

# CPSC-354 Report

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**Abstract**

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## 1 Introduction

## 2 Week by Week

### 2.1 Week 1

#### 2.1.1 Notes and Exploration

Place holder for notes

#### 2.1.2 Homework 1

This week's HW is regarding the MU puzzle, and its relevance and application to formal systems. Here we use the MU puzzle to practice and familiarize ourselves with staying within the confines of a formal system. We are given 4 rules/restrictions, which is referred to as the "Requirement of Formality". Our formal system consists of these 4 rules:

1. RULE I: If you possess a string whose last letter is I, you can add on a U at the end.
2. RULE II: Suppose you have Mx. Then you may add Mxx to your collection.
3. RULE III: If III occurs in one of the strings in your collection, you may make a new string with U in place of III.
4. RULE IV: If UU occurs inside one of your strings, you can drop it.

With these four rules in mind, we have one objective: stay within the rules and produce "MU" from "MI". As I worked through the rules, I logically deduced these points in this order:

1. When doubling I's, after the first I, the number of I's always remain even
2. When applying RULE III, the remaining I's stay even, meaning after the U conversion, there is always a even number of remaining I's
3. The MIU pattern gets stuck in a infinitely repeating IU pattern after applying RULE II
4. you can never get rid of I's because of item number 2

From the above observations we can see that the I's will either always appear in even pairs, or be accompanied by a 'U', which means that we either have to divide our even I's by 3(rule 3), which always results again in a even I, or have I be stuck with a U in a string with no way to get rid of the I alone. From this we can conclude(especially from items 2 and 4) that with our formal system, we cannot reach MU from MI with our current system without modifications.

### **3 Essay**

### **4 Evidence of Participation**

### **5 Conclusion**

### **References**

[BLA] Author, [Title](#), Publisher, Year.