Exercise: API Testing with Postman

This document defines the exercise assignments for
the "Back-End Technologies Basics" Course @ SoftUni.

0. Create a Trello account

In the upcoming exercise we will use the **API provided by Trello**. If you don't already have an account in Trello, create one by going to **trello.com** and then clicking on "**Get Trello for Free**" button. **Don't use your corporate e-mail**, because your organization may already have other Atlassian products associated with your email and you may get errors if you try to use Trello. You can use a **disposable mail service** like:
https://temp-mail.org/en/ https://www.disposablemail.com/ https://www.emailondeck.com/

The following tasks are **not mandatory:**

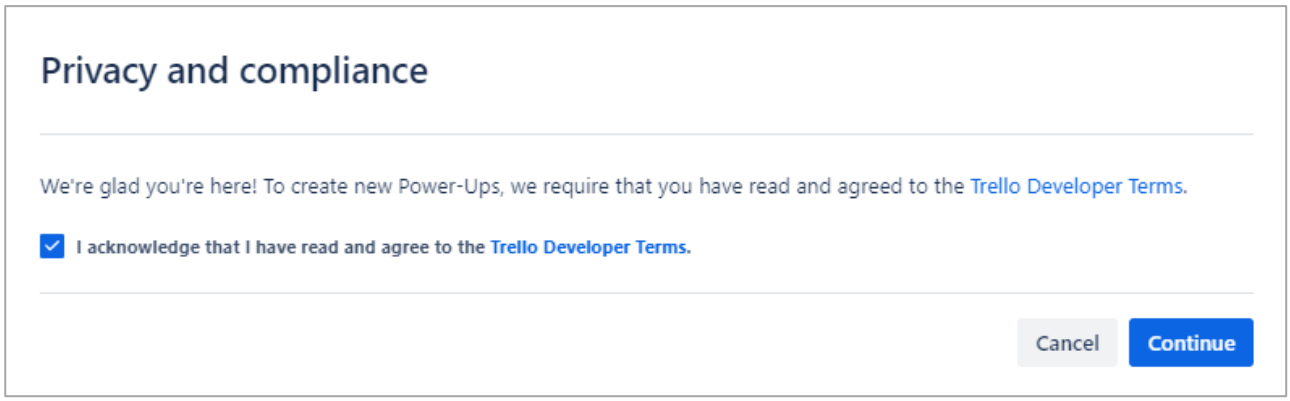
- After account setup, create a new board named **"Learning Postman".**
- On the board, create lists titled **"To Do" and "Done" to organize tasks**.
- Add tasks such as **"Sign up for Trello"**, **"Read API documentation"**, and **"Use the Trello API"** to the **"To Do"** list.
- Move tasks to the **"Done" list**, once they are **completed.**

The **API will allow us instead of using the trello.com website**, to use **Postman to interact with it and create boards, lists, tasks, manage and test them.**

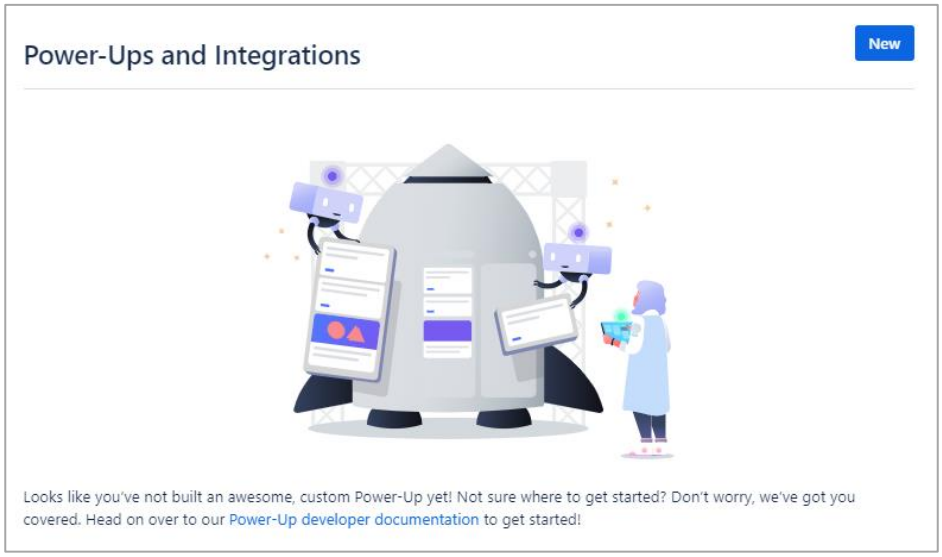
1. Trello API Authentication and Authorization

In order to **use** the **Trello API**, we need to have an **API Key** and **Token**. Trello API **doesn't use passwords**. In order to have API Key and Token we need to **create Trello Power-Up**. At its core a Power-Up is **just a configuration**. So just follow the next steps to generate all the attributes needed or you can read Trello documentation.

