

1a)

In Question 1 / q1a.cpp.

IU^B

International
University
Bremen

The hash function $(k \% 5)$

was initially used, if no collision occurred,

so for 3 (which ended in 3rd position) →

10 (which ended up in 0th position),

2 (which ended up in 2nd position).

4 would have ended up in the 4th position which did not exist, so the other function

$index2 = 7k \% 8$ was

a position, a while loop was used to find n-index.
To find $n-index = (index * i + index2) \text{ MOD } (5-1)$

Initially $i = 1$ and n-index for 4 was 3rd pos

which was taken

~~So, $i = 2$, n-index~~

$i = 2$, n-index = 2 was, 2nd position was taken, so.

$i = 3$, n-index = 1 which was free

hence 4 was placed in the 1st position & that is how the collision was dealt with.

b) In question1/q1b.cpp.

2a) Consider the following set:

$$S = \{ (\text{item}_1, 2, 5), (\text{item}_2, 0, 4), (\text{item}_3, 4, 10) \}$$

If we use the shortest duration, then,

$$S' = \{ (\text{item}_1, 2, 5) \}$$

Whereas, the global optimal is:

$$S' = \{ (\text{item}_2, 0, 4), (\text{item}_3, 4, 10) \}$$

b) In Question2/q2b.cpp.