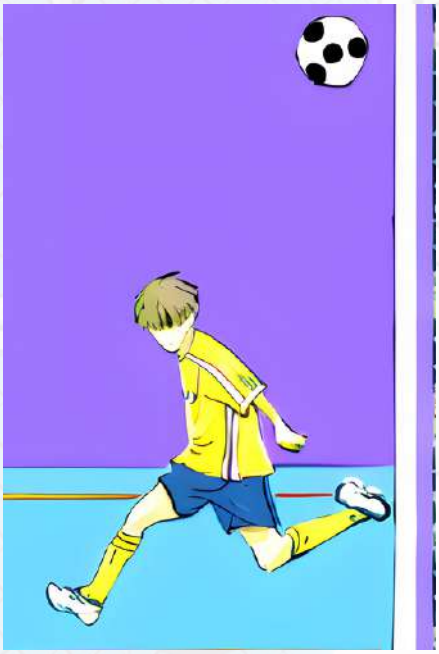
Good at shooting and dribbling

Srija

Good at Passing and Penalties

NV

Good at Defending and long passes



Raj

Good at headers and receiving

Jov

Good at Stamina and dribbling

Sahan

Good at punting and is a goal keeper

All 6 friends visited the football ground during sports period to meet their coach and to confirm the details of the tournament.
As soon as they saw the football ground, all of them were on cloud nine as soon as they touched the lush grass to be amazed by the feeling of it. Then, the coach explained the details to them and suddenly NV jumped in exhilaration and said

NV - Coach! So technically we don't have classes for 10 days, right!

Coach - Yes NV, looks like you don't want to attend classes. I wonder how you attended online classes

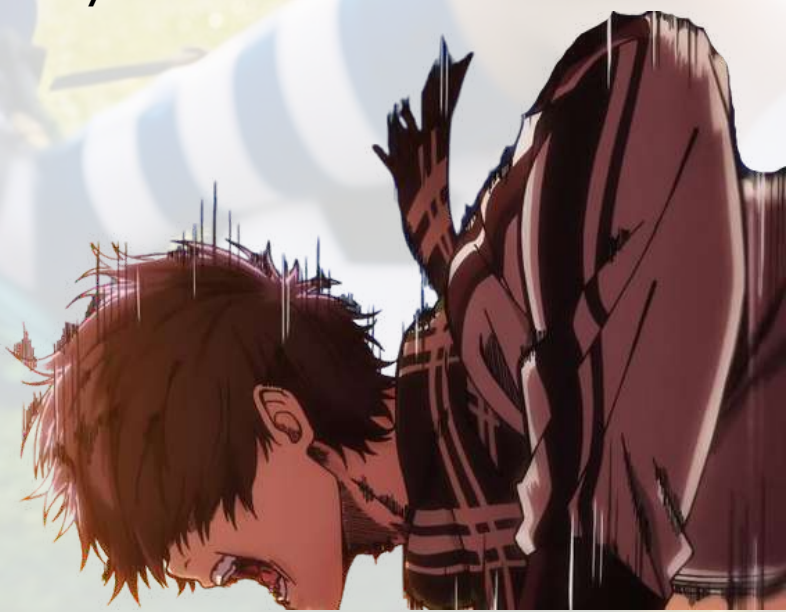
NV - Umm, Let's not talk about that right now

After rigorous training, the team is ready for their first match

Raj - Okay guys, let's win this

The players get ready for their first match, They underestimate the opponent and one of the defender NV plays as the Goal Keeper. And they hear the whistle blow, indicating that the match has begun! The opponent immediately scores one goal after another.

Unfortunately they are unable to counter attack and lose the first match and everyone came back with a melancholy face.



Strategy?!

-Chapter 2-

One day Rap noticed NV bunking math class and approached him after the class and asked him about why he bunked class!

Rap - Hey NV, Why did you bunk math class today ? We learned data handling, It was so interesting
NV - Bro, Math is for nerds
Rap - Who told you that ! It is very useful in our everyday life
NV - Okay, if you say it's useful, can it help us win a single football match !
Rap - Hmm, Coming to think of it, I guess it can
NV - Pfft, Whatever, See you later
Rap - Okay, Bye !

After going home, Rap opens his notes of the recent math class and starts reading through it. He gets an idea and jots it down on a paper.

