

Mac Santa Cruz
CS 493
Final Project
December 8 2019

Final Project : Rest API

CS 493: Cloud Application Development

Fall 2019

Oregon State University

Last Update: Dec 8, 2019. 11:00 am Pacific

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URL where Application is Deployed:

<http://final-santacrm.appspot.com>

URL for Account Creation/Login:

<http://final-santacrm.appspot.com>

Entity Structures:

Entity 1: day

```
{  
  date: " //This is a unique value that should be in the format mm/dd/yyyy  
  Owner: " //This will be the subID of the provided JWT  
  program: " //This is a string, the name of the strength program you are on  
  weekNumber: //The week number of the program  
  lifts:[] //List of exercises you performed on this day  
  self: " //self link  
  id: " // Datastore id  
}
```

Entity 2: lift

```
{  
  name: " //name of the exercise/lift you performed  
  reps: //number of repetitions performed per set  
  sets: //number of sets performed per lift  
  self: " //self link  
  id: " //Datastore id  
  owner: " //This will be the subID of the provided JWT  
  liftDate: " //the day/date this this exercise was performed  
}
```

```
}
```

Relationship:

The relationship of the two entities above is defined by liftDate and lifts list. When a lift gets added to a day's lifts list then it will become one of the entries in the list and its liftDate will be changed to the date of the day's date. If a lift is deleted it will be removed from the day's list. If a day is deleted it will remove the lifts and update their liftDate value.

User Entity:

```
{
  firstName: "",//First Name associated with JWT and email
  subID: "",//Google generated identifier unique
  lastName: "",//Last Name associated with JWT and email
  id: "",//Datastore ID
}
```

I use the subID only to reference the User entity. When you go to sign in, starting from the home page and using Google API after that, the returned subID will be compared to every entity in the list and a new entry will be created if it is not present in the list. Otherwise the user list will be unchanged.

The User Entity subID value is included with every entity they create. This is used to identify who has privileges over the entity and who created it.

Create a Day

Allows you to create a new day.

<http://final-santacrm.appspot.com/days>

POST /days

Request

Request Parameters

None

Request Headers

content -type

Authorization

Request Body

Required

Request Body Format (MIME)

JSON

Request JSON Attributes

Name	Type	Description	Required?
------	------	-------------	-----------

date	String	The date of this lifting day.	Yes
program	String	The current program you are running.	Yes
weekNumber	Integer	The weekNumber of this program you are on.	Yes

Request Body Example

```
{
  "date": "05/29/2019",
  "program": "Baker",
  "weekNumber": 5
}
```

Response

Response Body Format
JSON

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	The Day object was created correctly and a response JSON object will be sent.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	The server will return a 403 when the date of the day is already taken. Another 403 can occur if the post is missing one of the required attributes. These are date, program, and weekNumber
Failure	415 Incorrect Type	This will occur if client sends data that is not labeled with the header content-type = application/json

Response Examples

Success

Status: 201 Created

```
{
  "id": "abc123",
  "date": "05/29/2019",
  "program": "Baker",
}
```

```
"weekNumber": 5,  
"self": "https://<your-app>/days/abc123",  
"owner": "1029329423",  
"lifts": []  
}
```

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 Date repeat

```
{  
  "Error": "Date already Exists"  
}
```

Failure

Status: 415 Incorrect Type

```
{  
  "Error": "Server only accepts application/json data."  
}
```

Get Day Collection

Allows you to get the list of all days found in the database. No authorization is required.

<http://final-santacrm.appspot.com/days>

Get /days

Request

Request Parameters

None

Request Headers

accepts

Request Body

None

Request Body Format (MIME)

none

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 Created	List of day objects will be returned. The last key will be the number of days in the database. Pagination is also

		implemented and after 5 day entities and next link will be provided if a 6th and so on entity exist.
Failure	406 Not Acceptable	If you try to set the accept header to anything but application/json then you will error.

Response Examples

Success

```
Status: 200 OK
{
  items: [
    {
      self: "http://final-santacrm.appspot.com/days/5077688091934720",
      owner: "106892015755312156929",
      date: "5/27/2019",
      lifts: [ ],
      program: "Baker",
      weekNumber: 5,
      id: "5077688091934720"
    },
    {
      self: "http://final-santacrm.appspot.com/days/5180000076562432",
      owner: "106892015755312156929",
      date: "5/26/2019",
      lifts: [ ],
      program: "Baker",
      weekNumber: 5,
      id: "5180000076562432"
    }
  ]size: 2
}
```

Failure

```
Status: 406 Not Acceptable
{
  "Error": "server cannot send back that mime type"
}
```


Get a Single Day

Allows you to get a single day.

