**ENGIENEERING METHOD PROYECT REPORT**

**Problem identification**

Ahora bien, la pequeña empresa para la que usted trabaja ha decidido tomarse en serio la seguridad de sus sistemas y realizar sus propias implementaciones de algunos algoritmos de encriptación. Para esto, una de las tareas más básicas que deben realizar (que por esto se la confiaron a su equipo de desarrolladores junior), es poder contar con un programa que permita la **generación de números primos** que posteriormente podrán ser utilizados por los algoritmos. Como es bien sabido, el proceso puede ser riguroso y dispendioso en tiempo, por tal su jefe le ha pedido implementar tres (3) algoritmos que cumplan con este propósito, para posteriormente seleccionar el mejor.

Since the company will improved its security system, cryptography will have a fundamental role in the process, since it is a very secure way to protect data.

In order to implement the cryptography-basedc security system, we need a program (implemented using different approaches) that generates (n) prime numbers (being ‘n’ the desired amount) and display them on the screen, arranged in a matrix.

Prime numbers are needed in order to implement effective encryption algorithms.

Specifications

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| --- | --- |
| Name | S1. Generate prime numbers. |
| Description | The program must be able to generate (n) prime numbers.  It must have three algorithms that can perform this task. |
| Inputs | Integer (n) that represents the maximum amount of prime numbers. |
| Outputs | A list of integers containing the first (n) prime numbers |

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| Name | S2. Get input |
| Description | The program must be able to receive the input from the user via a GUI.  This input has to be an integer (n) >0 and will be used to generate the prime numbers and create a matrix containing them in order to display them on the screen. |
| Inputs | An input (n) that represents the maximum amount of prime numbers that must be generated. |
| Outputs | <None> |

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| --- | --- |
| Name | S3. Generate Matrix. |
| Description | The program must generate a matrix containing all the integers from 0 to (n) where (n) is an input given by the user. |
| Inputs | Input (n) |
| Outputs | A matrix containing all the numbers from 0 to (n) |

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| --- | --- |
| Name | S4. Diferentiate primes. |
| Description | The program must |
| Inputs | Input (n) |
| Outputs | A matrix containing all the numbers from 0 to (n) |

**Relevant information compilation**

A prime number is a whole number greater than 1 whose only factors are 1 and itself. A factor is a whole number that can be divided evenly into another number. Numbers that have more than two factors are called composite numbers. The number 1 is neither prime nor composite.

Prime numbers and cryptography

Encryption always follows a fundamental rule: the algorithm -- or the actual procedure being used -- doesn't need to be kept secret, but the key does. Even the most sophisticated hacker in the world will be unable to decrypt data as long as the key remains secret -- and prime numbers are very useful for creating keys. For example, the strength of public/private key encryption lies in the fact that it's easy to calculate the product of two randomly chosen prime numbers, but it can be very difficult and time consuming to determine which two prime numbers were used to create an extremely large product, when only the product is known. This problem is called prime factorization and finding an algorithm which does it fast is one of the unsolved problems of computer science.

Recursos

<https://whatis.techtarget.com/definition/prime-number>

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