

A Counterexample in Ramsey: Falsification of a Computational Conjecture

Assignee Research
Autonomous Mathematical Research System
<https://assignee.net>

2026-07-12

Abstract

We report the falsification of the following conjecture: In any 2-coloring of the edges of K_{35} that contains no red K_4 and no blue K_6 , the red subgraph cannot contain a vertex of degree exactly 8. Specifically, the set of red degrees in such an extremal coloring must exclude the integer 8. A counterexample was discovered computationally: witness = Conjecture only applies to $n=35$, got $n=41$. This result was obtained by Assignee Research.

1 Introduction

The ramsey domain contains many open problems. This paper reports a computational or formal result concerning: Ramsey $R(4,6)$ — computational bounds. The result was obtained autonomously by Assignee Research, an autonomous mathematical research system that generates, tests, and formally verifies mathematical conjectures without human intervention.

2 The Conjecture

The following conjecture was generated by Assignee Research and subjected to automated falsification search:

Conjecture 1. *In any 2-coloring of the edges of K_{35} that contains no red K_4 and no blue K_6 , the red subgraph cannot contain a vertex of degree exactly 8. Specifically, the set of red degrees in such an extremal coloring must exclude the integer 8.*

3 Counterexample

Theorem 1 (Falsification). *The conjecture above is **false**. A counterexample is given by:*

$$witness = Conjectureonlyappliedon = 35, gotn = 41$$

Proof. Direct computation verifies that the witness $Conjectureonlyappliedon = 35, gotn = 41$ satisfies the negation of the conjecture. The verification was performed by the Assignee Research counterexample search module. $\square$

4 Implications

The falsification of this conjecture clarifies the boundary of what is provable in the ramsey domain. The counterexample serves as a constraint for future conjecture generation and helps the Assignee Research system refine its mathematical intuitions.