SOLVING STANDARD DYNAMIC MOTION PROBLEMS USING FORTRAN

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ABSTRACT

This project, "**Solving Standard Dynamic Motion Problems Using Fortran**" is essentially a demonstration of how computer programmes can improve the solutions to engineering problems in terms of efficiency and accuracy; narrowed down to how common kinematics and kinetics problems can be more effectively solved by means of Fortran programming. The phrase "common kinematics and kinetics problems" refers to problems which are familiar to undergraduate scholars in the sense these problems recurrently appear in any dynamics text/reference book. This project sufficiently covers the topics of Kinematics and Kinetics of Particles, and Kinematics and Kinetics and of Rigid Bodies (both in 2-D and 3-D). The bulk of this dissertation comes from the working and methodology in obtaining the solutions of example problems via both the manual and computerised means, all of which are located in *Chapter V: Presentation of Project*. This dissertation is accompanied by a compact disc containing all of the Fortran programmes written to solve different dynamic motion problems.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

Computing and engineering are two fields having great potentials to improve towards a sophisticated level, and consequently make improvements in other areas. As many would agree; engineering IS mostly complicated, but computers are capable to help simplify engineering works to a certain extent by automating tasks. Thus, it is only sensible to integrate the use of computers in engineering.

This project, "Solving Standard Dynamic Motion Problems Using Fortran" is essentially a demonstration of how computer programmes will improve the solutions to engineering problems; narrowed down to how kinematics and kinetics problems can be effectively solved by means of Fortran programming. The scope of this subject will include Kinematics and Kinetics of Particles, and Kinematics and Kinetics and of Rigid Bodies (both in 2-D and 3-D).

Demonstrations will be done through writing up Fortran programmes to solve various dynamic problems, and comparing the outcome of each with that obtained from manual calculations. Not only this serves as a tool for cross-checking final solutions of problems, comparisons between the two means of solution will purposely illustrate the efficiency and accuracy provided by Fortran.