PYTHON PROJECT SYNOPSIS REPORT

FOR

The Python Snake Game: A Classic Console-Based Arcade Experience

Submitted by

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## Synopsis Report

### Project Title

The Python Snake Game: A Classic Console-Based Arcade Experience

### Abstract

Snake Game is a classic arcade-style entertainment that's endured for generations. This Python version is simple, challenging, and customizable. Guide the snake through obstacles and rewards with intuitive controls. Enjoy the nostalgic charm of pixelated graphics and straightforward mechanics. It's a captivating journey of growth and strategy that will keep you hooked for hours.

### Introduction

The Snake Game has been a cultural icon since the 1970s, captivating players with its addictive gameplay and minimalist design. It found new life on mobile phones in the late 1990s, becoming a staple feature in millions of devices worldwide. This Python implementation offers an experience that pays homage to its arcade roots while embracing modern technology. In this introduction, we explore the mechanics, features, and user experience of the Snake Game's Python code implementation. From maneuvering a growing snake through narrow corridors to achieving high scores, the game promises an immersive and rewarding experience for players of all ages. Join us as we delve into the world of this timeless classic reimagined for a new era of gaming enthusiasts.

# Literature Survey

In [1] authors explore various algorithms to complete a challenging game, utilizing both brute force and human intervention. The goal is to create a perfect snake on a large grid, surpassing human capabilities. The project deepens students' understanding of algorithms, coding skills, and

exposes them to real-world challenges. [2] involves ten stages, from problem collection to large- scale production, testing, and validation of a snake and ladder game model. The model, developed at Alphabet Kindergarten in Tasi Malaya City, aims to improve gross and fine motor physical abilities in young children. [3] presents a zonation method for training reinforcement learning agents in a cooperative double snake game, addressing real-world issues like coordination in autonomous driving cars and collaborative mobile robots in warehouse applications. The deep Q- network algorithm is used, with distinct state and reward functions assigned to each agent. The approach is efficient in limited computing resources and training time environments. In [4] authors aim to develop a chemistry learning media using a joyful learning with snakes and ladders game on stoichiometric material to improve student learning outcomes. The research uses the R&D method with the 4D model by Thiagarajan, which consists of four main stages: define, design, develop, and disseminate. The game has only reached the development stage and was tested using the One Group Pretest-Posttest Design system. The results show that the game is suitable for improving student learning outcomes, with a feasibility score of ≥ 4 in the feasible to very feasible category. The game's effectiveness was declared effective, with an average N-gain score of 0.79 with high criteria. [5] uses a quantitative approach and a Quasi Experimental Pretest-Posttest Control Group Design to analyze students' interest in learning mathematics. The results show a difference in interest between students taught using the snakes and ladders game and those taught using conventional learning. The experimental class showed a higher average N-Gain value than the control class, indicating an increase in interest in learning mathematics using the game at SD 53 Banda Aceh. In [6] authors aim to apply reinforcement learning to develop an AI snake game agent. The snake learns actions based on feedback from the environment, using a deep reinforcement learning model. The state is an array of 11 input values, representing three possible actions: Straight, Right Turn, and Left Turn. [7] used Pygame and OpenCV to create a game using motion gestures, demonstrating the potential of computer vision and natural user interfaces for interactive, immersive gaming experiences, comparable to traditional keyboard controls. In [8] authors compare search algorithms used by human agents and AI using the snake game. It assesses informed and uninformed search strategies, Hamiltonian search, and various AI techniques. Results show that Human Agent performs poorly compared to Depth-First Search, Breadth-First Search, Hamiltonian Search, and Best-First Search algorithms, while A \* Search algorithm significantly outperforms them. [9] proposes a novel method to encrypt hidden data in the popular online Snake game, focusing on hiding messages in the snakes' food grid. In [10] the authors investigate the impact of dental health education on the behavior and oral hygiene index of deaf children using a snake and ladder game. 123 students aged 10-12 from three Special Schools in Yogyakarta, Indonesia, were surveyed. Results showed significant differences in dental health maintenance behavior and the Oral Hygiene Index Simplifies (OHI-S) index in the treatment group.

### Development

The development of the Snake Game involved conceptualization, design, programming, and testing. Developers outlined the core mechanics and design elements of the game, creating an engaging and intuitive player experience. Programmers implemented the game's mechanics, optimized performance, and refined gameplay mechanics through iterative development and testing. Inspiration, experimentation, and feedback were key to enhancing the game's quality and appeal. Once development was complete, the game was released to the public through various platforms, with marketing and promotion efforts to attract players. Overall, the development of the Snake Game combined creative vision, technical expertise, and iterative refinement to create an enjoyable gaming experience.

