Aufgabenblatt 4

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Aufgabe 6.1

a) Java

```
public class GcdCalculator {
2
3
      public static void main(String[] args) {
4
          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));
8
           System.out.println(test.gcd(105,26));
9
      }
10
11
      //Code
12
      public int gcd(int a, int b) {
13
          if (a == 0) { return Math.abs(b); }
14
           if (b == 0) { return Math.abs(a); }
           while (b != 0) {
17
               int h = a % b;
18
               a = b;
               b = h;
19
           }
20
           return Math.abs(a);
21
22
      }
23
24
```

b) C

```
#include <stdio.h>
  #include <stdlib.h>
2
4 int gcd(int a, int b);
6 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));
11
12
13
      return 0;
14 }
15
16 //Code
17
  int gcd(int a, int b) {
      if (a == 0) { return abs(b); }
18
       if (b == 0) { return abs(a); }
19
       while (b != 0) {
20
          int h = a % b;
21
22
           a = b;
           b = h;
23
      }
24
      return abs(a);
25
26 }
27
```

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c) Python

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

d) JavaScript

```
1 //Code
g function gcd(a, b) {
    if (a==0) {
3
      return Math.abs(b);
4
5
6
    if (b==0) {
     return Math.abs(a)
    while (b!=0) {
9
     var h = a \% b;
10
      a = b;
11
      b = h;
12
13
    return Math.abs(a)
14
15 }
16
17 //Tests
18 console. log(gcd(12,18))
19 console. log(gcd(16,20))
20 console. log(gcd(120,900))
  console.log(gcd(105,26))
```

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e) Go

```
1 package main
  import "fmt"
3
5 func main() {
     //Tests
      fmt.Println(gcd(12,18))
      fmt.Println(gcd(16,20))
      fmt.Println(gcd(120,900))
9
      fmt.Println(gcd(105,26))
10
11 }
12
  //Code
13
  func gcd(a, b int) int {
14
      if a==0 {
15
           return Abs(b)
16
17
       if b==0 {
18
           return Abs(a)
19
      }
20
      for {
21
           if b==0 {
22
               h := a % b
23
               a = b
24
               b = h
25
           }
26
27
      }
28
       return Abs(a)
29 }
30
  //Auxiliary function
31
32 func Abs(x int) int {
      if x < 0 {
33
        return -x
34
35
36
      return x
37
```

f) Kotlin

```
import kotlin.math.abs
3 fun main() {
     //Tests
4
      println("${gcd(12,18)}")
5
      println("${gcd(16,20)}")
6
      println("${gcd(120,900)}")
      println("${gcd(105,26)}")
9
  }
10
11 //Code
12 fun gcd(a: Int, b: Int): Int {
      var v1 = a
13
      var v2 = b
14
      if (a==0) {
          return abs(b)
16
17
      if (b==0) {
18
          return abs(a)
```

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

Aufgabe 6.2