# TDT4205 Compiler Construction

## Assignment 4

### 1. Theory

1.1.1) Three Access Code:

```
main:
t1 = 1144
t2 = 546
param t1
param t2
k = call gcd
return
```

} Assume t1 = a, t2 = b. So params are pushed in the order they are used in the function.

```
gcd:
if t2 > 0 then goto (L1)
g = t1
goto (L2)
L1:
t3 = t1 / t2
t4 = t2 · t3
t5 = t1 - t4
param t2
param t5
g = call gcd
L2:
return g
```
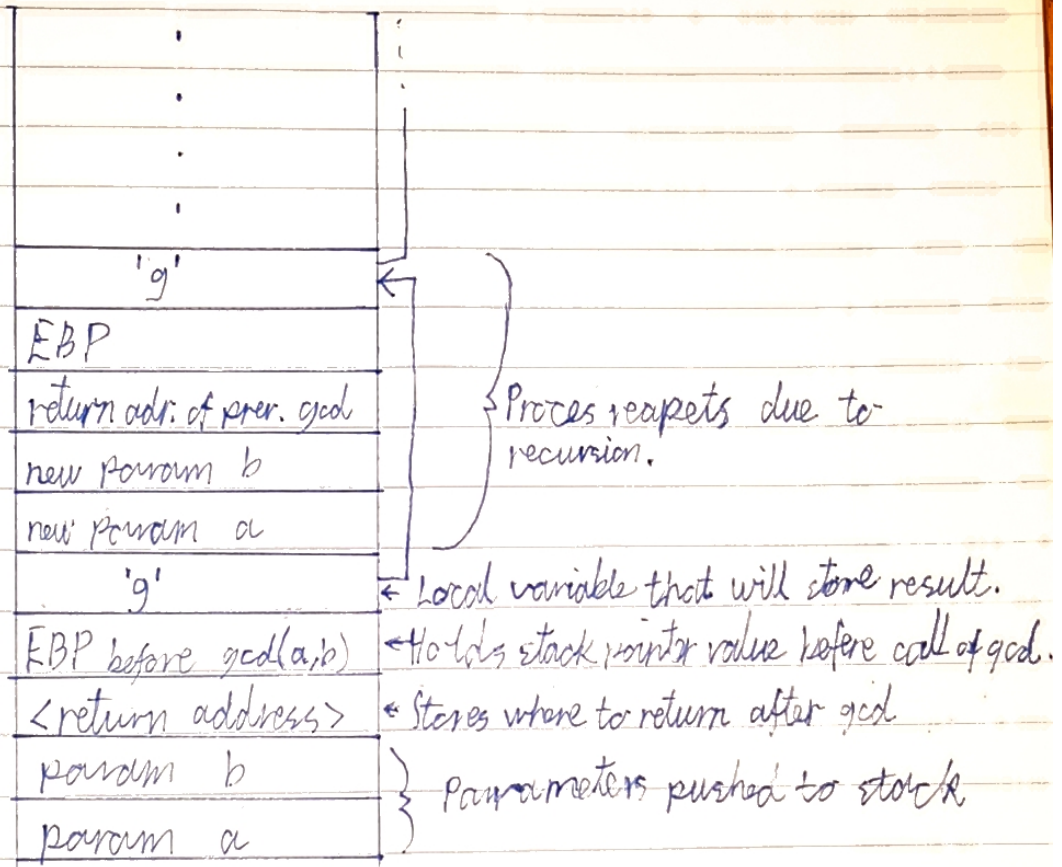
## 1.1.2) Stack machine

| | |
|---|---|
| ⋮ | |
| 'g' | |
| EBP | |
| return adr. of prev. gcd | } Proces reapets due to recursion. |
| new param b | |
| new param a | |
| 'g' | ← Local variable that will store result. |
| EBP before gcd(a,b) | ← Holds stack pointer value before call of gcd. |
| \<return address\> | ← Stores where to return after gcd |
| param b | } Parameters pushed to stack |
| param a | |

## 1.1.3) Recursion finished and ready to return.

| | | |
|---|---|---|
| ESP ⟶ | 'g' = 26 | ← gcd(1144,546)=26 |
| EBP ⟶ | EBP before first gcd | |
| | \<return address\> | |
| | 546 | |
| | 1144 | |