南京信息工程大学 实验（实习）报告

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| --- | --- | --- | --- | --- | --- |
| 日期 |  | 得分 |  | 指导教师 |  |
| 班级 |  | 学号 |  | 姓名 |  |

扩展欧几里得算法

1．实验目的：

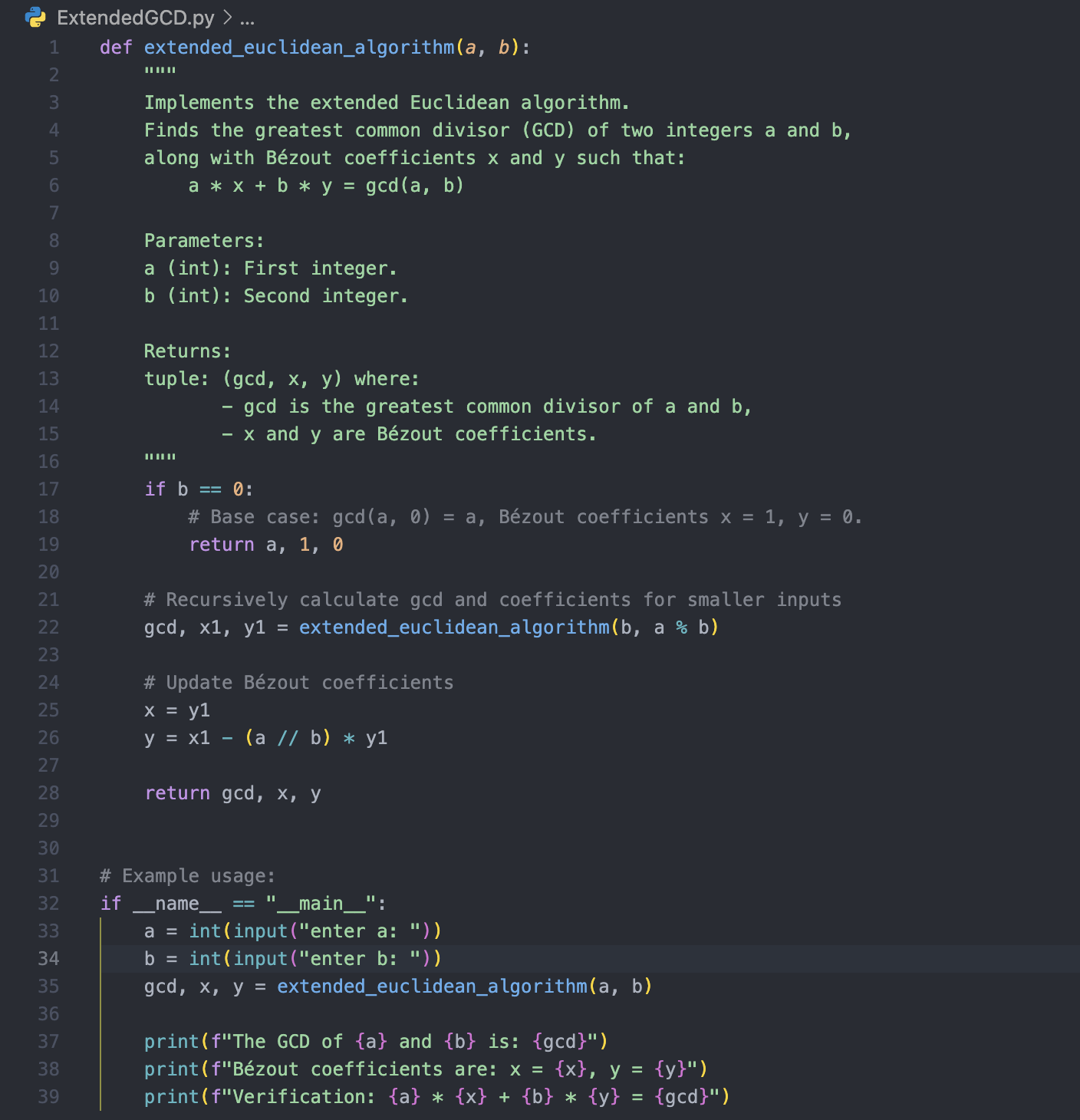
1. 理解扩展欧几里得算法；
2. 实现扩展欧几里得算法并进行验证。

2．实验内容：

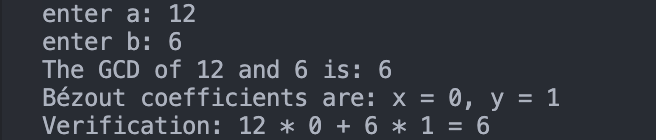
1. 实现扩展欧几里得算法；
2. 运行多个例子，验证两个数互素和不互素的情况。

3．Experiment Steps

3.1 Code（Python implementation）：



3.2 Program outcome：



3.3 Program Introduction: Extended Euclidean Algorithm

This program implements the Extended Euclidean Algorithm, which calculates the greatest common divisor of two positive integers and , and finds the coefficients and that satisfy Bézout’s identity.

Bézout’s Identity:

Program Features:

1. Input:

The user enters two positive integers and .

2. Output:

• The greatest common divisor  of the two numbers.

• A unique solution(X, Y) that satisfies .

3. Verification:

• The program verifies that the results satisfy Bézout’s identity to ensure the correctness of the output.

4.