SWT WS 2020/21
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Aufgabenblatt 4

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Aufgabe 6.1

a) Java

```java
public class GcdCalculator {

    public static void main(String[] args) {
        //Tests
        GcdCalculator test = new GcdCalculator();
        System.out.println(test.gcd(12,18));
        System.out.println(test.gcd(16,20));
        System.out.println(test.gcd(120,900));
        System.out.println(test.gcd(105,26));
    }

    //Code
    public int gcd(int a, int b) {
        if (a == 0) { return Math.abs(b); }
        if (b == 0) { return Math.abs(a); }
        while (b != 0) {
            int h = a % b;
            a = b;
            b = h;
        }
        return Math.abs(a);
    }
}

```

b) C

```c
#include <stdio.h>
#include <stdlib.h>

int gcd(int a, int b);

int main() {
    //Tests
    printf("%d\n", gcd(12, 18));
    printf("%d\n", gcd(16, 20));
    printf("%d\n", gcd(120, 900));
    printf("%d\n", gcd(105, 26));

    return 0;
}

//Code
int gcd(int a, int b) {
    if (a == 0) { return abs(b); }
    if (b == 0) { return abs(a); }
    while (b != 0) {
        int h = a % b;
        a = b;
        b = h;
    }
    return abs(a);
}

```

c) Python

```python
#Code
def gcd(a, b):
    if a==0:
        return abs(b)
    if b==0:
        return abs(a)
    while b!=0:
        h = a % b
        a = b
        b = h
    return abs(a)

#Tests
print(gcd(12,18))
print(gcd(16,20))
print(gcd(120,900))
print(gcd(105,26))

```

d) JavaScript

```javascript
//Code
function gcd(a, b) {
  if (a==0) {
    return Math.abs(b);
  }
  if (b==0) {
    return Math.abs(a)
  }
  while (b!=0){
    var h = a % b;
    a = b;
    b = h;
  }
  return Math.abs(a)
}

//Tests
console.log(gcd(12,18))
console.log(gcd(16,20))
console.log(gcd(120,900))
console.log(gcd(105,26))

```

e) Go

```go
package main

import "fmt"

func main() {
    //Tests
    fmt.Println(gcd(12,18))
    fmt.Println(gcd(16,20))
    fmt.Println(gcd(120,900))
    fmt.Println(gcd(105,26))
}

//Code
func gcd(a, b int) int {
    if a==0 {
        return Abs(b)
    }
    if b==0 {
        return Abs(a)
    }
    for {
        if b==0 {
            h := a % b
            a = b
            b = h
        }
    }
    return Abs(a)
}

//Auxiliary function
func Abs(x int) int {
    if x < 0 {
      return -x
    }
    return x
}

```

f) Kotlin

```kotlin
import kotlin.math.abs

fun main() {
    //Tests
    println("${gcd(12,18)}")
    println("${gcd(16,20)}")
    println("${gcd(120,900)}")
    println("${gcd(105,26)}")
}

//Code
fun gcd(a: Int, b: Int): Int {
    var v1 = a
    var v2 = b
    if (a==0) {
        return abs(b)
    }
    if (b==0) {
        return abs(a)
```

```
20      }
21      while (v2!=0){
22          var h: Int = v1 % v2
23          v1 = v2
24          v2 = h
25      }
26      return abs(v1)
27  }
28
```

Aufgabe 6.2