



AL-AZHAR UNIVERSITY  
FACULTY OF ENGINEERING  
COMPUTERS & SYSTEMS ENGINEERING  
DEPARTMENT

## Devault:

*A Blockchain-based, self-hosted, and end-to-end encrypted  
cloud storage.*

A PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN  
SYSTEMS AND COMPUTERS ENGINEERING

*Submitted by:*

**Abd El-Twab M. Fakhry    504055**

**Hossam A. Eissa                504042**

*Supervised by:*

**Dr. Abdurrahman Nasr**

July 24, 2022

# Letter of Approval

The undersigned certify that they have read, and recommended to the Faculty of Engineering for acceptance, a project entitled “Decentralized Vault: A Blockchain-based decentralized encrypted cloud storage” submitted by **Abd El-Twab M. Fakhry** and **Hossam A. Eissa** in partial fulfillment of the requirements for the degree of Bachelor of Science in Systems and Computers Engineering.

---

Examiner Committee President:  
Dr. Abdurrahman Nasr  
SYSTEMS & COMPUTERS ENGINEERING  
DEPARTMENT

---

Project Supervisor:  
Dr. Abdurrahman Nasr  
SYSTEMS & COMPUTERS ENGINEERING  
DEPARTMENT

---

Examiner Member:  
Dr. Abdurrahman Nasr  
SYSTEMS & COMPUTERS ENGINEERING  
DEPARTMENT

---

Examiner Member:  
Dr. Abdurrahman Nasr  
SYSTEMS & COMPUTERS ENGINEERING  
DEPARTMENT

*Date of Approval:*

# Statement of Originality

This statement is to certify that to the best of our knowledge, the content of this thesis is our work. This thesis has not been submitted for any degree or other purposes.

We certify that the intellectual content of this thesis is the product of our work and that all the assistance received in preparing this thesis and sources has been acknowledged.

---

Abd El-Twab M. Fakhry  
Hossam A. Eissa

July 17, 2022

# Acknowledgements

In successfully completing this project, many people have helped me. I would like to thank all those who are related to this project.

Primarily, thanks to ALLAH (s.w.t), the Greatest, the Most Merciful, and the Most Gracious, Whose countless blessings bestowed upon me were kind, talented, and wise teachers, who provided me with sufficient opportunities and enlighten me towards this research work.

I would like to express my deepest and most sincere gratitude to my family for everything they have done for me and all the love they gave to me. My mother, father, sisters, and brother. No words can express my love for them.

I would like to extend my deepest thanks to my supervisor, Dr. Abdurrahman Nasr for giving me the opportunity of undertaking this research work under his determined direction. His support, dedication, encouragement, excellent supervision, and guidance are what made this thesis possible.

Finally, I would like to thank my friends, teams, specially Al-Azhar ICPC Community (AIC), who have helped me with their valuable suggestions and guidance and have been very helpful in various stages of project completion.

Thank You.

# Abstract

The abstract should identify clearly and succinctly the purpose of the project, the methods used, the results obtained and the significance of the results or findings. The abstract must not exceed 300 words. Abstract section gives readers a brief idea about your project, which briefly presents your problem statement and how you can solve it. paragraph. Leave tab with 4 spaces when you start.

KEYWORDS: *Blockchain; Cryptography; Cloud Computing; P2P; Decentralized Applications.*

# Contents

<b>Forewords</b>	<b>i</b>
Statement of Originality . . . . .	ii
Acknowledgements . . . . .	iii
Abstract . . . . .	iv
<b>1 Introduction</b>	<b>1</b>
1.1 Background and Motivation . . . . .	1
1.2 My Dream . . . . .	1
<b>2 Solving <math>P = NP</math></b>	<b>2</b>
2.1 Proof . . . . .	2
<b>3 Geatest Common Divisor</b>	<b>3</b>
<b>Appendix</b>	<b>5</b>
<b>Glossary</b>	<b>6</b>
List of Figures . . . . .	7
Listings . . . . .	8
List of Tables . . . . .	9

# Chapter 1

## Introduction

### 1.1 Background and Motivation

In this section, you should describe the problem that you set out to solve with the project. An introduction might, for example, begin by stating, "The aim of the work described in the Report was to provide a software tool with which people can arrange meetings." Avoid starting a Report with an irrelevant history of information technology.

Explain whatever background the reader will need in order to understand the problem. The background might refer to previous work in the academic literature that provides evidence that the problem is a real and significant problem worth solving. Include a clear and detailed statement of the project aims and provide an overview of the structure of the solution. Please note that the GP2 report (492) should have more literature material than the GP1 (491).

Conventionally, the last part of the introduction outlines the remainder of the Report, explaining what comes in each section. Your report should be organized as follow:

### 1.2 My Dream

I once had a dream, I was doing big brain stuff in that dream [1].

# Chapter 2

## Solving $P = NP$

### 2.1 Proof

See below for irrefutable proof, extreme care and rigour has been shown in this proof by Ethereum Virtual Machine (EVM).

