PROCEDURES FOR STRUCTURING AND SCHEDULING SPORTS TOURNAMENTS

Third Edition

PROCEDURES FOR STRUCTURING AND SCHEDULING SPORTS TOURNAMENTS

Elimination, Consolation, Placement and Round-Robin Design

By

FRANCIS M. ROKOSZ

Wichita State University
Wichita, Kansas

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PREFACE

A tournament is a formal and orderly system for impartially determining the winner of a competitive situation. The intent of this book is to give the reader a technical background in the structural design of sports tournaments, the mathematics attendant to their individual constructions, and the processes involved with scheduling. Numerous tournament designs are presented within the general categories of elimination, placement, and round-robin formats.

Tournament structures and scheduling methods are just part of the larger picture of organizing a successful event. Other significant issues involve things like participant eligibility regulations, rules of the sport, personnel-facility-equipment concerns, risk management, finances, concessions, crowd control, and so forth. For a detailed examination of those topics, as well as aspects of conducting specific sports events, see: Rokosz, F.M. and Taylor, H. (1994). *Administrative Procedures for Conducting Recreational Sports Tournaments: From Archery to Wrestling.* Springfield, Illinois: Charles C Thomas, Publisher.

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PROCEDURES FOR STRUCTURING AND SCHEDULING SPORTS TOURNAMENTS

Chapter 1

SINGLE ELIMINATION TOURNAMENT

HOW IT WORKS

In a single elimination tournament, entries (individuals or teams) are matched against each other such that winners of contests advance to the

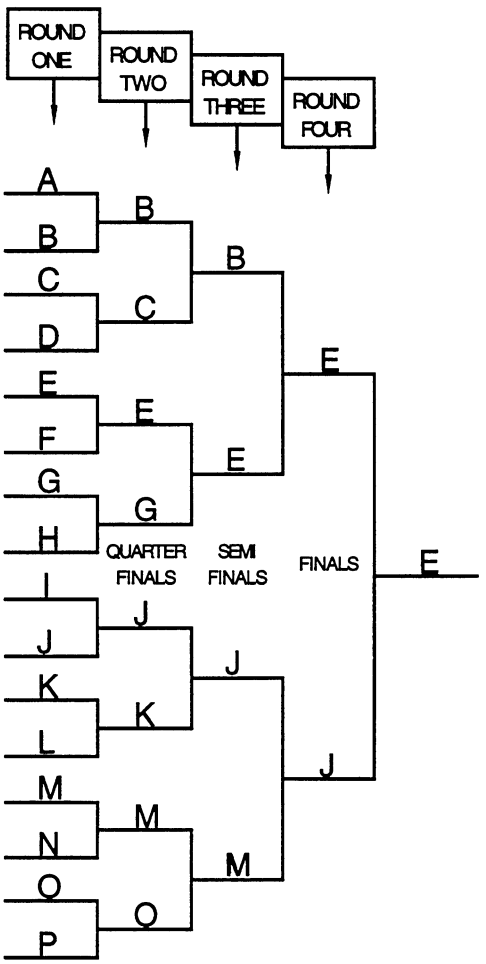

Figure 1.

next round of play and losers are eliminated from further participation. The tournament bracket (Fig. 1) consists of a number of horizontal lines on which entries are placed one to each line in the first round. The lines are vertically connected to designate that Entry A plays Entry B, Entry C plays Entry D, and so forth. Horizontal lines in rounds subsequent to the first are used for placement of the winners of the contests in the previous round. In Figure 1, rounds of play beyond the first have exactly half the number of horizontal lines as the previous round. That corresponds to the concept that, for each contest played, one entry advances and the other is eliminated from the tournament. A progression of winners through the tournament is depicted in Figure 1, with Entry E being the tournament champion. In a four-round tournament, Round 4 is called the "finals," Round 3 is the "semi-finals," and Round 2 is the "quarter-finals."

BRACKET FORMATION

The number of entries used in the bracket for Figure 1 is sixteen (N=16), and that number is known as a "power of two." Powers of two proceed as follows: 2-4-8-16-32-64-128, etc. Whenever the number of entries in a tournament is a power of two, the number of horizontal lines in each round is a power of two, and each line in the first round is occupied by an entry. However, when the number of entries is something other than a power of two (21, for example), every line in the first round of the bracket *is not* occupied by an entry. The unoccupied lines represent "byes." Entries that are matched up on the bracket with byes get free passage into the next round, without having to play another entry.

