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# ASSIGNMENT-2

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Assignment Report



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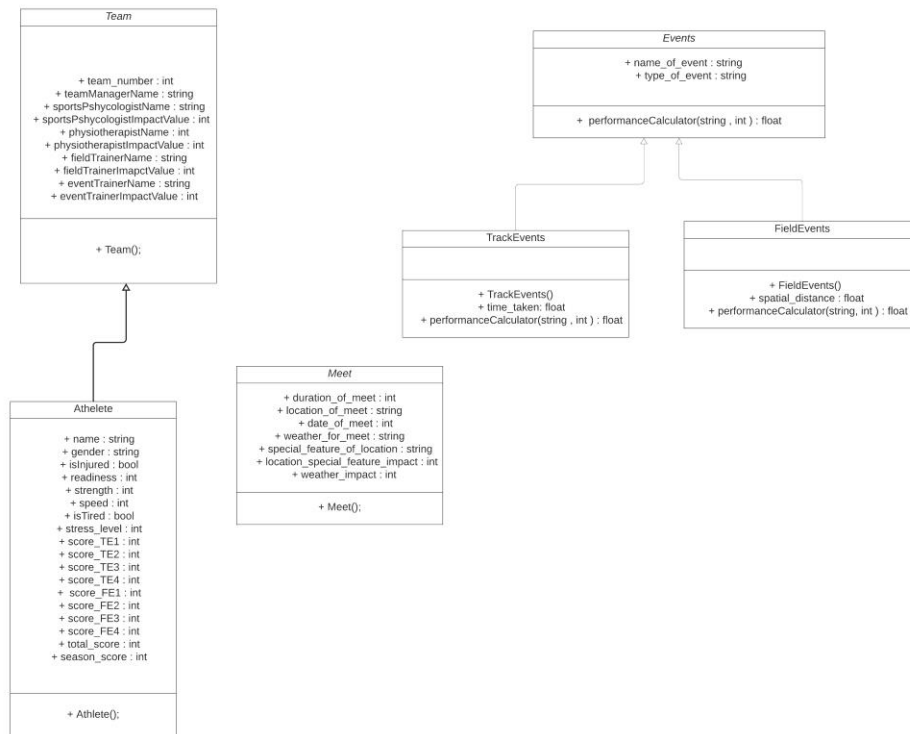


Figure 1

Describe the events that you will be adding to your Octathlon. Explain the scoring of them.

There are two types of events in octathlon namely Track event and field events. Track events are measured with respect to time taken for the event. Field event is measured in terms of spatial distance covered in the event.

The track events included in the meet are 100m running race, 1500m running race, 110m hurdle race(T1) and 500m(T2) race.

100m Race – To determine the scores for 100m race, the below steps have been followed

- To determine the time taken by athlete for completing the race, the  $S = D/T$  formula has been used. In which the distance is fixed as 100 and by providing the randomly generated speed of athlete, the time taken for the race will be calculated. This is done in Track Event class's Performance calculator function.
- To determine the points scored for the event, the formula for track event  $INT(A(B - P)^C)$  is used. And P is changed with the time taken by athlete for completing the race. The athletes with faster time will get more points.
- The values for a, b and c for 100m race are 25.4347, 18 and 1.81 respectively. The calculation for the formula is done in the function called trackEventFormula. The function is returning the total points given to athlete for the event.
- The total points gathered in the 100m event are then stored in the Athlete class's score\_TE1 attribute.

1500m running race - To determine the scores for 1500m race, the below steps have been followed

- To determine the time taken by athlete for completing the race, the  $S = D/T$  formula has been used. In which the distance is fixed as 1500 and by providing the randomly generated speed of athlete, the time taken for the race will be calculated. This is done in Track Event class's Performance calculator function.
- To determine the points scored for the event, the formula for track event  $\text{INT}(A(B - P)^C)$  is used. And P is changed with the time taken by athlete for completing the race. The athletes with faster time will get more points.
- The values for a, b and c for 100m race are 0.03768, 480 and 1.85 respectively. The calculation for the formula is done in the function called trackEventFormula. The function is returning the total points given to athlete for the event.
- The total points gathered in the 1500m event are then stored in the Athlete class's score\_TE4 attribute.

110m hurdle race (T1)- To determine the scores for 110m race, the below steps have been followed

- To determine the time taken by athlete for completing the race, the  $S = D/T$  formula has been used. In which the distance is fixed as 110 and by providing the randomly generated speed of athlete, the time taken for the race will be calculated. This is done in Track Event class's Performance calculator function.
- To determine the points scored for the event, the formula for track event  $\text{INT}(A(B - P)^C)$  is used. And P is changed with the time taken by athlete for completing the race. The athletes with faster time will get more points.
- The values for a, b and c for 110m race are 5.74352, 28.5 and 1.92 respectively. The calculation for the formula is done in the function called trackEventFormula. The function is returning the total points given to athlete for the event.
- The total points gathered in the 110m event are then stored in the Athlete class's score\_TE2 attribute.