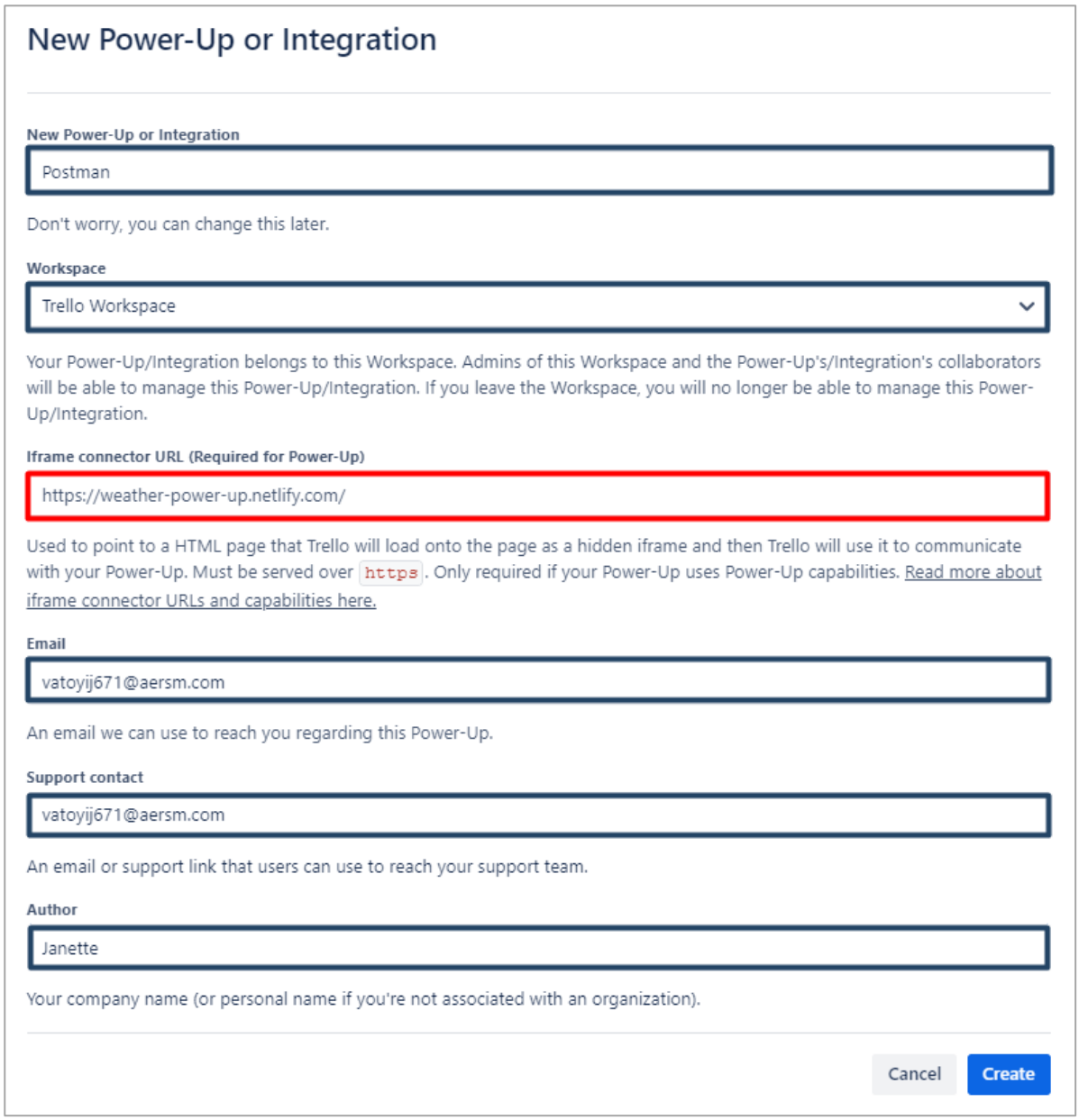
- Go to https://trello.com/power-ups/admin
- Agree to the Trello Developer Terms



