VIETNAM GENERAL CONFEDERATION OF LABOR

**TON DUC THANG UNIVERSITY**

**FACULTY OF INFORMATION TECHNOLOGY**



**STUDENT NAME – STUDENT ID**

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**FINAL REPORT**

**APPLIED LINEAR ALGEBRA FOR IT**

**HO CHI MINH CITY, 2023**

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**LE NGUYEN CAO DUY**

**FINAL REPORT**

**APPLIED LINEAR ALGEBRA FOR IT**

Advised by

**Ms. Pham Kim Thuy**

**HO CHI MINH CITY, 2024**

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*Ho Chi Minh city, 17th September 2024.*

*Author*

*(Signature and full name)*

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Le Nguyen Cao Duy

**DECLARATION OF AUTHORSHIP**

We hereby declare that this is our own project and is guided by Ms. Pham Kim Thuy; The content research and results contained herein are central and have not been published in any form before. The data in the tables for analysis, comments and evaluation are collected by the main author from different sources, which are clearly stated in the reference section.

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**TABLE OF CONTENT**

[LIST OF FIGURES v](#_Toc152077844)

[LIST OF TABLES vi](#_Toc152077845)

[ABBREVIATIONS vii](#_Toc152077846)

[CHAPTER 1. THEORETICAL BASIS 1](#_Toc152077847)

[1.1 Content 1 1](#_Toc152077848)

[1.2 Content 2 1](#_Toc152077849)

[CHAPTER 2. INTRODUCTION 2](#_Toc152077850)

[2.1 Content 1 2](#_Toc152077851)

[2.2 Content 2 2](#_Toc152077852)

[REFERENCES 6](#_Toc152077862)

# ABBREVIATIONS

|  |  |
| --- | --- |
| BERT | Bidirectional Encoder Representations from Transformers |
| GEC | Grammatical Error Correction |
| MERN | MongoDB, express, react, nodejs |
| MLM | Masked Language Model |
| NLP | Natural Language Processing |
| NSP | Next Sentence Prediction |

# THEORETICAL BASIS

## Content 1

In the era ...

Books, …

## Content 2

The main

# SOLUTIONS

## Question 1:

Given the matrix . Find all values of a for which .

We have:

We have:

## Question 2

Solve the following system of linear equations by using Gaussian Elimination method.

We have:

We have :



We have:

We have:

## Question 3

We have:

We have: Linear combination

We have: Augmented matrix:

From (1) and (2)

## Question 4

We have:

Character polynomial of A is:

Characteristic equation of a is:

With

We have:

We have:

With

We have:

We have:

We have:

We have:

## Question 5

We have:

## Question 6

Use the Gram-Schmidt orthonormalization process to transform the basis for into an orthonormal basis.

Let

We have:

Let

## Question 7

1. Cau 1

We have : Linear independence

We have: Linear combination

1. Cau 2

We have : Linear independence

We have : Linear combination

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