A picture containing application

Description automatically generated

Faculty of Computer Science and Artificial Intelligence at Cairo University

Course Name: Structured Programming 1

Course Number: CS112

Dr. Mohamed El-Ramly

Assignment: 2

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| Name | ID | E-Mail |
| Mohamed Hussein Hassan | 20210335 | mohamed.h.eladwy@gmail.com |
| Youssef Hammed Mohamed | 20210494 | youssefh472003@gmail.com |
| Alialdin Muhammad Mostafa | 20210251 | alialdin.mohamad@gmail.com |

Algorithm of Task 3, cipher number 5 (**Simple Substitution Cipher**):

1. Define a counter = 0, to count the number of times that the user used the program
2. Define 3 Variables (message, choose, key) to use.
3. Make the user gets method of the 3 methods from (1- cipher, 2-decipher, 3- both, 4- exit) to do.
4. If the options not equal to 4 then the program will do
5. Get the key from the user.
6. then make the encryption that depends on the key given from the user.
7. Then get the message from the user.
8. If the method that the user choose is “Cipher”, then the message will be encrypted then print the encryption message.
9. If the method that the user choose is “Decipher”, then the message will be decrypted then print the decrypted message.
10. If “both”, then we will do (d and e) together
11. After the progress be done, we will as the user if he wants to use the program again
12. If yes, we will call the program function again and increase the counter by 1
13. If not, will close the program.

Algorithm of the Problem Number 14 in book, Task 4:

1. We will ask the user to enter the time as (hh:mm:ss) format.
2. Then we will check the input
3. If the input is matching with the format.
4. We will split the input to hours, minutes, and seconds.
5. Then check the limit of the numbers that he entered.
6. If the numbers are inclusive the interval
7. We will calculate the total number of seconds then print it.
8. If the numbers are out of the intervals then we will ask him again to enter the time in the following formatting (hh:mm:ss).
9. If the input doesn’t match the format, then we will ask the user to enter the input again.

Algorithm of the Rational Number Calculator:

1. Print the Instructions of the calculator
2. Get the input from the user
3. If the input equal ‘exit’, then the program will close.
4. If the input is an operation, then we will split the input to number\_1, operator, and number\_2
5. Check the validation if the three parts of our input
6. If all correct, we will split every number to nominator and denominator then calculate the number itself, then calculate the hole operation which is (number\_1 operator number\_2), then print the result as rational number (nominator/denominator).
7. If the input is invalid then we will ask the user to enter the input again.