## 1.Pseudocode of the Euclidean Algorithm

Algorithm: Euclidean Algorithm

Input: Two integers, a and b

Output: The greatest common divisor of a and b

1. While b ≠ 0

1.1. Set temp to b

1.2. Set b to a modulo b

1.3. Set a to temp

2. Return a

## 2. Implementation of the Euclidean Algorithm

def euclidean\_algorithm(a, b):

"""

Calculate the greatest common divisor of two integers using the Euclidean Algorithm.

:param a: First positive integer

:param b: Second positive integer

:return: The greatest common divisor of a and b

"""

while b != 0:

temp = b

b = a % b

a = temp

return a

## 3. Create a git repository and commit

git add .

git commit -m "Initial commit: Added Euclidean Algorithm implementation"

git branch -M main

git remote add origin <https://github.com/sanwei123/FC723-Assignment3.git>

git push -u origin main

## 4. Refactor code

def get\_positive\_integer(prompt):  
 *"""  
 Get a positive integer from the user.  
  
 :param prompt: The prompt to display to the user  
 :return: A positive integer input by the user  
 """* while True:  
 try:  
 number = int(input(prompt))  
 if number > 0:  
 return number  
 else:  
 print("Please enter a positive integer.")  
 except ValueError:  
 print("Invalid input. Please enter a positive integer.")  
  
def main():  
 a = get\_positive\_integer("Enter the first positive integer: ")  
 b = get\_positive\_integer("Enter the second positive integer: ")  
 gcd = euclidean\_algorithm(a, b)  
 print(f"The greatest common divisor of {a} and {b} is {gcd}.")  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 main()

## 5. Commit the new version

git add .

git commit -m "Added user input and validation for the Euclidean Algorithm"

git log

commit 01f1c766858b758159a7f210b9df5238c267f0a7 (HEAD -> main)

Author: sanwei123 <alwayszws@outlook.com>

Date: Sun Apr 14 20:32:51 2024 +0800

Added user input and validation for the Euclidean Algorithm

commit 1652fc41cae9526c408ad839e6d0e13d4c5ca7a6 (origin/main)

Author: sanwei123 <alwayszws@outlook.com>

Date: Sun Apr 14 20:18:46 2024 +0800

Initial commit: Added Euclidean Algorithm implementation

git diff

git push -u origin main

Github link: https://github.com/sanwei123/FC723-Assignment3

## 6. extension to the Euclidean Algorithm

Algorithm: Compute LCM using Euclidean Algorithm

Input: Two integers, a and b

Output: The least common multiple of a and b

1. Calculate GCD of a and b using the Euclidean Algorithm

2. Calculate LCM using the formula lcm = (a \* b) / gcd

3. Return lcm