Climbing Complexity

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To approach this problem, we first find all possible Final Scores for Jakob Schubert by multiplying 1-8 to boulder climbing and speed climbing score of Schubert. Below is the table for all possible final score.

Lead Climbing	Speed Climbing	Boulder Climbing	Final Score
1	7	5	35
2	7	5	70
3	7	5	105
4	7	5	140
5	7	5	175
6	7	5	210
7	7	5	245
8	7	5	280

Now, we should consider where Schubert would place given each of his potential lead scores.

If Schubert gets 1st in Lead (Score of 1, Total 35): He wins third place, with first Beijing Alberto Lopez with 28 score and second place Nathaniel Coleman with a score of 30.

	Speed Climbing	Bouldering	Lead Climbing	Total Score	Rank
Alberto Lopez	1	7	4 (Original 3)	28	1
Adam Ondra	4	6	2 (Original 1)	48	6
Nathaniel Coleman	6	1	5 (Original 4)	30	2
Tomoa Narasaki	2	3	6 (Original 5)	36	4
Jakob Schubert	7	5	1	35	3
Michaël Mawem	3	2	7 (Original 6)	42	5
Colin Duffy	5	4	3 (Original 2)	60	7
Bassa Mawem	8	8	8 (Original 7)	512	8

If Schubert gets 2nd in Lead (Score of 2, Total 70): Adam Ondra wins gold with a score of 24 and Alberto Lopez in second place with a score of 28 and Jakob Shubert in 7th place.

	Speed Climbing	Bouldering	Lead Climbing	Total Score	Rank
Alberto Lopez	1	7	4 (Original 3)	28	2
Adam Ondra	4	6	1 (Original 1)	24	1
Nathaniel Coleman	6	1	5 (Original 4)	30	3
Tomoa Narasaki	2	3	6 (Original 5)	36	4
Jakob Schubert	7	5	2	70	7
Michaël Mawem	3	2	7 (Original 6)	42	5
Colin Duffy	5	4	3 (Original 2)	60	6
Bassa Mawem	8	8	8 (Original 7)	512	8

If Schubert gets 3rd in Lead (Score of 3, Total 105): Adam Ondra wins 1st place with a score of 24 and Alberto Lopez in 2nd place with a score of 28. Schubert in 7th place.

	Speed Climbing	Bouldering	Lead Climbing	Total Score	Rank
Alberto Lopez	1	7	4 (Original 3)	28	2
Adam Ondra	4	6	1 (Original 1)	24	1
Nathaniel Coleman	6	1	5 (Original 4)	30	3
Tomoa Narasaki	2	3	6 (Original 5)	36	4
Jakob Schubert	7	5	3	105	7
Michaël Mawem	3	2	7 (Original 6)	42	6
Colin Duffy	5	4	2 (Original 2)	40	5
Bassa Mawem	8	8	8 (Original 7)	512	8

If Schubert gets 4th in Lead (Score of 4, Total 140): Alberto Lopez wins 1st place with a score of 21 and Adam Ondra in 2nd place with a score of 24 and Schubert in 7th place.

	Speed Climbing	Bouldering	Lead Climbing	Total Score	Rank
Alberto Lopez	1	7	3 (Original 3)	21	1
Adam Ondra	4	6	1 (Original 1)	24	2
Nathaniel Coleman	6	1	5 (Original 4)	30	3
Tomoa Narasaki	2	3	6 (Original 5)	36	4
Jakob Schubert	7	5	4	140	7
Michaël Mawem	3	2	7 (Original 6)	42	6
Colin Duffy	5	4	2 (Original 2)	40	5
Bassa Mawem	8	8	8 (Original 7)	512	8

From now on no matter what rank Schubert gets from 5th to 8th, he will always be in 7th place in total ranking since Mawem did not complete and therefore doesn't have a score.

To summarise, the only way for Schubert to achieve top 3 is by scoring 1st place in Lead climbing, with Alberto Lopez and Nathaniel Coleman in 1st and 2nd. Otherwise, the top 3 would always be Alberto Lopez, Adam Ondra and Nathaniel Coleman, in the order of 213 if Schubert achieves 2nd or 3rd in Lead climbing and 123 if Schubert achieves 4th to 8th in Lead climbing.

Surprises:

The biggest surprise is how much the multiplicative scoring system amplifies even a single poor result. Schubert needs to get first to have a chance at getting a medal, and it majorly punishes a competitor's score even for a single error.

Benefit of Multiplication Method:

1. Rewards All-Around Performance

- To get a low product, an athlete needs to be strong in all three disciplines.
- One weak event can’t be easily masked encouraging well rounded climbers.

Example:
2nd × 2nd × 2nd = 8
But 1st × 1st × 8th = 8
Even with an 8th place, the two wins barely balance it, showing how tight the scoring is.

2. Greater Separation Between Scores

- Multiplying ranks produces more distinct totals, especially when events are very different.
- This lowers the chances of ties and makes the final ranking more obvious.

Drawbacks of Multiplication Method:

1. Harsh on One Weak Event

- One bad performance can ruin your chances — even if you get 1st in the other two events.

Example:
1st × 1st × 8th = 8
2nd × 2nd × 2nd = 8
So a single 8th place can completely cancel out two wins!

2. Less Forgiving, More Punishing

- Athletes have no margin for error. This can feel unfair — especially if the poor result came from something minor like a slip.