<http://final-santacrm.appspot.com/days/:dayID>

GET /days/:dayID

Request

Request Parameters

dayID

Request Headers

content -type

Request Body

None

Request Body Format (MIME)

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	The day exists and will be returned in a json format
Failure	404 Not Found	Day with this dayID does not exist

Response Examples

Success

Status: 200 OK

```
{
  self: "http://final-santacrm.appspot.com/days/5077688091934720",
  owner: "106892015755312156929",
  date: "5/27/2019",
  lifts: [ ],
  program: "Baker",
  weekNumber: 5
}
```

Failure

Status: 404 Not Found

```
{
  "Error": "No day with this day_id exists"
}
```

Edit/Put a Day

Allows you to edit all available to edit the attributes of a day.

<http://final-santacrm.appspot.com/days/:dayID>

PUT /days/:dayID

Request

Request Parameters

dayID

Request Headers

content -type

Authorization

Request Body

Required

Request Body Format (MIME)

JSON

Request JSON Attributes

Name	Type	Description	Required?
date	String	The date of this lifting day.	Yes
program	String	The current program you are running.	Yes
weekNumber	Integer	The weekNumber of this program you are on.	Yes

Request Body Example

```
{  
  "date": "05/29/2019",  
  "program": "Baker",  
  "weekNumber": 5  
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	204 No content	The day object has been properly updated. Use get to check.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	The server will return a 403 when the date of the day is already taken. Another 403 can occur if the provided JWT does not own this entity.
Failure	404	If put is missing one of the required attributes. These are date, program, and weekNumber. Put requires all of these. See patch for alternative.
Failure	415 Incorrect Type	This will occur if client sends data that is not labeled with the header content-type = application/json

Response Examples

Success

Status: 204 No response

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 Date repeat

```
{  
  "Error": "Date already Exists"  
}
```

Failure

Status: 403 JWT does not correspond with proper owner

```
{  
  "Error": "owner Associated with given JWT does not own this date entry"  
}
```

Failure

Status: 404 Missing an Attribute

```
{  
  "Error": "Missing one of the attributes. Please send a date, program, and  
weekNumber. Otherwise use patch."  
}
```

Failure

Status: 415 Incorrect Type

```
{  
  "Error": "Server only accepts application/json data."  
}
```

Edit/Patch a Day

Allows you to edit some attributes of a day.

<http://final-santacrm.appspot.com/days/:dayID>

PATCH /days/:dayID

Request

Request Parameters

dayID

Request Headers

content -type

Authorization

Request Body

Required

Request Body Format (MIME)

JSON

Request JSON Attributes

Name	Type	Description	Required?
date	String	The date of this lifting day.	no
program	String	The current program you are running.	no
weekNumber	Integer	The weekNumber of this program you are on.	no

Request Body Example

```
{  
  "date": "05/29/2019"  
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	204 No content	The day object has been properly updated. Use get to check.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	The server will return a 403 when the date of the day is already taken. Another 403 can occur if the provided JWT does not own this entity.
Failure	415 Incorrect Type	This will occur if client sends data that is not labeled with the header content-type = application/json

Response Examples

Success

Status: 204 No response

Failure

Status: 401 Missing or Incorrect JWT

Failure

```
Status: 403 Date repeat
{
  "Error": "Date already Exists"
}
```

```
Status: 403 JWT does not correspond with proper owner
{
  "Error": "owner Associated with given JWT does not own this date entry"
}
```

Failure

```
Status: 415 Incorrect Type
{
  "Error": "Server only accepts application/json data."
}
```

Delete a Day

Allows you to delete a day.

<http://final-santacrm.appspot.com/days/:dayID>

DELETE /days/:dayID

Request

Request Parameters

dayID

Request Headers

Authorization

Request Body

NONE

Request Body Format (MIME)

NONE

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	204 No content	The day object has been properly deleted. Use get to check.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	The server will return a 403 when the date doesn't exist. Another 403 can occur if the provided JWT does not own this entity.

