

Rounds – Competitors in each division will participate in three rounds, with the lowest time score of the three rounds used to determine their competition score. The competition scores of all competitors in a given division will be compared, and the individual/team with the lowest score will be the winner of that division. In case of a tie, the second lowest scores of the three rounds for those competitors will serve as the tie breaker.

Competitors – The competition is open to undergraduate or graduate students who are IIE members.

Designs – There are no limitations on the method or apparatus design with the following exceptions:

1. The method/design must be safe for competitors and observers.
2. The design must not violate existing patents.

Prizes – The following prizes are suggested for student regional conference competitions.

Solo manual competition	
First Place only	\$50
Team manual competition	
First Place only	\$200
Team automated competition	
First Place	\$300
Second Place	\$200
Third Place	\$100

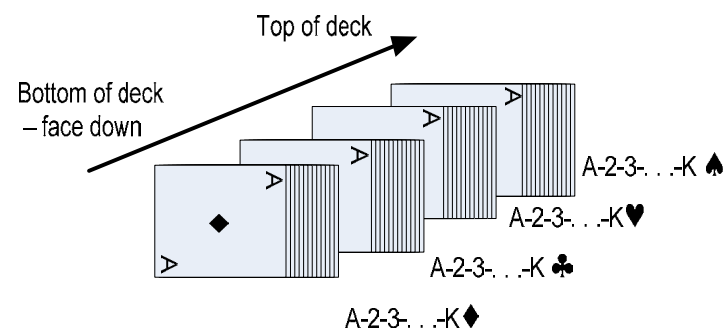
In each IIE Region, the winning team in each of the three divisions will have the right to advance to the international competition at the IIE annual conference in May.

OrderCards

IIE Student Regional and National Conference Design Competition

Introduction

The OrderCards competition is simple but challenging. A shuffled deck of 52 standard Bicycle® brand playing cards is placed face down into a 4.5”x 3.5” rectangular area marked in the center of a standard square folding card table (34”x34”). A clock is started and the competitor(s) must sort the cards into an “as-new” ordered arrangement (A-2-3-4-5-6-7-8-9-10-J-Q-K, within suit, and Diamonds, Clubs, Hearts, and Spades suit order – See illustration below) and return the ordered deck to the marked area to stop the clock. Time is added for errors in ordering of the cards or for failure to place the deck face down completely within the marked area.



A competition designed by Dr. John S. Usher,
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Regional and National Conference Divisions

The regional and national conference competitions include three divisions: 1. solo manual ordering, 2. team manual ordering, and 3. team automated ordering as follows.

Solo Manual Competition – Each competitor manually orders the deck, without the use of any apparatus or assisting devices, and returns the ordered deck to the marked area in the fastest possible time. Each student chapter may enter two students in the solo regional competition.

Team Manual Competition – Each team of four competitors manually orders the deck, without the use of any apparatus or assisting devices, and returns the ordered deck to the marked area in the fastest possible time. Each student chapter may enter two four-person teams in the manual regional competition.

Team Automated Competition – Teams in this competition are unlimited in size and must utilize a semi- or fully-automated apparatus to assist in some part of the ordering process. Students are allowed to touch the cards during the ordering process. The student teams are expected to design and build any apparatus used. Any apparatus used (including any computer) must completely fit within the volume of space above the table surface, bounded by the table dimensions, and stay within that area for the entire duration of the run. Only electrical cords may break the vertical planes coinciding with the table edges. At most four team members may be at the table during the competition. Each student chapter may enter one team in the semi/fully-automated regional competition.

Rules

Card Table – The card table must be a standard square folding card table (34”x34”). The table must be unfolded and set upright with legs extended. The table cannot be modified in any way.

For the semi/fully-automated competition, the apparatus may be affixed to the table such that the method used is non-permanent and non-damaging to the table. The apparatus must allow the deck of cards to be placed on the table surface in the 4.5”x3.5” rectangle in the center of the table. All of the apparatus/equipment, including any computer, must reside on the table surface or above the table surface in the volume of space bounded by vertical planes coinciding with the sides of the table. Teams may furnish their own tables or request a table prior to the competition. Tables furnished by the team will be inspected prior to the competition.

Cards – A standard 52-card deck of red or blue Bicycle® brand playing cards will be furnished. The card size is 3.5”x2.5”. Cards may not be altered in any way. Cards will be placed in random order prior to the start of competition.

Scoring – The time in seconds for completing the ordering task will serve as the score. Timing will begin when the competition judge announces “Go” and will end when the competitor’s hand or mechanism placing the final card in the center rectangle exits the volume of space defined by the rectangle. Time penalties will be added for rule violations, as follows:

1. A penalty will be added for not returning the deck to the rectangle. Upon return, all cards must reside face down within the volume of space above the 4.5”x3.5” rectangle in the center of the table, with the bottom card touching the table surface. Any cards breaking the vertical plane defined by the rectangle will result in a single 10-second time penalty.
2. Errors in sorting will also receive a time penalty. A card or suit out of sequence will be counted as an error. The time penalty will be determined by the following equation.

$$\text{Time penalty (in seconds)} = \begin{matrix} 10(\text{number of errors})^2 & \text{for number of errors} \leq 3 \\ 1000 & \text{for number of errors} > 3 \end{matrix}$$