Tasks for fMRI-Setting (Tasks of first and second pilot study at the end)

1. Faculty

```
public static void main(String[] args) {
	int result = 1;
	int x = 4;

	while (x > 1) {
		result = result * x;
		x--;
	}
	System.out.println(result);
}
```

7. Find max in list of numbers

```
public static void main (String[] args) {
	int array[] = {2, 19, 5, 17};
	int result = array[0];
	for (int i = 1; i < array.length; i++)
	    if (array[i] > result)
		result = array[i];
	System.out.println(result);
}
```

8. Cross sum

```
public static void main(String[] args) {
	int number = 323;
	int result = 0;

	while (number!= 0) {
		result = result + number % 10;
		number = number / 10;
	}
	System.out.println(result);
}
```

9. Prime test

```
public static void main(String[] args){
	int number = 11;
	boolean result = true;
	for(int i = 2; i < number; i++) {
		if(number % i == 0) {
			result = false;
			break;
		 }
	}
	System.out.println(result);
}
```

10. Find middle number of three numbers

```
public static void main(String[] args) {
	int num1 = 5;
	int num2 = 3;
	int num3 = 10;

	if (num1 > num2 && num1 > num3)
		System.out.println(num1);
	else if (num2 > num1 && num2 > num3)
		System.out.println(num2);
	else if (num3 > num1 && num3 > num2)
		System.out.println(num3);
}
```

11. Power

```
public static void main(String[] args) {
	int num1 = 2;
	int num2 = 3;
	int result = num1;
	for (int i = 1; i < num2; i++) {
		result = result * num1;
	}
	System.out.println(result);
}
```

13. Swap

```
public static void main(String[] args) {
	int var1 = 23;
	int var2 = 42;
	int temp;
	temp = var1;
	var1 = var2;
	var2 = temp;
	System.out.println(var1);
}
```

14. Reverse string

```
public static void main(String[] args) {
	String word = “Hello”;
	String result = new String();

	for ( int j = word.length() - 1; j >= 0; j-- )
		result += word.charAt(j);

	System.out.println(word);
}
```

17. Check whether substring is contained

```
public static void main(String[] args)  {
```

```
        String word = "Programming in Java";
        String key1 = "Java";
        String key2 = "Pascal";

        int index1 = word.indexOf(key1);
        int index2 = word.indexOf(key2);

        if (index1 != -1)
            System.out.println("Substring is contained: " + key1);
        else
            System.out.println("Substring is not contained: " + key1);

        if (index2 != -1)
            System.out.println("Substring is contained: " + key2);
        else
            System.out.println("Substring is not contained: " + key2);
}
```

20. Decimal to binary

```
public static void main(String[] args) {
        int i=14;
        String result="";

        while (i>0) {
               if (i%2 ==0)
                      result="0"+result;
               else
                      result="1"+result;
               i=i/2;
        }

        System.out.println(result); }
```

21. Reverse entries of array

```
public static void main(String[] args) {
       int[] array = { 1, 6, 4, 10, 2 };

       for (int i = 0; i <= array.length/2-1; i++){
              int tmp=array[array.length-i-1];
              array[array.length-i-1] = array[i];
              array[i]=tmp;
       }

       for (int i = 0; i <= array.length - 1; i++)
              System.out.println(array[i]);
       }
}
```

22. Median on sorted data

```
public static void main(String[] args) {
        int[] array={1,2,4,5,6,10};

        array.sort(aufsteigend);

        float b;
        if (array.length % 2==1)
```

```
            b=array[array.length /2];
        else
            b=(array[array.length/2-1]+array[array.length/2])/2f;


        System.out.println(b);
}
```

First and second pilot study

2. Count same chars at same positions in String

```
public static void main(String[] args) {
      String string1 = “Magdeburg”;
      String string2 = “Hamburg”;

      int length;
      if (string1.length() < string2.length())
            length = string1.length();
      else length = string2.length();

      int counter=0;

      for (int i = 0; i < length; i++) {
            if (string1.charAt(i) == string2.charAt(i)) {
                  counter++;
            }
      }
      System.out.println(counter);
}
```

