**Documentation – Statistical part**

Checking if a seat will be occupied or free depends on the actual time a request is entered and on the previous seven days. The code is implemented in Python with use of the mysql.connector and datetime.

A request is made by calling the function *check\_occupied(req\_room\_id, req\_seat\_id)*. This arguments passed are the requested room id and and the request seat id for the room. In this function the actual hour of the request is extracted in 24h format. Now a range to check for is generated, depending on the actual time. The range includes the actual hour and the two previous hours.

After a connection to the MySQL-Database has been established, the SQL-Query is filled the requested room and seat id. The query will look like:   
  
*SELECT times, occupied FROM history WHERE seat\_id=1 AND room\_id=1 ORDER by room\_id DESC;*

As a result the query returns all timestamps and occupied values (0 if not occupied, 1 if occupied) for this seat in the room stored in history-table. These results (about 10080 entries per unique seat) will now each checked if its hour from the timestamp is in the previous defined range. If true, the occupied value will be added to an overall score and a counter will be incremented. As soon as all entries are checked the overall-value will be divided through the counter to get the ratio of occupied entries to total entries for this unique seat in the chosen range. If this score is greater than 0.5 we assume a seat is occupied, otherwise it is free (under the assumption, that a person is regular studying at his favorite seat for a longer period of time). The result will be returned as a String value