To fix this I believe a better Alternative Scoring Method is the Sum of Rank

Total Score = Speed Climbing Rank + Bouldering Rank + Lead Climbing rank

Example of Addition Method In use:

	Speed Climbing	Bouldering	Lead Climbing	Total Score	Rank
Alberto Lopez	1	7	4 (Original 3)	12	2
Adam Ondra	4	6	2 (Original 1)	12	2
Nathaniel Coleman	6	1	5 (Original 4)	12	2
Tomoa Narasaki	2	3	6 (Original 5)	11	1
Jakob Schubert	7	5	1	13	3
Michaël Mawem	3	2	7 (Original 6)	12	2
Colin Duffy	5	4	3 (Original 2)	12	2
Bassa Mawem	8	8	8 (Original 7)	24	3

Here's what the final standings would look like for if Schubert achieves 1st place in Lead Climbing with the addition method. As you can see, the scores are much closer and less punishing for a bad result. Even though there are many benefits of the addition method, there are also drawbacks of the method.

Benefit of New Addition Method:

1. Reduces the Impact of One Bad Result

Multiplication punishes a single bad rank (example: a score of 7 or 8 multiplies everything). While using addition, a single poor event doesn't completely destroy your medal chances.

For example, under multiplication:

- A rank of $1 \times 2 \times 8 = 16$
- A rank of $2 \times 2 \times 8 = 32$
- Huge difference for a small change!

In comparison, under addition:

- $1 + 2 + 8 = 11$
- $2 + 2 + 8 = 12$
- Much Smaller penalty.

2. Fairer to Athletes specialising in a single area

- An athlete who is very good at one area but average in others can still place well.
- With multiplication, you have to be excellent in all three areas
- Addition gives athletes room to still win medals without being totally penalized for a 5th or 6th place.

Drawbacks of New Addition Method:

1. Doesn't Reward Dominance Strongly Enough

- An athlete who dominates one or two area but places low in the third might not get rewarded fairly.
- Example:
    - 1st, 1st, and 8th = 10 points
    - 3rd, 3rd, and 3rd = 9 points
      Despite two 1st-place finishes, the first athlete ranks lower.

2. More Ties

- Addition makes fewer unique scores (examples: many ways to total 12), especially in small competitions.
- This increases the need for tiebreakers, which adds complexity to results and might feel unfair to some athletes, also confusing the audience.

Because the additive method frequently results in tied scores, additional tiebreaker rules are required.

Possible Tiebreaker Methods:

1st Method: Most first place/ Highest ranking

Count how many 1stss place an athlete has. If only one person in the tie has a 1st place, then he achieves 2nd place in total ranking, and the other athletes will fight for 3rd place by looking at their highest rank in the 3 events and comparing them to determine. If two people in tie has 1st place, then the ranking would be determined by multiplying their other 2 scores and seeing which one is lower. If it's still a tie, then it's best to compete the two athletes individually in the 3 events and whoever wins the most would place 2nd place with the other being 3rd place.

2nd Method: Multiplicative method

Resort to the use of multiplicative method in tiebreaker, looking for the least scores multiplicatively. Making tiebreaker easy and quick.

So Why Didn’t the Olympics use the addition method?

Because multiplication rewards truly well-rounded climbers. Someone who gets 1st, 2nd, and 2nd will beat someone who gets 1st, 1st, and 6th. That forces athletes to be strong in every area, not just specialising in one.

But if the goal is to make the scoring more forgiving to bad result, easier to follow, and better for athletes specialising in one area, then addition could be a more balanced and audience friendly alternative.

Speed Climbing is very different to the other two types of climbing, so athletes who are the best in the world at speed climbing might not necessarily do very well at bouldering or lead climbing. But the organizers want to make sure that the nest speed climbers in the world would still have a good chance of getting a medal. How might this have affected their choice of scoring method?

This is a very insightful question, going into the core reason why Olympics chose the multiplicative method, and I believe there are a few reasons.

1. Speed climbing is a very different event compared to bouldering and lead climbing:

- Speed is explosive, fast, and standardized (same wall every time).
- Bouldering is short, powerful problem-solving with different routes.
- Lead is endurance based and technical, with long, unpredictable climbs.

Because of this, athletes who are world classed in speed climbing often don’t do well in bouldering or lead climbing. So, the organizers had a tough challenge.

2. Why Multiplication Helps Speed Climbers

If the organizers had used the addition method, speed climbers who placed near the bottom in bouldering and lead would end up with very high total ranks making it almost impossible to medal.

But with multiplication, if a speed climber gets:

- 1st in speed, and
- moderate ranks (say 5th or 6th) in the others,

they can still get a competitive product.

Example:
1st (Speed), 6th (Boulder), 5th (Lead) → 1×6×5=30. That might still be a medal-winning score!

So, the multiplication method gives speed specialists an encouragement

- They can't just rely on speed alone,
- But they can still be in top three if they're average in the other two.

In Summary

Because speed climbing is so different from the other two events, the organizers used a multiplicative scoring method to make sure that:

- All area mattered, and
- Speed climbers weren't unfairly penalized just for being weaker in bouldering or lead.

This method gives an easier path to medals for specialists, while still encouraging all athletes to be well rounded.

Final Words

Although the addition method is a bit easier on someone who might have one area that's average and is simpler to understand, it leads to many ties and doesn't reward a good performance as much. However, the multiplication method really punishes any error and forces athletes to be excellent in every area. This smart method works well for climbing, where speed, bouldering, and lead climbing each requires very different skills.