

Assignment 1

- Write heapsort
 - a method that takes an array of ints and sorts it by heapsort
 - overview of heapsort
 - sorting using a heap
 - heap – binary tree where each node has smaller value than its children
 - heap is constructed directly in the array
 - children of the node i are $2*i+1$ and $2*i+2$

```
void heapSort(int[] a) {  
    heapify(a, a.length);  
    end = a.length - 1;  
    while (end > 0) {  
        swap(a[end], a[0]);  
        siftDown(a, 0, end-1);  
        end--;  
    }  
}
```

Assignment 2

- Write quicksort
- Compare speed of both algorithms
 - create a big array and fill it with random data

```
java.util.Random r = new Random()  
x = r.nextInt();
```

- calculate necessary time

```
long before = System.nanoTime();  
...measured part...  
long after = System.nanoTime();  
long dobaBehuNanos = after - before;
```

Assignment 3 – for fast ones

- Create a hash table
 - write the class MyHashTable, which serves as a hash table
 - keys String
 - values Object
 - methods at least
 - Object get(String key)
 - void set(String key, Object value)
 - iterator over keys
 - variant for the „brave ones“ – create the hash table as a generic type (i.e. keys and values are generic)
 - create a program that counts number of words in a given file

Tests...

Test 1

- What is printed out

```
public interface Test {  
  
    public static void main(String[] argv) {  
        System.out.println("Hello");  
    }  
}
```

- A Cannot be compiled, the compiler prints out a message about bad syntax
- B Can be compiled but not executed, since main cannot be in an interface
- C Can be compiled and prints out Hello, since static methods can be in interfaces

Test 2



EXAM TEST

- What is printed out

```
public enum Test {  
    RED, GREEN, BLUE;  
  
    public static void main(String[] argv) {  
        System.out.println("Hello");  
    }  
}
```

- A Cannot be compiled, the compiler prints out a message about bad syntax
- B Can be compiled but not executed, since main cannot be in an enum
- C Can be compiled and prints out Hello



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