

Back-end Tech Challenge

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Language	Java 8
Framework	Spring Boot
Database	H2 Database (In-Memory)
Build tool	Maven
Github link	https://github.com/MoMoZin/RestfulAPI-Spring.git

An underwater volcano formed a new small island in the Pacific Ocean last month. All the conditions on the island seems perfect and it was decided to open it up for the general public to experience the pristine uncharted territory.

The island is big enough to host a single campsite so everybody is very excited to visit. In order to regulate the number of people on the island, it was decided to come up with an online web application to manage the reservations. You are responsible for design and development of a REST API service that will manage the campsite reservations.

To streamline the reservations a few constraints need to be in place -

- The campsite will be free for all.
- The campsite can be reserved for max 3 days.
- The campsite can be reserved minimum 1 day(s) ahead of arrival and up to 1 month in advance.
- Reservations can be cancelled anytime.
- For sake of simplicity assume the check-in & check-out time is 12:00 AM

System Requirements

- The users will need to find out when the campsite is available. So the system should expose an API to provide information of the availability of the campsite for a given date range with the default being 1 month.
- Provide an end point for reserving the campsite. The user will provide his/her email & full name at the time of reserving the campsite along with intended arrival date and departure date. Return a unique booking identifier back to the caller if the reservation is successful.
- The unique booking identifier can be used to modify or cancel the reservation later on. Provide appropriate end point(s) to allow modification/cancellation of an existing reservation
- Due to the popularity of the island, there is a high likelihood of multiple users attempting to reserve the campsite for the same/overlapping date(s). Demonstrate with appropriate test cases that the system can gracefully handle concurrent requests to reserve the campsite.
- Provide appropriate error messages to the caller to indicate the error cases.
- In general, the system should be able to handle large volume of requests for getting the campsite availability.
- There are no restrictions on how reservations are stored as long as system constraints are not violated.

Check campsite availability

API Link: **/checkAvailability**

Type of call: GET

Expected Return: Default one month availability checking from today

Note: A link is embedded to check with Date range (Date of selected link as start date and plus one month as end date)

API Link: **/checkAvailabilitywithRange?startDate= yyyy-MM-dd&endDate=yyyy-MM-dd**

Type of call: GET

Expected Return: Availability checking based on provided date range. Both Start date and end date must be provided.

Validation: Input date type validation defined using Spring Validation

Note: A link is embedded to check with Date range (Date of selected link as start date and plus one month as end date) and a another link to view all available date

Search Booking

API Link: **/bookings**

Type of call: GET

Expected Return: The whole list of existing bookings

Note: A link is embedded to view booking of individual

API Link: **/bookings/{id}**

Type of call: GET

Expected Return: Booking search using provided booking ID

Validation: booking ID existence validation

Note: A link is embedded to view all existing booking

Reservation

API Link: **/reserve**

Type of call: POST

Body: {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2020-12-10", "departureDate": "2020-12-11"}

Validation: - Input date type validation defined using Spring Validation

- Provided date range validation
- Validate availability of the booking date before saving to avoid concurrency issue

Expected Return: If all validation passed, reservation will be created under given information and user will see booking ID and details of the booking.

Notes: A link to modify and cancel the booking is embedded upon successful reservation

API Link: **/reserve/{id}/modify**

Type of call: PUT

Body: {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2020-12-10", "departureDate": "2020-12-11"}

Validation: - Input date type validation defined using Spring Validation

- Provided date range validation
- Validate availability of the booking date before saving to avoid concurrency issue
- Validate the status of the booking
- booking ID existence validation

Expected Return: If all validation passed, reservation will be updated with new information and user will see the updated details of the booking.

Notes: A link to modify and cancel the booking is embedded upon successful update. User will be able to provide only the information they want to update. [e.g provide body as { "departureDate": "yyyy-MM-dd"}]

API Link: **/reserve/{id}/cancel**

Type of call: PUT

Validation: - Booking ID existence validation

- Booking Status validation

- Arrival Date validation (user cannot cancel the reservation that is in progress)

Expected Return: If all validation passed, reservation will be updated as Cancelled.

API Link: **/reserve/{id}/complete**

Validation: - Booking ID existence validation

- Booking Status validation

Expected Return: If all validation passed, reservation will be updated as Completed.