### Objectives

People choose to play the Snake Game for several reasons. It evokes a sense of nostalgia for simpler times, when mobile phones had basic games pre-installed. Its straightforward mechanics make it easy to pick up and play, while its addictive gameplay keeps players engaged for hours. It offers quick and casual entertainment, perfect for passing the time. The game presents a challenge that requires skill and strategy to master, appealing to those who enjoy a challenge. It allows players to compete for high scores, adding an element of competition and motivation. Lastly, it can be a relaxing and stress-relieving activity for players. Overall, the Snake Game offers a blend of nostalgia, simplicity, challenge, and entertainment that appeals to a wide range of players and remains a timeless classic in the world of gaming.

### Methodology

The methodology for developing the Snake Game involves several key steps:

* 1. Conceptualization: Define the game's objectives, mechanics, and visual style.
  2. Design: Create mockups, storyboards, and wireframes to visualize the game's structure and aesthetics.
  3. Programming: Implement the game's mechanics using a suitable programming language and game development framework.
  4. Testing and Iteration: Identify and address bugs, glitches, and gameplay issues through rigorous testing and feedback.1

Optimsation

Conceptualizat ion

Design

Polish and Finalization

Release and Distribution

Programmin g

Testing and Iteration

Post-Release Support

* 1. Optimization: Fine-tune the game for performance, stability, and compatibility across different devices and platforms.
  2. Polish and Finalization: Add visual and audio enhancements to enhance the overall presentation and immersion of the game.
  3. Release and Distribution: Publish the game on digital storefronts and other distribution platforms while marketing and promoting to attract players.
  4. Post-Release Support: Continue providing support and updates to maintain the game's longevity and relevance in the gaming landscape.

Steps:

# PERT Chart

EVALUATOR

ASSIGNED

SYNOPSIS

PRESENTATIO N

Dr. Sugandha

Sharma

DATE : 22/04/24

START

(28/03/2 FINISH

4)

DISCUSSION ON TOPIC

FORM

SUBMISSION

Dr. Sugandha Sharma

DATE : 20/04/24

## References

1. Weinberger, W., Liang, J., & Chen, X. (2024, March). Perfect Snake: Exploring Algorithms Through the Snake Game. In *Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 2* (pp. 1851-1852).
2. Marwan, I., Wahidah, I., & Rohayati, N. (2024). Development of the Snake and Leader Game Model to Improve Physical Motor in Early Childhood. *Journal of SPORT (Sport, Physical Education, Organization, Recreation, and Training)*, *8*(1), 297-312.
3. Hadiyanto, M. Y., Harsono, B., & Karnadi, I. (2024). Zonation Method for Efficient Training of Collaborative Multi-Agent Reinforcement Learning in Double Snake Game. *Advance Sustainable Science, Engineering and Technology*, *6*(1), 02401011.
4. Janah, M., & Mitarlis, M. (2024). Development of Chemistry Learning Media based on Joyful Learning with Snakes and Ladders Game on Stoichiometry material to Improve Student Learning Outcomes. *Hydrogen: Jurnal Kependidikan Kimia*, *12*(1), 135-150.
5. Ryaz, F., Sari, R. P., & Rahmawati, L. (2024). Education to Prevent Early Marriage in Teenagers Using The Snake and Ladder Game. *proceedinginternational*, *4*, 114-118.
6. Hossain, M. M., Fakokunde, A., & Olaolu, O. I. (2023). A Deep Reinforcement Learning Agent for Snake Game. *International Journal of Artificial Intelligence*, *10*(2), 92-102.
7. Inamdar, F. M., Jambhulkar, R., Patil, I., & Misal, A. (2023, April). Snake Game with Motion Control Using Computer Vision. In *International Conference on Soft Computing for Security Applications* (pp. 515-541). Singapore: Springer Nature Singapore.
8. Mim, S. S., Islam, M. N., & Logofatu, D. (2023, May). Examining Various Search Algorithms in AI With Appropriate Literature and Their Performances Against a Human Agent in the Snake Game. In *2023 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1-10). IEEE.
9. Mahato, S. (2023, May). Snake-Stega: A snake game-based steganography scheme. In *2023 Third International Conference on Secure Cyber Computing and Communication (ICSCCC)* (pp. 167-171). IEEE.
10. A’yun, Q., & Sulistyani, H. (2023). Effect of the Snake and Ladder Game on Behavior and OHI-S Index of Deaf Children. *International Journal Of Multidisciplinary Research And Analysis*, *6*(09).