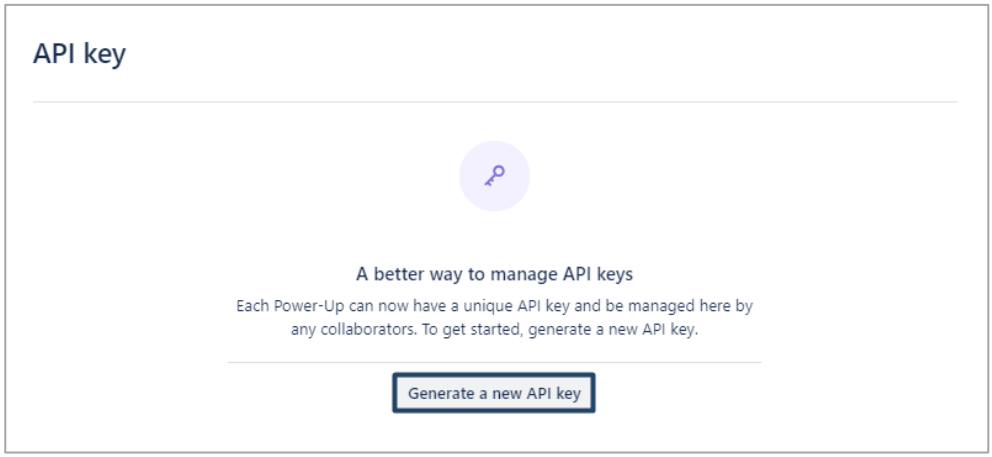
- Create a New Power-Up



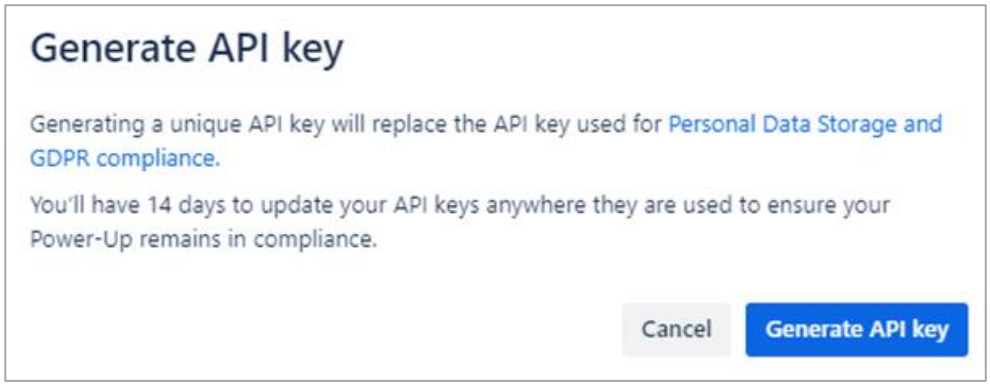
- **Fill in some data**. **Leave the red one as it is**. We **named our Power-Up "Postman"**, but feel free to choose otherwise.



