UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

APPLICATION OF CIRCLE METHOD IN SCHEDULING ROUND-ROBIN TOURNAMENTS AND THE CARRY-OVER EFFECTS

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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ABSTRACT

In a round-robin tournament, each pair of teams play every other team a fixed amount of times amid the tournament. Circle Method or Polygon method is broadly utilized in the game sector to produce timetable for this round-robin competition. Carry-over effect on the other hand can be defined as, if team A were playing team B in their previous round-robin tournament match and is now playing team C, team C is said to have a carry-over effect because of team B. Often there are some difficulties faced by the sport tournaments' organizer when scheduling the round-robin tournaments. The difficulties include the level of integrity of the members of the organizing committee and human errors in creating a great and solid timetable which then will lead to unfair match between the teams or the participants. Thus, the objectives of this study are to develop timetable of round-robin tournament using Circle Method and to determine the carry-over effects value of the timetable. We develop a schedule using Circle Method and calculate the carry-over effects value of data obtained from SUKMA 2018 Bola Sepak which consists of 14 teams. Our result shows that the schedule generated using Circle Method formula describes every team plays each other precisely once in every round which indeed supported the definition of round-robin tournament which was defined by (van't Hof, Post, & Briskorn, 2010). The result shows that the carry-over effects value for that schedule is 1,612. Here, we also show that the carry-over effects value of schedule using Circle Method is higher than any other schedules by showing one more schedule using other method which is permutation and its carry-over effects value. The result shows that the carry-over effects value for that timetable is 390 which is indeed smaller than the carry-over effects value of schedule using Circle Method. This result supported research by Lambrechts, Ficker, Goossens, and Spieksma (2016) which stated that round-robin competition using Circle Method have the largest carry-over effects value. Overall the study makes several contributions in scheduling the round-robin tournament. First, it is shown that the schedule of round-robin tournament can be done by using Circle Method. Furthermore, we also showed that the conjecture stated by past researcher that the Circle Method created a timetable with largest carry-over effects value is true.