500m race (T2)- To determine the scores for 500m race, the below steps have been followed

- To determine the time taken by athlete for completing the race, the  $S = D/T$  formula has been used. In which the distance is fixed as 500 and by providing the randomly generated speed of athlete, the time taken for the race will be calculated. This is done in Track Event class's Performance calculator function.
- To determine the points scored for the event, the formula for track event  $\text{INT}(A(B - P)^C)$  is used. And P is changed with the time taken by athlete for completing the race. The athletes with faster time will get more points.
- The values for a, b and c for 500m race are 1.53775, 82 and 1.81 respectively. The calculation for the formula is done in the function called trackEventFormula. The function is returning the total points given to athlete for the event.
- The total points gathered in the 500m event are then stored in the Athlete class's score\_TE3 attribute.

The field events included in the meet are Discus Throw, High Jump, Shot Put (F1) and Javelin Throw(F2) race.

Discus Throw - To determine the scores for Discus Throw, the below steps have been followed

- The spatial distance covered by athlete in the event is calculated with respect to the strength of the athlete in the performance Calculator function in Field Event's class.
- The calculated strength is then passed to the formula  $\text{INT}(A(P - B)^c)$  for calculating points for the event. Here P is replaced with the spatial distance value. The values for a,b and c are 12.91, 4.0 and 1.1 respectively.
- The calculated points are then set into Athlete class's score\_FE1 attribute.

Shot Put - To determine the scores for Shot Put, the below steps have been followed

- The spatial distance covered by athlete in the event is calculated with respect to the strength of the athlete in the performance Calculator function in Field Event's class.
- The calculated strength is then passed to the formula  $\text{INT}(A(P - B)^c)$  for calculating points for the event. Here P is replaced with the spatial distance value. The values for a,b and c are 51.39, 1.5 and 1.05 respectively.
- The calculated points are then set into Athlete class's score\_FE2 attribute.

Javelin Throw - To determine the scores for Javelin Throw, the below steps have been followed

- The spatial distance covered by athlete in the event is calculated with respect to the strength of the athlete in the performance Calculator function in Field Event's class.
- The calculated strength is then passed to the formula  $\text{INT}(A(P - B)^c)$  for calculating points for the event. Here P is replaced with the spatial distance value. The values for a,b and c are 10.14, 7 and 1.08 respectively.
- The calculated points are then set into Athlete class's score\_FE3 attribute.

High Jump - To determine the scores for High Jump, the below steps have been followed

- The spatial distance covered by athlete in the event is calculated with respect to the strength of the athlete in the performance Calculator function in Field Event's class.
- The calculated strength is then passed to the formula  $\text{INT}(A(P - B)^c)$  for calculating points for the event. Here P is replaced with the spatial distance value. The values for a,b and c are 0.8465, 75 and 1.42 respectively.
- The calculated points are then set into Athlete class's score\_FE4 attribute.

Describe qualitatively, so not numerically, the characteristics you use for the athletes.

The characteristics for athletes are as below

1. Name – the property stores the name of the athlete.
2. Gender – the property stores gender of athlete(Male/Female)
3. isInjured- the property stores the value true if the athlete is injured otherwise false.
4. Readiness – the property represents the readiness of the athlete. The readiness is a combination of athlete's strength, speed, isInjured and isTired property. Higher the readiness better the performance in the events of athlete.
5. Strength – the property stores the randomly generated value of strength of athlete.
6. Speed – the property stores the randomly generated value of speed of athlete.
7. isTired – the property is an indicator of whether the athlete is tired or not. The value of the property will be true if athlete is tired. In case of tired property being true, the performance of athlete will degrade in events.
8. Stress\_level – the stress\_level property represents the stress or pressure faced by athlete. It's a randomly generated property and will increase in case of multiple failures or injury.
9. Total\_score – the property represents the total score for a meet. The value of property will be addition of all event scores.
10. Season\_score – the property represents score of all meets held. The value of property is additional of all the events played in all the meets.

Describe the special features possible for locations, and how they impact on performance.