Note: Added this for check out process to complete the status of the booking

Test cases

Test Scenario	Test Case	Test Data	Expected Result	Error Message
Search campsite availability	Call http://localhost:8080/checkAvailability	Data available for one month date range	Default one month availability result from today	N.A
Search campsite availability	Call http://localhost:8080/checkAvailability	No available date for one month date range	Error message	No available date for one month from now!
Search campsite availability with date range	Call http://localhost:8080/checkAvailabilitywithRange?startDate=2020-12-11&endDate=2021-01-11	Data available for provided date range	Availability checking based on provided date range.	N.A
Search campsite availability with date range	Call http://localhost:8080/checkAvailabilitywithRange?startDate=2020-12-09&endDate=2020-12-10	No available date for provided date range	Error message	No available date for provided date range!
Search booking with ID	Call http://localhost:8080/bookings/1	Booking ID 1 exists	Booking search using provided booking ID	N.A
Search booking with ID	Call http://localhost:8080/bookings/9	Booking ID 9 does not exist	Error message	Booking ID 9 does not exists!
Make reservation	Call http://localhost:8080/reserve or http://localhost:8080/reserve/2/modify Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2020-12-15", "departureDate": "2020-12-17"}	Existing booking in database for provided date	Error message to avoid concurrency issue	Selected booking date is not available!
Make reservation	Call http://localhost:8080/reserve or http://localhost:8080/reserve/2/modify Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2020-12-01", "departureDate": "2020-12-05"}	Provided arrival date is in the past	Error message	Arrival date must be minimum one day ahead!

Make/ Modify reservation	Call http://localhost:8080/reserve or http://localhost:8080/reserve/2/modify Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2020-12-09", "departureDate": "2020-12-13"}	Provided reservation duration is more than three day	Error message	Unable to reserve more than three days!
Make/ Modify reservation	Call http://localhost:8080/reserve or http://localhost:8080/reserve/2/modify Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2021-01-09", "departureDate": "2021-01-10"}	Provided Arrival date is after a month	Error message	Reservation can only be done for a month in advance!
Make/ Modify reservation	Call http://localhost:8080/reserve or http://localhost:8080/reserve/2/modify Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2021-01-03", "departureDate": "2021-01-01"}	Provided Departure date is before the arrival date	Error message	Departure date can not be later than arrival date!
Make reservation	Call http://localhost:8080/reserve or http://localhost:8080/reserve/2/modify Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2021-01-03", "departureDate": "2021-01-03"}	Provided arrival date and departure date are the same	Error message	Duration must be at least one day!
Make reservation	Call http://localhost:8080/reserve or http://localhost:8080/reserve/2/modify Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2021-01-01", "departureDate": "2021-01-03"}	All given data are correct	Reservation will be created/updated under given information and user will see booking ID and details of the booking.	N.A
Make reservation for	Call http://localhost:8080/reserve Provide body as {"firstName": "Ron", "lastName": "Weasley", "email": "ronweasley@gmail.com", "arrivalDate": "2020-12-10", "departureDate": "2020-12-13"}	Total days across 2 bookings under same	Error Message	Unable to book more than three day in a row!

consecutive bookings	Compare with booking ID 2	user exceed three day limit		
Make reservation for consecutive bookings	Call http://localhost:8080/reserve Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2021-01-03", "departureDate": "2021-01-03"} Compare with booking ID 3	Total days across 2 bookings under same user exceed three day limit	Error Message	Unable to book more than three day in a row!
Modify reservation	Call http://localhost:8080/reserve/1/modify Provide body as {"firstName": "Thomas", "lastName": "Golden", "email": "thomasgolden@gmail.com", "arrivalDate": "2021-01-03", "departureDate": "2021-01-03"}	Booking in database has COMPLETED status	Error message	You can't modify a reservation that is in the COMPLETED status!
Cancel reservation	Call http://localhost:8080/reserve/5/cancel	Booking ID 5 exists and status is Active	Reservation will be updated as Cancelled	N.A
Cancel reservation	Call http://localhost:8080/reserve/55/cancel	Booking ID 55 does not exist	Error message	Booking ID 55 does not exists!
Cancel reservation	Call http://localhost:8080/reserve/1/cancel	Booking ID 1 status is Completed	Error message	You can't complete a reservation that is in the COMPLETED status!
Cancel reservation	Call http://localhost:8080/reserve/2/cancel	Booking ID 1 status is Active but Arrival date is before today date	Error message	Unable to cancel the reservation that is already active!