Response Examples

Success

Status: 204 No response

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 Date doesn't exist

```
{  
  "Error": "No Date with this date_id exists"  
}
```

Status: 403 JWT does not correspond with proper owner

```
{  
  "Error": "owner Associated with given JWT does not own this date entry"  
}
```

Create a Lift

Allows you to create a new lift.

<http://final-santacrm.appspot.com/lifts>

POST /lifts

Request

Request Parameters

None

Request Headers

content -type

Authorization

Request Body

Required

Request Body Format (MIME)

JSON

Request JSON Attributes

Name	Type	Description	Required?
name	String	The name of the lift.	Yes
reps	integer	Number of reps performed	Yes
sets	Integer	Number of sets performed	Yes

Request Body Example

```
{  
  "name": "deadlift",  
  "reps": 5,  
  "sets": 5  
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	201 Created	The lift object was created correctly and a response JSON object will be sent.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	if the post is missing one of the required attributes. These are name, sets, reps
Failure	415 Incorrect Type	This will occur if client sends data that is not labeled with the header content-type = application/json

Response Examples

Success

Status: 201 Created

```
{
  "id": "abc123",
  "name": "deadlift",
  "reps": 5,
  "sets": 5,
  "self": "https://<your-app>/days/abc123",
  "owner": "1029329423",
  "liftDate": ''
}
```

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 Date repeat

```
{
  "Error": "The request object is missing at least one of the required attributes."
}
```

Failure

Status: 415 Incorrect Type

```
{
  "Error": "Server only accepts application/json data."
}
```

Get lift Collection

Allows you to get the list of all lifts found in the database. No authorization is required.

<http://final-santacrm.appspot.com/lifts>

Get /lifts

Request

Request Parameters

None

Request Headers

accepts

Request Body

None

Request Body Format (MIME)

none

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 Created	List of lifts objects will be returned. The last key will be the number of days in the database. Pagination is also implemented and after 5 day entities and next link will be provided if a 6th and so on entity exist.
Failure	406 Not Acceptable	If you try to set the accept header to anything but application/json then you will error.

Response Examples

Success

```
Status: 200 OK
{
{
items: [
```

```
{
  liftDate: "",
  reps: 3,
  sets: 3,
  self: "http://final-santacrm.appspot.com/lifts/5694034018304000",
  owner: "106892015755312156929",
  name: "bench",
  id: "5694034018304000"
},
{
  sets: 5,
  self: "http://final-santacrm.appspot.com/lifts/5705076043677696",
  owner: "106892015755312156929",
  name: "squat",
  liftDate: "",
  reps: 5,
  id: "5705076043677696"
}
],
size: 2
}
```

Failure

```
Status: 406 Not Acceptable
{
  "Error": "server cannot send back that mime type"
}
```

Get a Single Lift

Allows you to get a single lift.

<http://final-santacrm.appspot.com/lifts/:liftID>

```
GET /lifts/:liftID
```

Request

Request Parameters

liftID

Request Headers

content -type

Request Body

None

Request Body Format (MIME)

None

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	The lift exists and will be returned in a json format
Failure	404 Not Found	Lift with this liftID does not exist

Response Examples

Success

Status: 200 OK

```
{
  sets: 3,
  self: "http://final-santacrm.appspot.com/lifts/5694034018304000",
  owner: "106892015755312156929",
  name: "bench",
```

```
liftDate: "",  
reps: 3  
}
```

Failure

```
Status: 404 Not Found  
{  
  "Error": "No lift with this lift_id exists"  
}
```

Edit/Put a Lift

Allows you to edit all available to edit the attributes of a lift.

<http://final-santacrm.appspot.com/lifts/:liftID>

```
PUT /lifts/:liftID
```

Request

Request Parameters

liftID

Request Headers

content -type

Authorization

Request Body

Required

Request Body Format (MIME)

JSON

Request JSON Attributes

Name	Type	Description	Required?
name	String	The name of the lift.	Yes
reps	integer	Number of reps performed	Yes
sets	Integer	Number of sets performed	Yes

Request Body Example

```
{  
  "name": "deadlift",  
  "reps": 5,  
  "sets": 5  
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	204 No content	The lift object has been properly updated. Use get to check.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	Another 403 can occur if the provided JWT does not own this entity.
Failure	404	If put is missing one of the required attributes. These are name , reps, sets. Put requires all of these. See patch for alternative.
Failure	415 Incorrect Type	This will occur if client sends data that is not labeled with the header content-type = application/json

Response Examples

Success

Status: 204 No response

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 JWT does not correspond with proper owner

```
{
  "Error": "owner Associated with given JWT does not own this date entry"
}
```

Failure

Status: 404 Missing an Attribute

```
{
  "Error": "Missing one of the attributes. Please send a name, sets, and reps.
  Otherwise use patch."
}
```

Failure

Status: 415 Incorrect Type

```
{
  "Error": "Server only accepts application/json data."
}
```

Edit/Patch a Lift

Allows you to edit all available to edit the attributes of a lift.