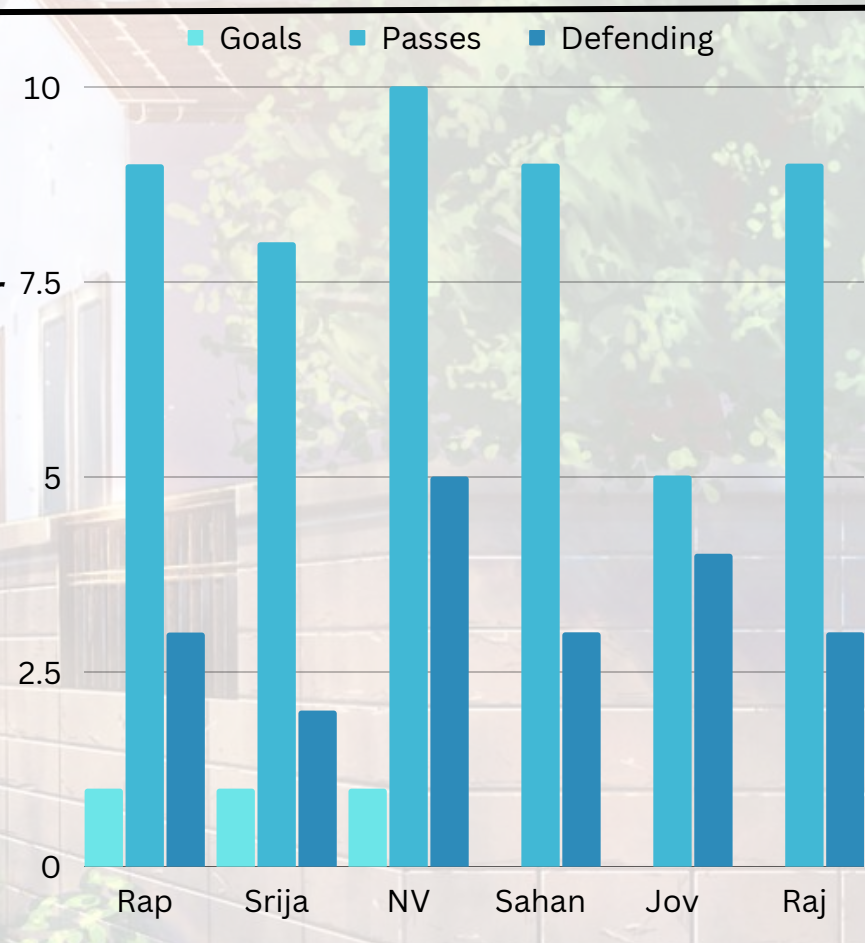
The next day, Rap calls his teammates to his house, where he then explains his plan.

Rap - The other day when I was talking to NV, he asked me how can math help us in our game ! and that got me thinking
NV - No way you called us for a nerdy math session ?
Everyone Collaboratively - Be quiet NV !
NV - Okay, Okay Chill
Rap - Okay let me start again, So the day NV bunked class, was the day we learnt Data handling
Srija - Hmm Yea
Sahan - Ooh, but we learned Probability
Jov - Yea, Same here
Rap - Maybe because you are in another section, but its a helpful topic

So Rap explain his plan on how we can connect, Data handling to Football.

Rap - So here is a layout of our team

Here are the results after the first match, They were in the default formation as shown.



Sahan - Awesome, We all gave our best!

Jov - I think I could have given better performance if I played in Raj's Position

