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# Masking the Real Code "CodeMask"

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## ABSTRACT

*The modern software industry faces numerous challenges that require innovative solutions to protect intellectual property and prevent abuse. The development of a project for masking real code is a key step towards ensuring the security of software products. This project offers modern obfuscation techniques that meet the dynamic requirements of developers, companies and customers, providing reliable protection and security of the code.*

*Keywords: code, security, obfuscation, encryption, protection.*

## INTRODUCTION

In our digitalized world, where technology is advancing at a rapid pace, the same applies to the development of software solutions that must meet new challenges in security and data protection. One of the main aspects of modern software engineering is the need to protect intellectual property and prevent unauthorized use of code. Masking the real code through obfuscation is becoming not only a preferred but also an important practice.

The development of a tool for masking program code will effectively make it difficult to decode and reveal its original logic. By using the most innovative security technologies, the application will offer a reliable solution for the security of software applications, while ensuring their functionality and performance. This makes it a key step towards strengthening the safety of software products in today's dynamic digital era.

## PURPOSE AND OVERVIEW OF THE PROBLEM AREA

The goal of the project is to develop and implement a tool for masking real code that will provide protection for software applications through innovative obfuscation technologies. Creating a modern and effective solution will help developers and organizations protect their intellectual property by making the code difficult to analyse and reverse engineer, without compromising its functionality and performance.

In the modern software industry, the challenges related to code security are numerous. The issues that the project aims to address include:

- Risk of unauthorized access to the code;
- Vulnerability to reverse engineering;
- Lack of effective protection tools;

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- Need for simplified and integrated solutions.

The development of a code masking application aims to solve these problems by providing a reliable, affordable, and innovative solution for protecting software projects that will meet the needs of the modern digital environment.

## MAIN STAGES OF CREATION

To develop an effective solution for masking the real code, it is necessary to first conduct a thorough analysis of the available information and current challenges. It is essential to review the already existing technologies, and obfuscation approaches to assess their effectiveness and applicability. After completing the design phase, the solutions should be summarized and documented to serve as a basis for the selection of technologies and implementation methods. With all the necessary resources in place, the project can proceed to the initial implementation.

The main stages in developing the obfuscation tool include [1]:

- Analysis of the source data;
- System design;
- Assessment of technical resources;
- Implementation of the tool;
- Additional testing and implementation.

## LOGICAL AND FUNCTIONAL SOLUTION

Any real code masking application aims to provide protection for software products by using effective obfuscation methods. For the successful implementation of such an application, it is necessary to consider key components and solutions that determine its effectiveness and functionality. The main elements of a well-structured code masking application are:

- Appearance;
- Functionality;
- Content;
- Ease of use.

Building the application architecture is a key stage in the development process. Architecture is the logical structure and organization that defines how the system functions and what value it provides to users. The main goal of architecture is to ensure reliability, efficiency, and ease of access, while creating a sense of completeness and integration.

The logical model of interaction between users and the system is visualized through use-case diagrams. They describe different aspects of the application's functionality and allow for a clear distinction of roles in the system [2].

## CHOOSING LANGUAGE AND DEVELOPMENT ENVIRONMENT

Using Python as the main programming language provides flexibility and efficiency in developing software to mask real code. Thanks to a rich set of libraries and frameworks, Python allows for quick and easy implementation of key obfuscation functionalities [3].

The open-source MySQL database management system is used, offering reliability and high performance. MySQL was chosen as the DBMS (database management system) due to its easy integration with Python and its broad support in the software ecosystem.

The development environment used to create the application is Visual Studio Code, which provides an intuitive interface and useful functionalities such as line numbering, code auto-completion, error detection and correction, syntax highlighting, and integrated testing tools.

By using these technologies and tools, the project aims to offer a modern and reliable solution for software code protection, combining high functionality with a user-friendly interface [4].

## APPLICATION DESCRIPTION

The application for masking the real code offers a combination of efficiency and convenience, providing a high level of security and privacy by hiding the original code. To provide various functions for code processing, ensuring protection through masking. The

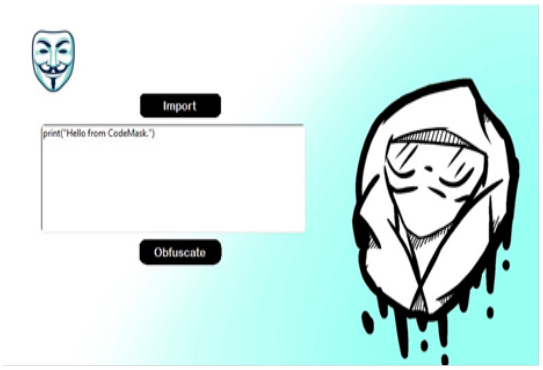


Fig. 1. „CodeMask”.

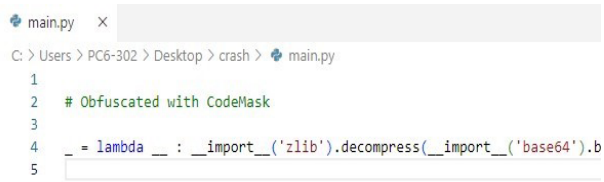


Fig. 2. Obfuscated code.

platform allows for safe code entry and editing, minimizing the risks of unauthorized access. By using advanced encryption and protection algorithms, the program ensures code security during each operation (Fig. 1).

Fig. 2 shows the encrypted code, which provides a high level of information protection. Once the code is attached to the “CodeMask”, it is automatically sent to Gemini AI, which recognizes whether it is written in Python. Upon successful recognition, the encryption process begins. After encryption is complete, the resulting result is displayed in the field where the original code was previously located.

Using powerful cryptographic algorithms, the application converts the original code into an unintelligible form, preventing unauthorized access and modification. Encrypted code can be stored and processed securely, with only authorized users with a valid key or access can decrypt and execute it. This ensures not only confidentiality, but also the integrity of the information, providing protection against external and internal threats. The code masking application provides a complete solution for managing the process of processing and protecting code, driving innovation in the way data is communicated and interacted with.

## CONCLUSIONS

The development and implementation of a software tool for masking real code represents a significant step towards ensuring security and protection in the modern software industry. The project responds to the growing need for innovative solutions for intellectual property

protection by providing an intelligent and effective platform for code obfuscation.

The creation and improvement of this tool represent a key stage in the fight against unauthorized access to software applications, while combining high functionality and user convenience. The project is of utmost importance for the modern digital era, where data and technology protection is a top priority. The tool provides developers with the necessary tools to protect their projects, adapting to dynamically changing challenges in the field of software security.

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