

# 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 MU Puzzle

It is impossible to solve the MU puzzle. The only way to change the amount of I's is to double them with rule 2, or subtract 3 with rule 3. In order to get rid of all the I's you would have to have them in groups of 3. A power of x is divisible by 3 only if x is a multiple of 3, because the prime factorization of a number must include the prime number 3 for the number to be divisible by 3. So, you would have to get an original group divisible by 3, which is impossible.

### 2.2 Week 2

#### 2.2.1 Rewriting

1.  $A = \{\}$   
Empty ARS  
Terminating: Yes

Confluent: Yes  
 Has Unique Normal Forms: Yes

2.  $A=\{a\}$  and  $R=\{\}$

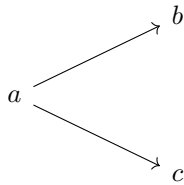
$a$   
 Terminating: Yes  
 Confluent: Yes  
 Has Unique Normal Forms: Yes

3.  $A=\{a\}$  and  $R=\{(a,a)\}$



Terminating: No  
 Confluent: Yes  
 Has Unique Normal Forms: No

4.  $A=\{a,b,c\}$  and  $R=\{(a,b),(a,c)\}$



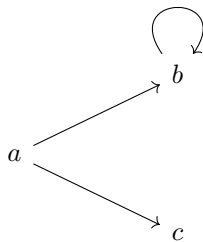
Terminating: Yes  
 Confluent: No  
 Has Unique Normal Forms: No

5.  $A=\{a,b\}$  and  $R=\{(a,a),(a,b)\}$



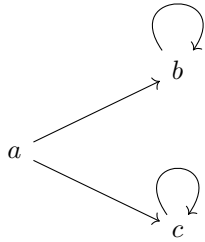
Terminating: No  
 Confluent: Yes  
 Has Unique Normal Forms: Yes

6.  $A=\{a,b,c\}$  and  $R=\{(a,b),(b,b),(a,c)\}$



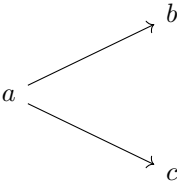
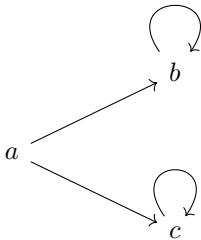


Terminating: No  
 Confluent: No  
 Has Unique Normal Forms: No

7.  $A=\{a,b,c\}$  and  $R=\{(a,b),(b,b),(a,c),(c,c)\}$



Terminating: No  
 Confluent: No  
 Has Unique Normal Forms: No

confluent	terminating	has unique normal forms	example
True	True	True	$a$
True	True	False	IMPOSSIBLE
True	False	True	
True	False	False	
False	True	False	
False	False	True	IMPOSSIBLE
False	False	False	

### 3 Essay

### 4 Evidence of Participation

### 5 Conclusion

### References

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