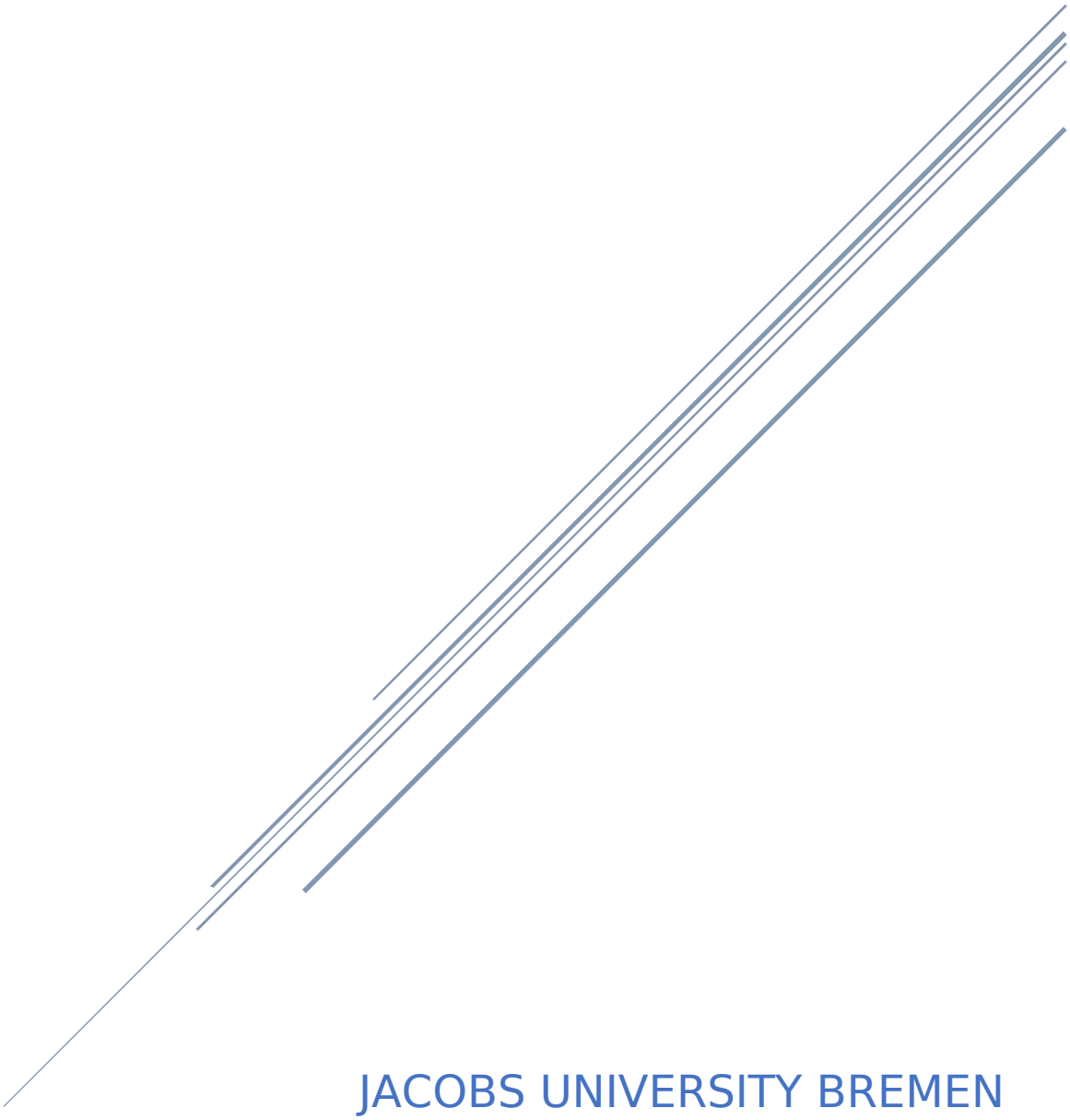
# HOMEWORK 10

## ALGORITHMS AND DATA STRUCTURES



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**Problem 10.1 Hash Tables**

**a)**

given the sequence <3,10,2,4> ,

First we create or hash table size m = 5

| | |
|---|---|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |

we are going to use the double hashing probing strategy using the following hashing functions $h1(k)=k \bmod 5$ and $h2(k)=7-k \bmod 8$ giving us a final formula of $h(k,i)=(k \bmod 5+i(7-k \bmod 8)) \bmod 5$ , we insert the first element 3.

h(3,0)=(3mod5)mod5 = 3

since position 3 is free we insert it element 3 in position 3

| | |
|---|---|
| 0 | |
| 1 | |
| 2 | |
| 3 | 3 |
| 4 | |

element 10.

h(10,0)=(10mod5)mod5 = 0

since position 0 is free we insert it element 10 in position 0

| | |
|---|---|
| 0 | 10 |
| 1 | |
| 2 | |
| 3 | 3 |
| 4 | |

element 2.

h(2,0)=(2mod5)mod5 = 2

since position 2 is free we insert it element 2 in position 2

| | |
|---|---|
| 0 | 10 |
| 1 | |
| 2 | 2 |
| 3 | 3 |
| 4 | |

element 4.

h(4,0)=(4mod5)mod5 = 4

since position 4 is free we insert it element 4 in position 4

| | |
|---|---|
| 0 | 10 |
| 1 | |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |

The program will have finish and luckily there were no collitions.