A.J. Martin's solution of the Hungarian problem.

The day after I had shown EWD765 to Alain J. Martin, he told me a proof of Lemma 2 using mathematical induction. Lemma 2 was:

The game terminates *or* the difference between the largest and smallest value in the bag is unbounded.

Assume Lemma 2, which is true for the empty bag, to hold for a bag with N integers. Consider a non-terminating game for a bag with N+1 integers, and consider the two mutually exclusive cases

a) there exists a value X that, from a certain moment, remains permanently in the bag; from that moment onwards the game is identical to the corresponding game with the N other integers.

b) no value remains permanently in the bag; the largest value in the bag will increase and the smallest value will decrease, both beyond any bound. (Let, at a given moment X be the largest element in the bag and observe the state after the move in which X disappeared; for the conclusion it is irrelevant whether, prior to that move, X was still the maximum element.)

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