<http://final-santacrm.appspot.com/lifts/:liftID>

PATCH /lifts/:liftID

Request

Request Parameters

liftID

Request Headers

content -type

Authorization

Request Body

Required

Request Body Format (MIME)

JSON

Request JSON Attributes

Name	Type	Description	Required?
name	String	The name of the lift.	no
reps	integer	Number of reps performed	no
sets	Integer	Number of sets performed	no

Request Body Example

```
{  
  "reps": 2,  
  "sets": 5  
}
```

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
---------	-------------	-------

Success	204 No content	The lift object has been properly updated. Use get to check.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	Another 403 can occur if the provided JWT does not own this entity.
Failure	404	If put is missing one of the required attributes. These are name , reps, sets. Put requires all of these. See patch for alternative.
Failure	415 Incorrect Type	This will occur if client sends data that is not labeled with the header content-type = application/json

Response Examples

Success

Status: 204 No response

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 JWT does not correspond with proper owner

```
{
  "Error": "owner Associated with given JWT does not own this date entry"
}
```

Failure

Status: 404 Missing an Attribute

```
{
  "Error": "Missing one of the attributes. Please send a name, sets, and reps.
  Otherwise use patch."
}
```

Failure

Status: 415 Incorrect Type

```
{
  "Error": "Server only accepts application/json data."
}
```

Delete a Lift

Allows you to delete a lift.

<http://final-santacrm.appspot.com/lifts/:liftID>

DELETE /lifts/:liftID

Request

Request Parameters

liftID

Request Headers

Authorization

Request Body

NONE

Request Body Format (MIME)

NONE

Response

Response Body Format

JSON or NONE

Response Statuses

Outcome	Status Code	Notes
Success	204 No content	The lift object has been properly deleted. Use get to check.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	The server will return a 403 when the lift doesn't exist. Another 403 can occur if the provided JWT does not own this entity.

Response Examples

Success

Status: 204 No response

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 Lift doesn't exist

```
{  
  "Error": "No Lift with this date_id exists"  
}
```

Status: 403 JWT does not correspond with proper owner

```
{  
  "Error": "owner Associated with given JWT does not own this date entry"  
}
```

Put a Lift in a Day list

Allows you to add a lift to a day lifts list and update the liftDate of the lift to the day with the given dayID.

<http://final-santacrm.appspot.com/lifts/:liftID/:dayID>

PUT /lifts/:liftID/:dayID

Request

Request Parameters

liftID

dayID

Request Headers

content -type

Authorization

Request Body

NONE

Request Body Format (MIME)

NONE

Response

Response Body Format

JSON or NONE

Response Statuses

Outcome	Status Code	Notes
Success	204 No content	The lift object has been properly put in the lifts list. Use get to check.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	If the lift is already assigned If the provided owner, jwt, does not correspond to the entities owner.
Failure	404	If either the lift or day do not exist. The day and lift are owned by different people

Response Examples

Success

Status: 204 No response

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 JWT does not correspond with proper owner

```
{  
  "Error": "owner Associated with given JWT does not own this date entry"  
}
```


Failure

```
Status: 403 Lift is already assigned
{
  "Error": "This lift is already assigned"
}
```

Remove a Lift from a Day list

Allows you to remove a lift from a day lifts list and update the liftDate of the lift to an empty string.