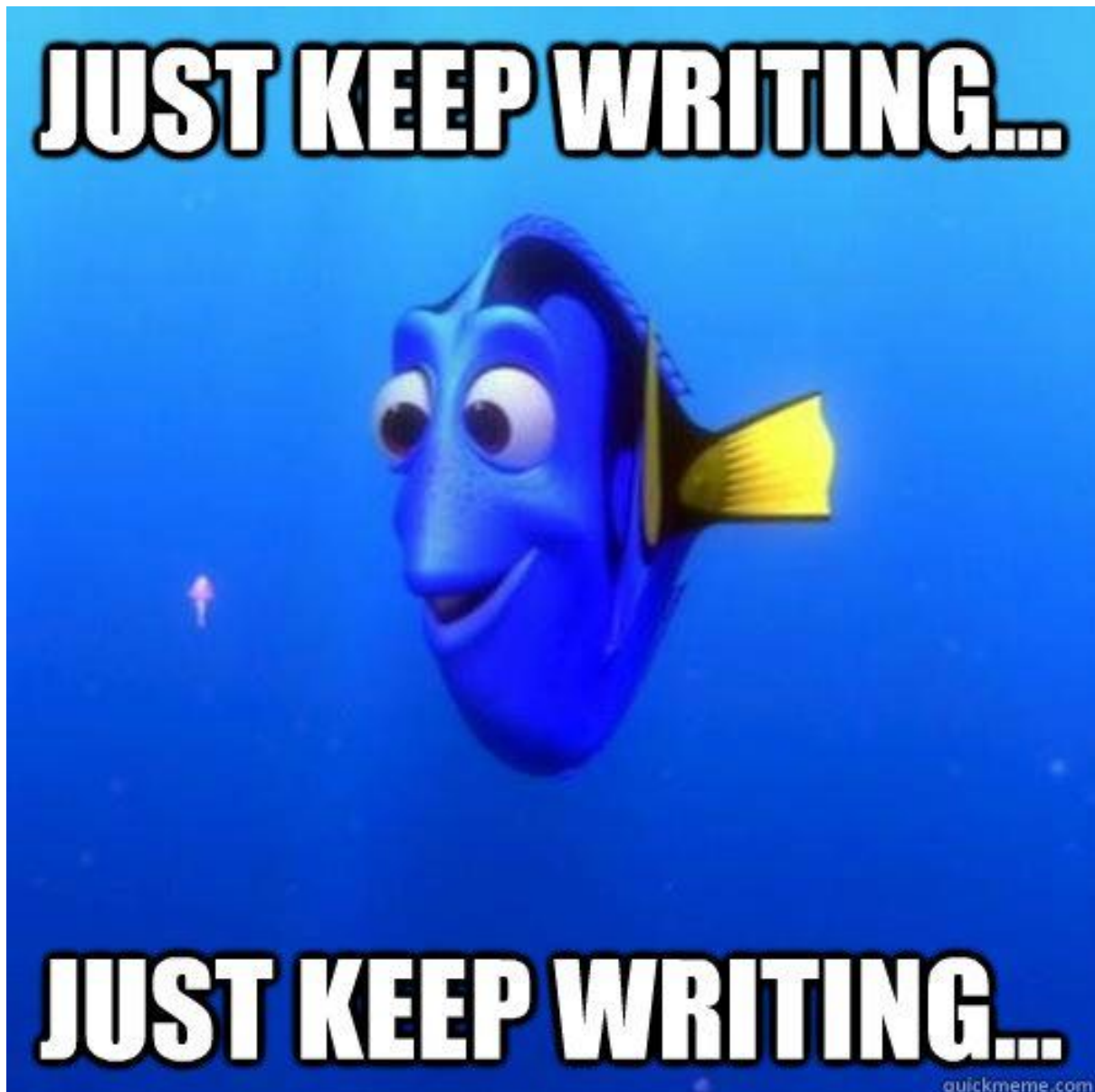


Figure 2.1: Clear proof of theorem.

As stated in the Decentralized Application (DAPP) theorem, I'm right.



# Chapter 3

## Geatest Common Divisor

Decentralized Application Ethereum Virtual Machine (EVM) Smart Contract (SC) Transaction  
Bitcoin Cryptocurrency Blockchains

# Appendix

# Bibliography

# Articles

- [1] A. Fakhry, “How i created the theory of relativity,” *Physics today*, **journal** 35, **number** 8, **pages** 45–47, 1982.

# Glossary

## Acronyms

AIC	Al-Azhar ICPC Community
DAPP	Decentralized Application
EVM	Ethereum Virtual Machine
SC	Smart Contract
TX	Transaction

## Terminology

bitcoin	A cryptocurrency that uses a blockchain network to regulate the generation of coins/tokens and transfer of funds. Bitcoin is the most widely used cryptocurrency and is the most widely traded currency in the world.
blockchain	A blockchain is a distributed database that is shared among the nodes of a computer network. As a database, a blockchain stores information electronically in digital format.
cryptocurrency	Digital money which uses encryption and consensus algorithms to regulate the generation of coins/tokens and transfer of funds. Cryptocurrencies are generally decentralized, operating independently of central authorities.

# List of Figures

2.1	Clear proof of theorem. . . . .	2
-----	---------------------------------	---

# Listings

# List of Tables