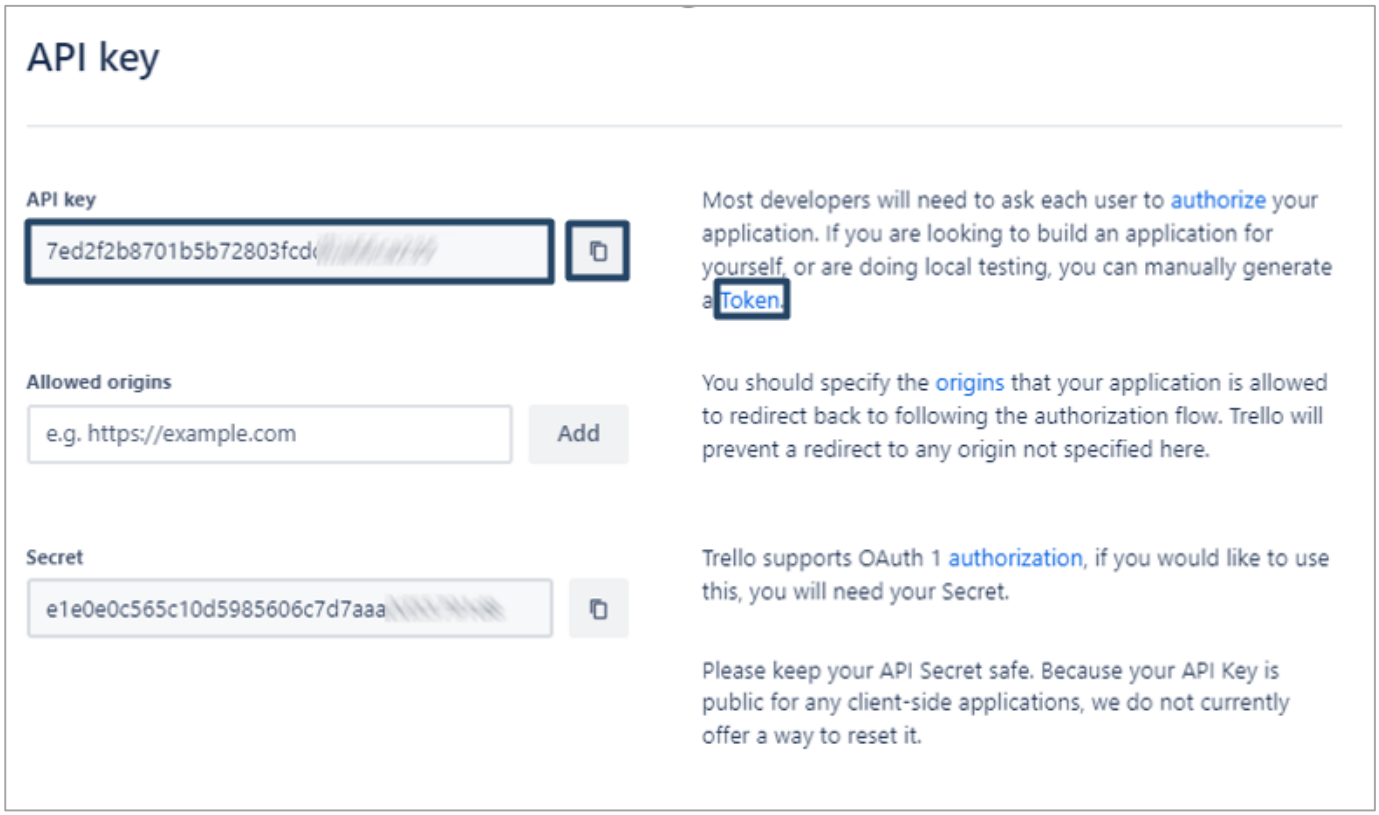
- Click on **"Generate a new API Key button"**



