Aufgabenblatt 4

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Aufgabe 6.1

a)

```
public class GcdCalculator {
2
3
      public static void main(String[] args) {
4
          //standard tests
5
          GcdCalculator test = new GcdCalculator();
6
          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));
9
10
11
      public int gcd(int a, int b) {
12
           if (a == 0) { return Math.abs(b); }
13
           if (b == 0) { return Math.abs(a); }
14
           while (b != 0) {
              int h = a % b;
17
               a = b;
18
               b = h;
           }
19
           return Math.abs(a);
20
      }
21
22 }
```

b)

```
#include <stdio.h>
  #include <stdlib.h>
4 int gcd(int a, int b);
6 int main() {
      printf("%d\n", gcd(12, 18));
      printf("%d\n", gcd(16, 20));
      printf("%d\n", gcd(120, 900));
9
      printf("%d\n", gcd(105, 26));
10
11
12
      return 0;
13 }
14
int gcd(int a, int b) {
      if (a == 0) { return abs(b); }
16
      if (b == 0) { return abs(a); }
17
      while (b != 0) {
18
           int h = a \% b;
19
           a = b;
20
           b = h;
21
      }
22
23
      return abs(a);
24 }
25
```

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c)

```
def gcd(a, b):
      if a==0:
2
          return abs(b)
3
      if b==0:
4
          return abs(a)
5
      while b!=0:
6
         h = a \% b
          a = b
          b = h
9
      return abs(a)
10
11
print(gcd(12,18))
13 print (gcd (16,20))
14 print (gcd (120,900))
15 print (gcd (105,26))
16
```

d)

```
function gcd(a, b) {
    if (a==0) {
2
      return Math.abs(b);
3
4
    if (b==0) {
5
      return Math.abs(a)
6
    while (b!=0) {
     var h = a \% b;
10
      a = b;
      b = h;
11
12
    return Math.abs(a)
13
14 }
15
16 console.log(gcd(12,18))
17 console.log(gcd(16,20))
18 console. log(gcd(120,900))
19
  console. log(gcd(105, 26))
```

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e)

```
package main
3 import "fmt"
5 func main() {
   fmt.Println(gcd(12,18))
   fmt.Println(gcd(16,20))
    fmt.Println(gcd(120,900))
    fmt.Println(gcd(105,26))
9
10 }
11
12 func gcd(a, b int) int {
    if a==0 {
13
      return Abs(b)
14
15
    if b==0 {
16
17
      return Abs(a)
18
    for {
19
     if b==0 {
20
       h := a % b
21
        a = b
22
23
        b = h
      }
24
    }
25
    return Abs(a)
26
27 }
28
29 func Abs(x int) int {
   if x < 0 {
30
31
     return -x
32
33
    return x
34 }
35
```

f)

```
import kotlin.math.abs
3 fun main() {
      println("${gcd(12,18)}")
      println("${gcd(16,20)}")
      println("${gcd(120,900)}")
6
      println("${gcd(105,26)}")
  }
8
10 fun gcd(a: Int, b: Int): Int {
11
      var v1 = a
      var v2 = b
13
      if (a==0) {
          return abs(b)
14
      }
15
      if (b==0) {
16
          return abs(a)
17
18
19
      while (v2!=0){
20
          var h: Int = v1 \% v2
21
           v1 = v2
           v2 = h
```

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```
23 }
24 return abs(v1)
25 }
26
```

Aufgabe 6.2