#### GEORGIA STATE UNIVERSITY

Department of Mathematics and Statistics



# METHODS FOR SOLVING INITIAL VALUE PROBLEMS - A Report

ВҮ

JESSE ANNAN

April 15, 2023

### Contents

LIST OF ABBREVIATIONS			i
1	INT	TRODUCTION	1
2	METHODS		2
	2.1	The Euler's Method	2
	2.2	The Modified Euler's Method	2
	2.3	The 2nd-Order Runge-Kutta Method	2
	2.4	The 4th-Order Runge-Kutta Method	2
	2.5	The Adams-Bashforth 4th-Order Explicit Method	2
	2.6	The Adams 4th-Order Predictor-Corrector Method	2
	2.7	The Runge-Kutta-Fehlberg Method	2
	2.8	The Predictor-Corrector Method with variable step sizes	2
3	NU	MERICAL EXPERIMENTS	3
$\mathbf{RI}$	REFERENCES		

## List of Abbreviations

# Chapter 1 INTRODUCTION

### Chapter 2

#### **METHODS**

- 2.1 The Euler's Method
- 2.2 The Modified Euler's Method
- 2.3 The 2nd-Order Runge-Kutta Method
- 2.4 The 4th-Order Runge-Kutta Method
- 2.5 The Adams-Bashforth 4th-Order Explicit Method
- 2.6 The Adams 4th-Order Predictor-Corrector Method
- 2.7 The Runge-Kutta-Fehlberg Method
- 2.8 The Predictor-Corrector Method with variable step sizes

# Chapter 3 NUMERICAL EXPERIMENTS

### REFERENCES