6. Sum from 1 to n

```
public static void main (String[] args) {
      int n = 4
      int result = 0;
      for (int i = 1; i <= n; i++)
          result = result + i;
      System.out.println(result);
}
```

12. Check palindrom

```
public static void main(String[] args) {
      String word = "otto";
      boolean result = true;
      for (int i = 0, int j = word.length() - 1; i < word.length()/2; i++,
            j--) {
            if (word.charAt(i) != word.charAt(j)) {
                  result = false;
                  break;
            }
      }
      System.out.println(result);
}
```

23. Double entries of array

```
public static void main(String[] args) {
```

```
	int[] array = { 1, 3, 11, 7, 4 };

	for (int i = 0; i < array.length; i++)
		array[i] = array[i] * 2;

	for (int i = 0; i <= array.length - 1; i++)
		System.out.println(array[i]);
}
```

Only in the first pilot study

3. Greatest common divisor

```
public static void main(String[] args) {
   int temp
   do {
      if (number1 < number2) {
         temp = number1;
         number1 = number2;
         number2 = temp;
      }
      temp = number1 % number2;
      if (temp != 0) {
          number1 = number2;
          number2 = temp;
      }
    } while (temp != 0);
    System.out.println(number2);
}
```

4. BubbleSort

```
public static void main(String[] args) {
	int array[] = {14,5,7};
	for (int counter1 = 0; counter1 < array.length; counter1++) {
		for (int counter2 = counter1; counter2 > 0; counter2--) {
			if (array[counter2 - 1] > array[counter2]) {
				int variable1 = array[counter2];
				array[counter2] = array[counter2 - 1];
				array[counter2 - 1] = variable1;
			}
		}
	}

	for (int counter3 = 0; counter3 < array.length; counter3++)
		System.out.println(array[counter3]);
}
```

5. Binary search

```
public static void main(String[] args) {
	int array[] = { 2, 4, 5, 6, 8, 10, 13 };
	int key = 5;
	int index1 = 0;
```

```
	int index2 = array.length - 1;
	while (index1 <= index2) {
		int m = (index1 + index2) / 2;
		if (key < array[m])
			index2 = m - 1;
		else if (key > array[m])
			index1 = m + 1;
		else {
			System.out.println(m);
			break;
		}
	}
}
```

15. Matrix multiplication

```
public static void main(String[] args)  {
	int array[][] = {{5,6,7},{4,8,9}};
	int array1[][] = {{6,4},{5,7},{1,1}};
	int array2[][] = new int[3][3];

	int x = array.length;
	int y = array1.length;

	for(int i = 0; i < x; i++) {
		for(int j = 0; j < y-1; j++) {
			for(int k = 0; k < y; k++){
				array2[i][j] += array[i][k]*array1[k][j];
			}
		}
	}

	for(int i = 0; i < x; i++) {
		for(int j = 0; j < y-1; j++) {
			System.out.print(" "+array2[i][j]);
		}
	}
}
```

16. Arithmetic mean

```
public static void main(String[] args)  {
	int a = 4;
	int b = 8;
	int result = (a + b) / 2;
	System.out.println(result);
}
```

18. Least common multiple

```
public static void main(String[] args)  {
	int number1 = 23;
	int number2 = 42;

	int max, min;
	int results = -1

	if (number1>number2) {
```

```
            max = number1; min = number2;
      } else {
            max = number2; min = number1;
      }
      for(int i=1; i<=min; i++) {
            if( (max*i)%min == 0 ) {
                  result = i*max; break;
            }
      }
      if(result != -1)
            System.out.println(results);
      else
            System.out.println(“Error!”);
}
```

19. Capitalize first letter of word

```
public static void main(String[] args)  {
      String s = "here are a bunch of words";

      final StringBuilder result = new StringBuilder(s.length());

      String[] words = s.split("\\s");
      for(int i=0,l=words.length;i<l;++i) {
            if(i>0) result.append(" ");
            result.append(Character.toUpperCase(words[i].charAt(0)))
                  .append(words[i].substring(1);
      }
      System.out.println(result);
}
```