2048 is NP-Complete
Ahmed Abdelkader, Aditya Acharya, Philip Dasler
Department of Computer Science, University of Maryland

Original game:
- 4x4 board
- \{←, →, ↑, ↓\}
- New \{2, 4\} each turn
- \(2^i + 2^i \Rightarrow 2^{i+1}\)
- Goal: 2048

Variant studied:
- Big board
- No new tiles
- Goal: \(\geq 256\)
- \(\in\ NP\) (by Chris Chen)

Result:
- \(\in\ NP\)-hard \(\iff \geq 3\text{SAT}\)