Raj - But you are a defender and I am a midfielder, How can you play my position

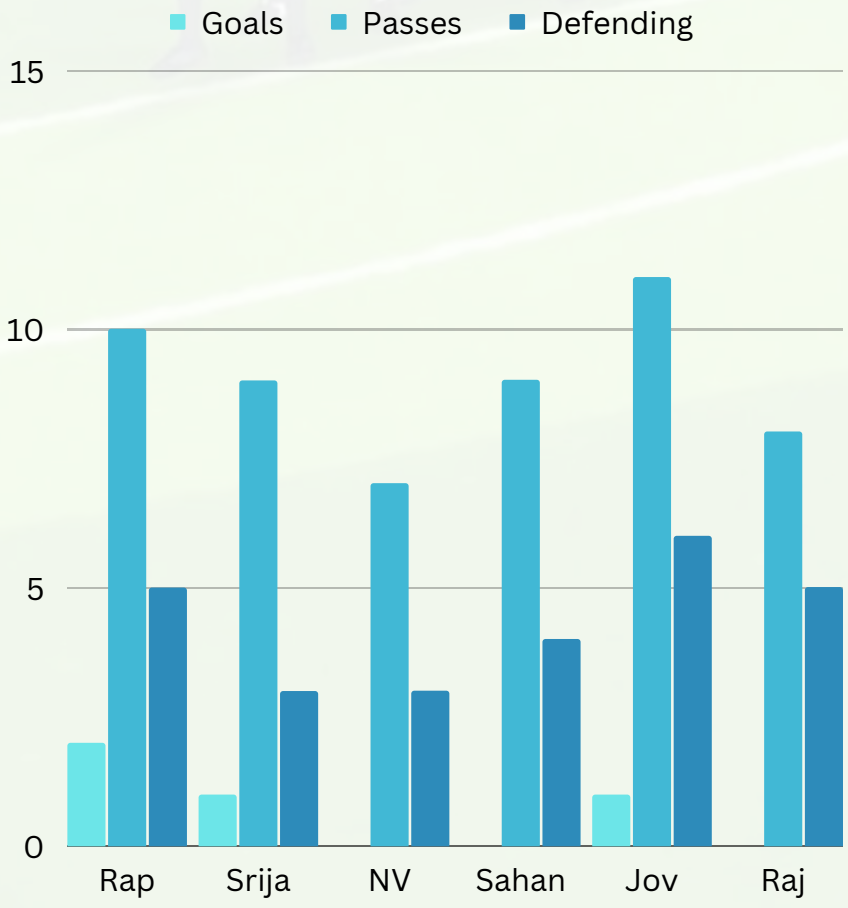
Rap - This test is the whole point of testing our abilities, We should give him a chance

The team gets ready for there next match and the players swap there side. The members on the left side go the the right and left to the right. And Raj and Jov switch there positions.

*NV and Sahan both are goal keepers so they switch positions to check who is better.They get ready to play their second friendly match against there friends.

Here are the results after the second match, They played with there new positions.

As Jov managed to score 1 goal and gave a better performance at being a midfielder. Raj's and Jovs position gets switched



Srija and Rap also switch the side they play in. The final formation is still yet to be made based on performance

NV goes back to being defender and Sahan goes back to be a goal keeper

Okay guys now keeping the Bar Chart aside, we need to calculate the probability, So Jov and Sahan help us out in figuring out the probability

Jov - Sure, We will calculate everyone's probability and explain how we did it

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Sahan and Jov explain how they are going to find the probability.

So Rap and Srija have scored 1 goal out of 3 , The formula to calculate the probability is

Probability of scoring a goal = Number of goals scored / Number of attempts

So, Probability of scoring goal =

1/3 = **0.33 or 33.33%** (Number has been rounded to two decimal points)

So the probability of Rap and Srija scoring in the first match was 33.33%

Now lets compare this value to second match

Rap has scored 2 out of 4 goals and Srija has scored 1 out of 4, Using the same formula if we solve like this

Probability of scoring goal (Rap)= 2/4 = **0.5% or 50%** (Rounding to two decimal places)

Probability of scoring goal (Srija)= 1/4 = 0.25% or 25% (Rounding to two decimal places)

So the probability of Rap scoring in the second match was 50% and Srija was 25%

Hence, Rap playing right wing and Srija left wing is better for the team.

Now for Jov and Raj

As Jov and Raj competed for the position of midfielder, Whoever did better in that position will be selected

First Lets calculate for Jovan *(Number of attempts is 15)

Probability of passing = Number of passes / Number of attempts

So, Probability of giving a good pass =

11/15 = **0.73 or 73%** (Number has been rounded to two decimal points)

So the probability of Jov passing is 73%

Now lets calculate Raj *(Number of attempts is 16)

Probability of passing = Number of passes / Number of attempts

So, Probability of giving a good pass =

9/16 = **0.56 or 56%** (Number has been rounded to two decimal points)

So the probability of Raj passing is 56%

Hence Jov is better at being a midfielder

Now lets calculate for defender

Lets calculate for NV *(Number of attempts is 6)

Probability of defending = Number of times ball has been stopped / Number of attempts

So, Probability of stopping the ball from a opponent =

5/6 = **0.83 or 83%** (Number has been rounded to two decimal points)