<http://final-santacrm.appspot.com/lifts/:liftID/:dayID>

```
DELETE /lifts/:liftID/:dayID
```

Request

Request Parameters

liftID

dayID

Request Headers

content -type

Authorization

Request Body

NONE

Request Body Format (MIME)

NONE

Response

Response Body Format

JSON or NONE

Response Statuses

Outcome	Status Code	Notes
Success	204 No content	The lift object has been properly removed from the lifts list. Use get to check.
Failure	401 unauthorized	If a JWT is missing or isn't a valid JWT then this will return a 401.
Failure	403 Forbidden	If the lift is not in this days list. If the provided owner, jwt, does not correspond to the entities owner.
Failure	404	If either the lift or day do not exist. The day and lift are owned by different people

Response Examples

Success

Status: 204 No response

Failure

Status: 401 Missing or Incorrect JWT

Failure

Status: 403 JWT does not correspond with proper owner

```
{  
  "Error": "owner Associated with given JWT does not own this date entry"  
}
```

Failure

Status: 403 Lift is already assigned

```
{  
  "Error": "This lift is not in the list"  
}
```

Get User Collection

Allows you to get the list of all users found in the database. No authorization is required.

<http://final-santacrm.appspot.com/users>

Get /users

Request

Request Parameters

None

Request Headers
accepts

Request Body
None

Request Body Format (MIME)
none

Response

Response Body Format
JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 Created	List of users objects will be returned. The last key will be the number of days in the database.

Response Examples

Success

Status: 200 OK

```
[
  {
    subID: "106892015755312156929",
    lastName: "Santa Cruz",
    firstName: "Mac",
    id: "5647975057457152"
  },
  {
    subID: "105011916526581790731",
    lastName: "Santa Cruz",
    firstName: "McIntyre Marcelo",
    id: "5681556802764800"
  }
]
```

Get all single User created Entities

Allows you to get the list of all the entities created by one user.

<http://final-santacrm.appspot.com/users/:subID>

Get /users/:subID

Request

Request Parameters

subID

Request Headers

Authorization

Request Body

None

Request Body Format (MIME)

none

Response

Response Body Format

JSON

Response Statuses

Outcome	Status Code	Notes
Success	200 OK	List of lifts objects and day objects will be returned All of them will have been made by the user provided.
Failure	401 Unauthorized	The JWT provided must be used to create a subID which equals the subID provided in the url.

Response Examples

Success

```
Status: 200 OK
{
  {
    items: [
      {
        liftDate: "",
        reps: 3,
        sets: 3,
        self: "http://final-santacrm.appspot.com/lifts/5694034018304000",
        owner: "106892015755312156929",
        name: "bench",
        id: "5694034018304000"
      },
      {
        sets: 5,
        self: "http://final-santacrm.appspot.com/lifts/5705076043677696",
        owner: "106892015755312156929",
        name: "squat",
        liftDate: "",
        reps: 5,
        id: "5705076043677696"
      },
      {
        self: "http://final-santacrm.appspot.com/days/5077688091934720",
        owner: "106892015755312156929",
        date: "5/27/2019",
```

```
lifts: [],  
program: "Baker",  
weekNumber: 5,  
id: "5077688091934720"  
}  
]  
}
```

Failure

Status: 401 Unauthorized

Known Bugs/Problems and Using Postman

Using Postman:

Go to the root url/sign in url and sign in using google.

Once you have properly done that the JWT will be provided. This can be copy and pasted into the JWT global variable in postman. The URL variable should not be cleared but the rest of them should be fine to clear.

Bugs:

I am currently failing one Postman test for attempting to put a lift that has already been assigned to another day. This only fails if you run the postman automatic test. This won't fail if you do each test individually. I think the bug maybe due to postman asynchronously running the tests which would mean that the lift hasn't already been assigned so it returns a 204 when it should be a 404.

One bug in the program itself is deleting a boat with lifts in its lifts list and attempting to update those lifts to have an empty string for their liftDate attribute. I tried to update the values in a for loop and then save each lift but again I think this is bugged because of promises. I couldn't quite figure out why it was breaking. If the day gets deleted but I have a list of the lifts before it was deleted I should still be able to loop through them. I think it has something to do with having a

promise inside of a for loop. My final implementation, which I have commented out, would properly update the first lift in the list to have an empty liftDate but the rest of the lifts were not updated. Again I think this is because I fetch a lift from the database in a for loop so I think while it is fetching the for loop iterates to the next step and then fetches again but the first fetch hasn't returned so it will get overwritten by the second fetch.

Deleting a lift which is currently assigned to a list does properly work.

Other bugs is the program doesn't handle getting null values for request parameters but I believe the expectation is that these will be entered in properly.

Thank you for grading all my work this year and being available when problems arose. Have a great winter break.