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# Analysis and Supression of Opioid Spread

## Summary

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**key words :** Transition matrix; Multi-level thresholds; Information entropy

## MEMO

FROM: Team 2504496 , MCM A/B/C/...

To: The group of Governors

Date: January 28, 2019

Dear Officials:

It is our honor to help you with analyzing the spread and characteristics of opioid. We are writing this letter to report our findings.

xxxxxxxxxx

Sincerely yours  
MCM C Team 1917694

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Figure 1:

# 1 Introduction

## 1.1 Background

2024 年巴黎奥运会奖牌榜显示，美国和中国在金牌数上并列第一（各 40 枚），但美国以总奖牌数（126 枚）领先。法国作为东道主，金牌数排名第五，但总奖牌数排名第四，体现了东道主可能的优势。此外，多个国家首次获得奥运奖牌（如多米尼克、圣卢西亚等），而仍有 60 多个国家尚未获得奖牌。

The medal standings from the 2024 Paris Olympics indicate that the United States and China are jointly positioned at the top in gold medal count, each securing 40 gold medals. However, the United States holds a lead in the overall medal tally with a total of 126 medals. As the host nation, France ranked fifth in terms of gold medals but fourth in total medals, demonstrating the potential advantages of being the host. Furthermore, several countries have won Olympic medals for the first time (such as Dominica, Saint Lucia, etc.), while 60 countries still haven't won any medals.

## 1.2 Restatement and Analysis of the Problem

## 1.3 Overview of Our Work

- 111. ...

- 222. ...

- 1) ...

- 2) ...

- 3) ...

- 4) ...

## 2 Assumptions and Justification

To simplify the problem and make it convenient for us to simulate real-life conditions, we make the following basic assumptions, each of which is properly justified.

- 111. ...

- 222. ...

## 3 List of Notations

| Symbols   | Description                          | Unit                                   |
|-----------|--------------------------------------|--|
| $h$       | Convection heat transfer coefficient | $\text{W}/(\text{m}^2 \cdot \text{K})$ |
| $A$       | Aera                                 | $\text{m}^2$                           |
| $a, b, c$ | The size of a bathtub                | $\text{m}^3$                           |

where we define the main parameters while specific value of those parameters will be given later.

## **4 Data Pre-processing**

### **4.1 Outlier Handling**

### **4.2 Missing Value Handling**

### **4.3 Tag Encoding of String Type Data**

## **5 Task 1: xxx**

## **6 Task 2: xxx**

## **7 Task 3: xxx**

## **8 Task 4: xxx**

## **9 Sensitivity Analysis**

## **10 Strength and Weakness**

### **10.1 Strength**

### **10.2 Weakness**

## **11 Further Discussion**

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## References

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## Appendices