So the probability of NV stopping the ball from opponent is 73%

Hence NV is better at his current position of being a defender

Now lets calculate for goal keeper

Lets calculate for Sahan *(Number of attempts is 5)

Probability of goal keeping = Number of times ball has been stopped / Number of attempts

So, Probability of stopping the ball from a opponent =

3/5 = **0.6 or 60%** (Number has been rounded to two decimal points)

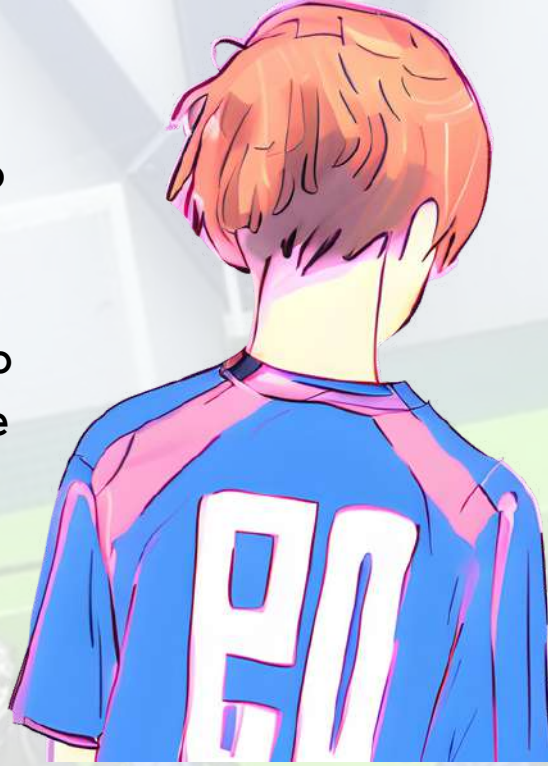
So the probability of Sahan stopping the ball from opponent is 60%

Hence Sahan is better at his current position of being a Goal Keeper

Every one in the team is confident that they will win all the upcoming matches. They keep practicing in the final formation.

This is the final team formation

All the boys go to their first tournament with this strategy and they manage to win, They continue to win tournaments with the strategy. But one day the opposing team are able to exactly mark them and also go through the defense. All the boys did not think much and just accepted defeat. The next day was the final match for them, if they don't win it, Its over for them. Surprisingly the opposing team was able to pinpoint their strategies. At half time, Rap brings out Plan B. The whole team is relieved and thank Rap. After adapting to the new strategy, the opponent was easily defeated and were confused. Rap noticed this and was suspicious, after the game Rap was observing everyone and suddenly notices Raj sneak out of the locker room. Rap follows him and sees him getting scolded and beaten up by the opponents. Rap approaches Raj who is beaten to pulp. Rap helps him get up



And asks him what happened, Raj replies that he is very sorry and talks to Rap showing his back as he cannot face him after doing such a big mistake. Rap asks him, "Dude tell me what happened," Raj explains that he was very angry after Jov replaced him as a midfielder, after this incident he felt as if no one wanted him in the team, That's why for revenge he went to the opponent's team and leaked the strategy, But after you changed the plan the opponents were confused and that's why they beat me up saying that I gave them the wrong plan and that they lost because of me. And Rap comforted Raj and told him that, At least you learned your lesson, But guess what, You are on the winning team! Raj was shocked that Rap forgave him, even after committing such a big mistake. Rap asked him to come join the team celebrating, Raj wondered if they will allow him after this. Rap explained the situation to the whole team and they decided to forgive Raj.

Coach - No time to rest boys, We have another tournament next week ! Call math and ask if he is free! Haha.

THE END

About The Author

Hi, My self Ram Aryan, and I'm a 14-year-old boy who is passionate about cybersecurity, math, and entrepreneurship. I have always been intrigued by technology and the way it affects our lives, which led me to explore the world of cybersecurity. I love solving complex problems and finding ways to protect online systems from cyber threats.

Apart from my interest in cybersecurity, I also excel in math and enjoy solving challenging math problems. I believe that having strong mathematical skills is crucial in the field of cybersecurity, and it helps me to approach problems with a logical and analytical mindset.

Furthermore, I am an aspiring entrepreneur and have a keen interest in creating innovative solutions that can make a positive impact on society. I enjoy coming up with new ideas and developing them into a business plan that can solve real-world problems.

Overall, I am a young, ambitious individual who is determined to pursue my passions and make a difference in the world through technology, math, and entrepreneurship.