

## Povzetek

V diplomskem delu s pomočjo markovskih verig obravnavamo vprašanja, ki si jih lahko zastavi igralec pri družabni igri kače in lestve. Na začetku predstavimo zgodovino, namen in navodilo igranja dane igre. Za lažje razumevanje navodil navedemo tudi primer igranja igre na manjši igralni plošči. Temu sledi spoznavanje nekaterih osnovnih značilnosti markovskih verig. V osrednjem delu diplomske naloge predstavimo povezavo igre kače in lestve z markovskimi verigami ter izračunamo odgovore na obravnavana vprašanja. Na koncu razložimo še programe zapisane v programskem jeziku MatLab, ki jih uporabimo za izračun podatkov v osrednjem delu diplome.

**Math. Subj. Class. (2010):** 60J10

**Ključne besede:** verjetnost, markovske verige, namizna igra, Kače in lestve

## Abstract

The thesis uses Markov chains to discuss the questions that a person playing the board game of Snakes and Ladders may have. It first presents the history of the game, its purpose and instructions. To facilitate understanding, the thesis contains an example of playing the game on a smaller board. Moreover, it describes some of the basic characteristics of Markov chains. The main section of the thesis explains the connection of the said board game with Markov chains and provides calculated answers to the relevant questions. Finally, we explain the computer programs written in the programming language MatLab which are used for the calculations in the main section of the thesis.

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**Keywords:** probability, Markov chains, board game, Snakes and ladders

## Literatura

- [1] S. C. Althoen, L. King in K. Schilling, *How long is a game of Snakes and Ladders?*, *Mathematical Gazette* **77** (1993) 71–76.
- [2] L. A. Cheteyan, S. Hengeveld in M. A. Jones, *Chutes and Ladders for the Impatient*, *The College Mathematics Journal* **42** (2011) 2–8.
- [3] C. M. Grinstead in J. L. Snell, *Introduction to Probability*, 2nd ed., American Mathematical Society, Providence RI, 1997.
- [4] *Markov chains*, [ogled 30. 10. 2012], dostopno na <http://www.aw-bc.com/greenwell/markov.pdf>.
- [5] M. Omladič, *Uvod v teorijo markovskih verig*, [ogled 30. 10. 2012], dostopno na [http://www.fmf.uni-lj.si/~sega/verj2/1213/markovske\\_prvo.pdf](http://www.fmf.uni-lj.si/~sega/verj2/1213/markovske_prvo.pdf).
- [6] *Snakes and Ladders*, [ogled 10. 11. 2012], dostopno na [http://en.wikipedia.org/wiki/Snakes\\_and\\_Ladders](http://en.wikipedia.org/wiki/Snakes_and_Ladders).
- [7] *Snakes and Ladders History and Rules*, [ogled 10. 11. 2012 ], dostopno na <http://www.scribd.com/doc/20048774/Snakes-and-Ladders-History-Rules>
- [8] *The History of Snakes and Ladders*, [ogled 10. 11. 2012], dostopno na [http://www.ehow.com/about\\_5098014\\_history-snakes-ladders.html](http://www.ehow.com/about_5098014_history-snakes-ladders.html)
- [9] *Snakes and Ladders or Chutes and Ladders*, [ogled 10. 11. 2012], dostopno na <http://www.gamesmuseum.uwaterloo.ca/VirtualExhibits/Whitehill/snakes/index.html>
- [10] *A History of Snakes and Ladders*, [ogled 10. 11. 2012], dostopno na <http://www.gamesfromeverywhere.com/a-history-of-snakes-and-ladders/>
- [11] *Life is a game of Chutes and Ladders*, [ogled 10. 11. 2012], dostopno na <http://communities.washingtontimes.com/neighborhood/spiritually-yours/2012/oct/7/life-game-chutes-and-ladders/>
- [12] *Slika igre Kače in lestve*, [ogled 12. 12. 2012], dostopno na <http://www.pointlessmuseum.com/museum/blog/wp-content/uploads/2010/10/spearsnakescomplete.jpg>.
- [13] B. Lavrič, *Elementarna geometrija*, zapiski predavanj, FMF, 2013.