The location should be distinct for a meet. And for each location there will be a special feature that will have an impact on athlete's performance. The special feature considered are Plain Track, Low Steep Track, Moderate Steep Track and High Steep Track as below

1. Plain Track – the plain track special feature causes negligible effect on athlete's performance. If the event is being played on plain track there will be 1% reduction in athlete's speed and strength.
2. Low Steep Track – If the event is being played on Low Steep Track the impact on athlete's performance will be low. The reduction in athlete's speed and strength will be of 2%.
3. Moderate Steep Track - the moderate steep track causes moderate effect on athlete's performance. If the event is being played on moderate steep track there will be 3% reduction in athlete's speed and strength.
4. High Steep Track - the high steep track causes adverse effect on athlete's performance. If the event is being played on high steep track there will be 4% reduction in athlete's speed and strength.

Describe the characteristics of the support staff for each team and qualitatively how those impact on the team activities.

The support staff consist of sports psychologist, physiotherapist, field trainer and event trainer. At the end of a meet the athletes are provided with the assistance of support staff for improvement in performance. The impact and characteristics of the support staff are as below

1. Sports Psychologist – the Sports Psychologist will help the athletes in managing the stress levels. Also during the injury the sports psychologist will have positive impact on athlete. The impact value of Psychologist is randomly generated value.
2. Physiotherapist – Physiotherapists will help the athletes to recover from the injuries. Also to increase the readiness of the athlete, the impact value of Psychologist is randomly generated value.
3. Field Trainer – the field trainer will help athletes in improving performance in field events. The impact value of trainer is randomly generated value.
4. Event Trainer – the event trainer will help athletes in improving performance in track events. The impact value of event trainer is randomly generated value.
5. Team Manager – the team manager has no impact, it's just a name.

Describe the process you use to determine performance in each event. In particular, this should reference the characteristics mentioned in the previous point, and should take into account the functionality implied by the roles of the support staff.

Track Event – To determine the scores for track event, the below steps have been followed

- To determine the time taken by athlete for completing the race, the  $S = D/T$  formula has been used. In which the distance is fixed and by providing the randomly generated speed of athlete, the time taken for the race will be calculated. This is done in Track Event class's Performance calculator function.
- To determine the points scored for the event, the formula for track event  $INT(A(B - P)^C)$  is used. And P is changed with the time taken by athlete for completing the race. The athletes with faster time will get more points.
- The values for a, b and c will vary for the events. The calculation for the formula is done in the function called trackEventFormula. The function is returning the total points given to athlete for the event.
- After every event due to the impact of event the athlete is getting tired therefore the value of speed and readiness will decrease randomly. This is shown in the function calculatingImpactForTrackEvent.
- If the athlete gets injured during the event the athletes' speed and readiness will decrease. This will impact performance of athlete in all the events.
- To improve the performance of athletes in track events the sports phycologist, physiotherapist and event trainer will provide positive impact on athlete's attributes.

To calculate the performance in track events the time is calculated as discussed above. The time taken to complete the track event is directly proportional to the speed of the athlete. The speed of the athlete is impacted by various factors like weather, location special feature, injury and tiredness. To improve the performance in the track events, the athletes are assisted by sports phycologist, physiotherapist and event trainer. All these support staff members will

help in improving the athlete's speed which will hence improve the performance in track event.

Field Event - To determine the scores for field event, the below steps have been followed

- The spatial distance covered by athlete in the event is calculated with respect to the strength of the athlete in the performance Calculator function in Field Event's class.
- The calculated strength is then passed to the formula  $\text{INT}(A(P - B)^c)$  for calculating points for the event. Here P is replaced with the spatial distance value. The values for a,b and c are provided respectively.
- The calculated points are then set into Athlete class's score attribute.
- After every event due to the impact of event the athlete is getting tired therefore the value of strength and readiness will decrease randomly. This is shown in the function calculatingPointsForFieldEvent.
- If the athlete gets injured during the event the athletes' strength and readiness will decrease. This will impact performance of athlete in all the events.
- To improve the performance of athletes in field events the sports phycologist, physiotherapist and event trainer will provide positive impact on athlete's attributes.

Describe your weather system, and how that impacts on your events

The weather will have impact on the athlete's performance. In adverse weather the athlete's attributes like speed and strength will reduce significantly. The weather conditions considered are Sunny, Cold and Rainy. The weather for the day of meet will be generated randomly from these. The effects of the weather are as below

- If the weather is sunny, it will have low impact on athlete's performance. The athlete attributes will be reduced by 1%. The impact for weather is calculated in function calculatingAthletePerformanceForImpact.
- If the weather is cold, it will have moderate impact on athlete's performance. The athlete attributes will be reduced by 2%. The impact for weather is calculated in function calculatingAthletePerformanceForImpact.
- If the weather is rainy, it will have high impact on athlete's performance. The athlete attributes will be reduced by 5%. The impact for weather is calculated in function calculatingAthletePerformanceForImpact.