

# **A k-Armed Bandit with Thompson Sampling for Movie Recommendation**

A PROJECT REPORT

*Submitted by,*

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*Under the guidance of,*

**Dr. ALAMELU MANGAI JOTHIDORAI**

*in partial fulfillment for the award of the degree*

*of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING**

**(ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)**

**At**



**PRESIDENCY UNIVERSITY**

**BENGALURU**

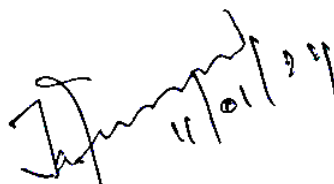
**JANUARY 2024**

**PRESIDENCY UNIVERSITY**  
**SCHOOL OF COMPUTER SCIENCE ENGINEERING &**  
**INFORMATION SCIENCE**  
**CERTIFICATE**

This is to certify that the Project report “A K-ARMED BANDIT WITH THOMPSON SAMPLING FOR MOVIE RECOMMENDATION” being submitted by “NETRA S BANKAR, BHAVISH R, CHUKKA MANOJ KUMAR REDDY, ASHOK REDDY CHILAKA with roll numbers “20201CAI0164, 20201CAI0219, 20201CAI0199, 20201CAI0203” in partial fulfilment of requirement for the award of degree of Bachelor of Technology in Computer Science and Engineering is a Bonafide work carried out under my supervision.

  
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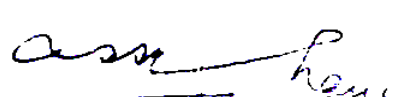
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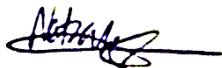
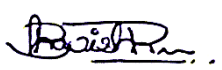
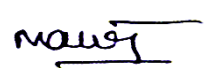

## **SCHOOL OF COMPUTER SCIENCE ENGINEERING & INFORMATION SCIENCE**

### **DECLARATION**

We hereby declare that the work, which is being presented in the project report entitled **“A K-ARMED BANDIT WITH THOMPSON SAMPLING FOR MOVIE RECOMMENDATION”** in partial fulfilment for the award of Degree of **Bachelor of Technology in computer science and engineering**,

is a record of our own investigations carried under the guidance of **DR. ALAMELU MANGAI School of Computer Science Engineering , Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

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## ABSTRACT

With the ever-growing library of content on streaming platforms like Netflix, amazon providing users with personalized and engaging recommendations is crucial for enhancing their viewing experience. This paper explores the application of Multi-Armed Bandits (MAB) algorithms to optimize the recommendation system on Netflix. MAB, a branch of reinforcement learning, offers a dynamic approach to balancing exploration and exploitation, making it particularly well-suited for the evolving and diverse preferences of Netflix users.

The proposed system leverages MAB to dynamically allocate resources to different content recommendation strategies, continuously adapting to user feedback and evolving viewing habits. Traditional recommendation systems often struggle with the exploration-exploitation trade-off, either focusing too heavily on known preferences or exploring new content at the expense of user satisfaction. MAB algorithms address this challenge by intelligently allocating resources to explore new content and exploit successful recommendations based on real-time user interactions.

The study involves the development and integration of a MAB-based recommendation model within Netflix's existing recommendation infrastructure. Through experimentation and A/B testing, the performance of the MAB-enhanced system is evaluated against baseline recommendation methods. The metrics include user engagement, click-through rates, and user satisfaction, among others.

Preliminary results demonstrate the potential of the MAB approach to significantly improve the quality of recommendations on e-commerce in websites. By adapting in real-time to user behaviour, the MAB-based system achieves a more personalized and responsive recommendation experience. The findings suggest that MAB algorithms can enhance the efficiency and effectiveness of content recommendations on large-scale streaming platforms, ultimately leading to increased user satisfaction and prolonged engagement.