It is traditional to place all byes in the first round, so subsequent rounds are a power of two. If N=6, for example, the bracket *would not* be drawn with six horizontal lines in the first round, as depicted in the left bracket of Figure 2. That would result in a bye in the second round, with the winner of the bottom-most pairing advancing directly to the finals, thereby avoiding a second-round contest. The "correct" way to draw the bracket is shown on the right side of Figure 2. Note that the bracket is drawn with eight lines in the first round, and the word "bye" appears on the second and seventh lines. That means Entry A and Entry F automatically advance to the second round. The reason for the exact placement of the byes on lines two and seven is explained later.

When the number of entries is not a power of two, the number of horizontal lines necessary for the formation of the first round of play is equal to the next-higher-power-of-two (NHPT) relative to the number of entries. For example, the next-higher-power-of-two from N=12 is 16. Figure 3 shows that

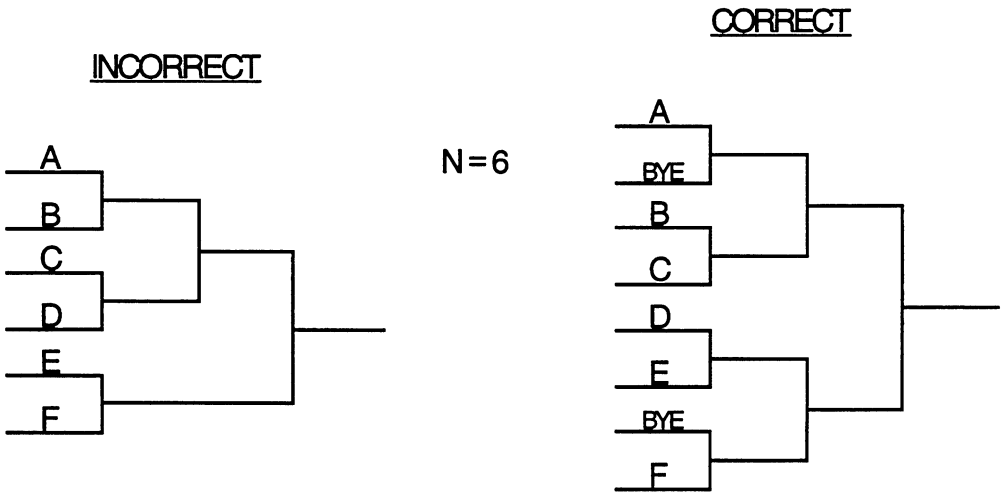

Figure 2.

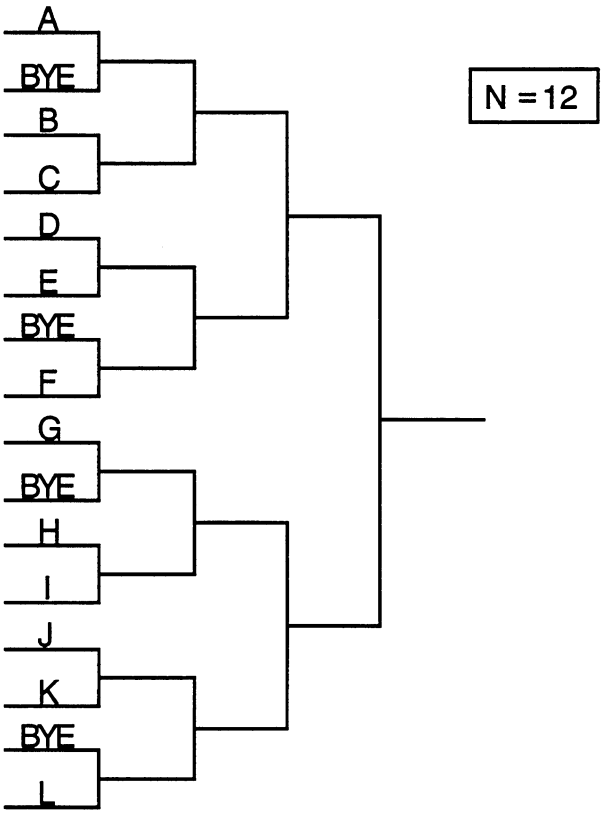

Figure 3.