

Block tournaments

A new scheme for open competitions

by Hans Block

We present an entirely new scheme of tournaments for sports with pair wise meetings. The method gives the whole ranking order. It is fast, fair, and thrilling. Nobody is eliminated directly. Applications are chiefly school tournaments, propaganda competitions, and international open championships. The inventor, Hans Block, is a mathematician and has worked as IT security manager at Statistics Sweden, Stockholm, Sweden.

Traditional tournament schemes, such as the cup, series, and ladder, all have their drawbacks. In a cup, the second best player can be eliminated far too early. The series take very long time. The ladder is too difficult to predict. We offer a completely new tournament form for all sports where player or teams **compete in pairs**. Such sports are e. g. football, ice-hockey, tennis, badminton, table tennis, billiards, boxing, wrestling, fencing, chess, and bridge. The scheme has many advantages:

Advantages

You get the **whole ranking order**, not only the places of the very best players.

The competition will be **thrilling**. Every match is important. You will meet opponents more and more equal in strength. You have to do your very best all the time. The public can seldom guess of the result in advance. The matches are assigned according to the latest results.

Nobody is eliminated directly. Almost all players may play almost all rounds. When the number of participants is even, there are very few exceptions from this rule in the beginning of the tournament.

The scheme is as **fair** as can be expected: If everybody plays according to his strength all the time, the final ranking will be correct, independent of the assignments. The second best player will win silver, even if he

has lost against the very best one in the first round.

The tournament uses **few rounds**. No unnecessary matches are played. After twice the rounds of a cup with the same number of participants, almost everything is settled. It is theoretically impossible to design much faster tournaments.

The scheme is **new**. The participants will be pioneers. The method relies on research in computer science. Without modern technology it would be impossible. The organizers have something extra to offer the participants and the public.

Very **large tournaments** will be possible. No complicated classes and rules of promotion are needed, since the scheme itself arranges equally strong opponents to each competitor. Since all players compete in one single block, we call such a competition a *Block tournament*.

The principles

The scheme relies on two simple principles:

- If A has won over B in the tournament, then A is better than B .
- If A is better than B , and B is better than C , then A is better than C .

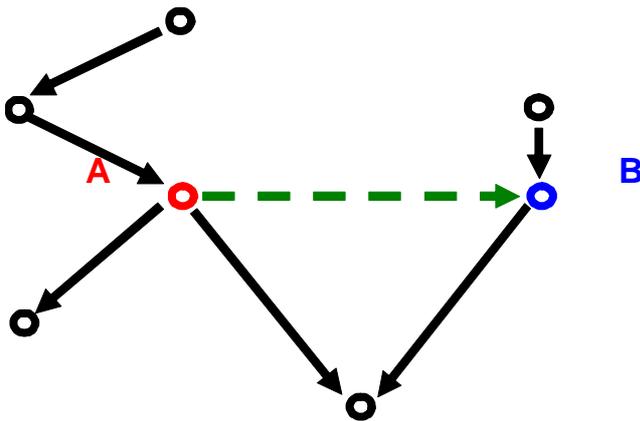
Since a match can end in any way, the scheme must guarantee that if A is better than C , A must never meet C , and that uncertainties or loops should never arise. A victory over a

strong opponent will therefore be much more valuable than a victory over a beginner.

These assumptions are not always true, but they are still reasonable and widely used, for example in the cup.

How the scheme works

If there is a chain of matches between A and E , so that A has won over B , B has won over C , ... and D has won over E , then we say that A is (directly or indirectly) **better** than E . We



define **worse** correspondingly. We also count the points in a very special way:

points (A) = number of players **worse** than A – number of players **better** than A .

Thus, the best player will get the highest score.

Points = Worse - Better

	Before		After	
	A	B	A	B
Worse	2	1	3	1
Better	2	1	2	4
Points	0	0	1	-3

An example of counting points. The arrows go from a winner to a loser. Before the round, A and B have equal points and play. We assume that A wins. After the match, A , can profit on B 's victories, and B is handicapped by the losses of A .

The players are placed in a preliminary ranking list which will be more and more correct as the tournament progresses. Before the first round, the **players are mixed** at random. In every round the following happens:

- **Matches** are assigned **between adjacent players** in the preliminary ranking list, if these players have not met previously. In that case, some player must wait.
- The **matches are played**.
- The **points** of all players **are computed** as above.
- The **players are sorted** by the points. Players with equal points are mixed at random. This gives the ranking list of the next round.

The competition goes on until **all adjacent players have competed**. Then the order is correct.

The tournament is managed by a computer. After each round, the computer prints lists, so that everybody knows his history, points, and rank, and also details of the next match, including opponent, time and place.

Some rules

The organizer may **rearrange** the matches between **players with equal points**, in order to consider seeding, prevent that friends meet in the first rounds, or avoid somebody standing over.

Advantage (home ground, first serve, white men in chess and the like) is given to the player with the least number of advantages during the tournament. When the numbers are equal, the advantage is given to the player with the worse rank.

Draws (if they may occur) are counted as not played. However, the results are registered, and the computer tries to avoid matches between players who have met before.

If the result of a match is not **ready within the prescribed time**, it is still possible to avoid loops, independent of the result.

The competition can be **suspended** after a previously agreed number of rounds, even if the order is not completely settled. The ranking order after the last round will be considered as the final result of the competition.

If agreed upon in advance, the winner can be appointed after a **final** in the last round between the first and second best, or after a cup with the four best players.

It is unsportsmanlike to break a Block tournament! If a player loses due to walk-over, it affects all competitors who have lost against him before. If somebody must break off, he must report it to the leaders of the competition, so that he can be removed in a fair way.

Applications

The scheme is very **rapid**. Think of the following: 16 000 football teams in Sweden compete in a system of series in several divisions. If all these teams were to meet in one Block tournament, only 34 rounds would be required! This is only little more than the number of rounds in the leading division.

School tournaments, however, can be arranged according to our method. All children can join the tournament, compete a lot, and have fun. They meet more competitors than they would normally do, as they do not necessarily have to meet opponents of the same age.

Propaganda competitions with many participants could be arranged in this way. For example, you could invite 1000 table tennis players to Stockholm over a weekend. Nobody knows very much about the ranking order in advance, but after a Block tournament of 16 rounds everybody has got his place, if not exactly so with some minor error.

In **international open championships** the organizers can offer something very special, the participants get definite grades of their performance, the public get unusual matches to enjoy, the papers new questions to speculate over, and the national sport organization gets a specific merit.

Experiences

You can safely arrange a Block Tournament. The scheme is theoretically well evaluated. It has been presented and has aroused a vivid interest, from the Minister of Sports down to individual clubs. About ten different tournaments – in badminton, table-tennis, squash, volleyball, basketball, karate, and chess– have been arranged. There has been a clear interest from bowling, fencing, and tennis. The Swedish Table Tennis confederation and the Swedish Badminton Confederation have bought the program.

Technically, the tournaments have worked well. The program has worked as planned. The lists came in time. The competitions were accomplished without delay. A few bugs in the software have been detected and corrected. Experiences have been won and been included in the documentation.

The reactions have been positive. The participants were satisfied and asked for the next opportunity to take part in a Block tournament. Some results have been astonishing, but everybody had fun.

Special software for Block tournaments has been developed. We are glad to demonstrate the program and help those who want to arrange new tournaments. Information and software will be delivered from:

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