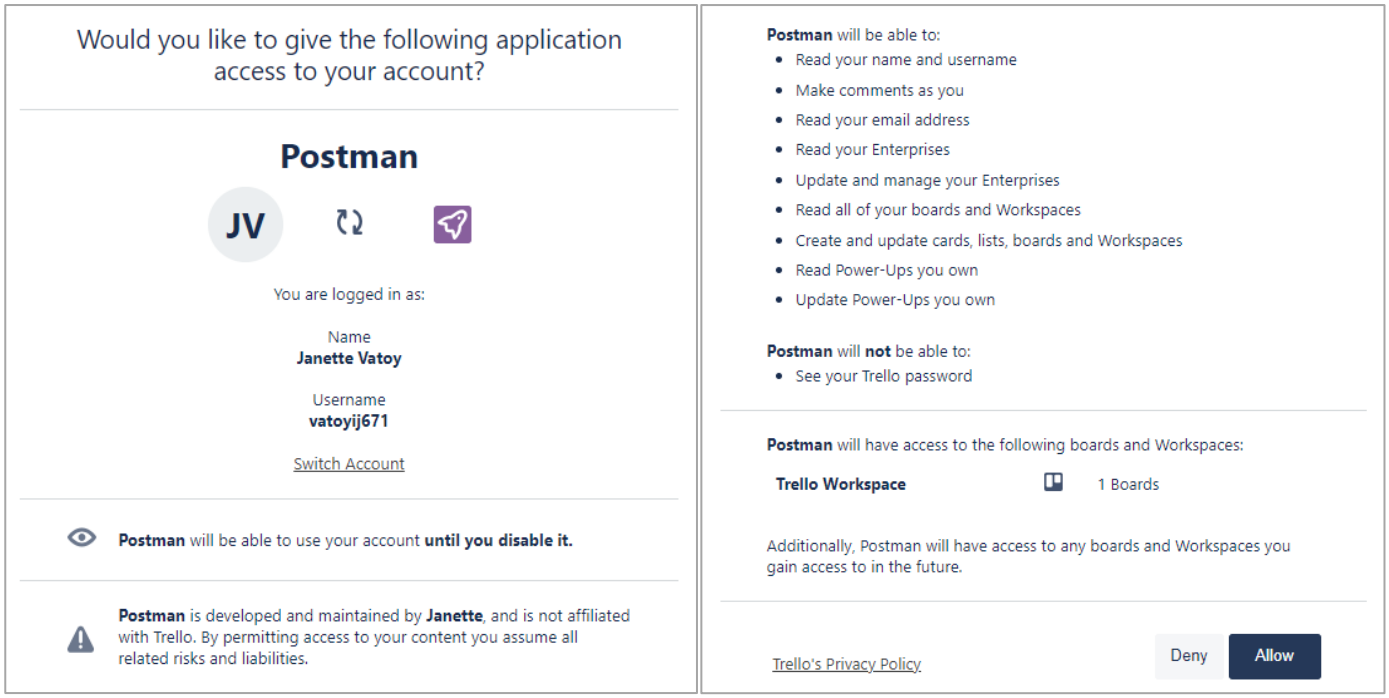
- And then **"Generate API key"**



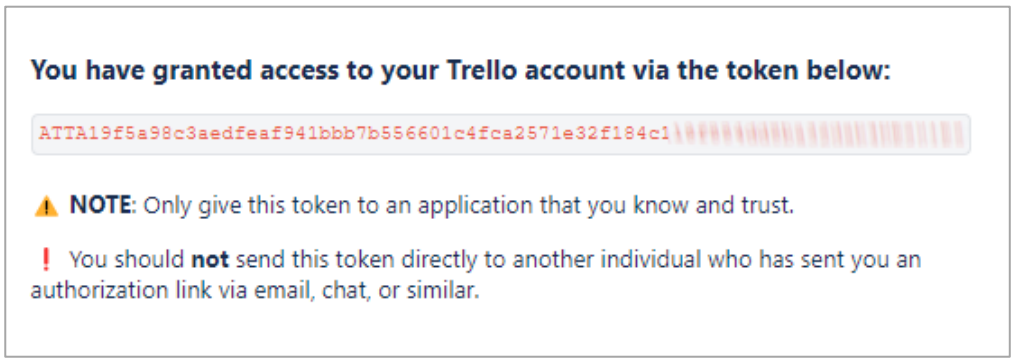
- We need the **API key**. **Forget the other options**. **Copy and paste your API Key somewhere safe**, because we will need it in order to make requests and click on **Token**.



- On the page that will **open in a new tab**, you have to **give permission** to **your Power-Up** (in our case, we named our Power-Up "Postman", remember?) to **use your Trello Account**.



- And it will **generate your Token**. **Copy and paste this Token somewhere safe**, because you will need it in your Postman requests.



2. First Request

Now that **you have you API Key** and **your Token**, (you can think of your API Key as a username and Token as a password) let's try our first API call. We will get all of the boards from our workspace. Considering you have at least one.

```
https://api.trello.com/1/members/me/boards?key={yourKey}&token={yourToken}
```

So, what we see here is the **endpoint**, which is: **https://api.trello.com/1/members/me/boards**
And two query parameters – **key and token**. **This is the syntax that this API uses.** You need to **replace "yourKey"** with the value of your **API key** and **"yourToken"** with the value of your **Token**. Remember that these **{ }** are just placeholders, so remove them.

- So, send your first request!
- In the response returned you should see the board that we created via Trello website or any other board that you have in the Trello Workspace.

```
{
    "id": "65d8695947a2f67af7729472",
    "nodeId": "ari:cloud:trello::board/workspace/65d5a88ad5919529053fd980/
        65d8695947a2f67af7729472",
    "name": "Learning Postman",
    "desc": "",
    "descData": null,
    "closed": false,
    "dateClosed": null,
    "idOrganization": "65d5a88ad5919529053fd980",
    "idEnterprise": null,
    "limits": {
```


3. Create a Collection for your Requests

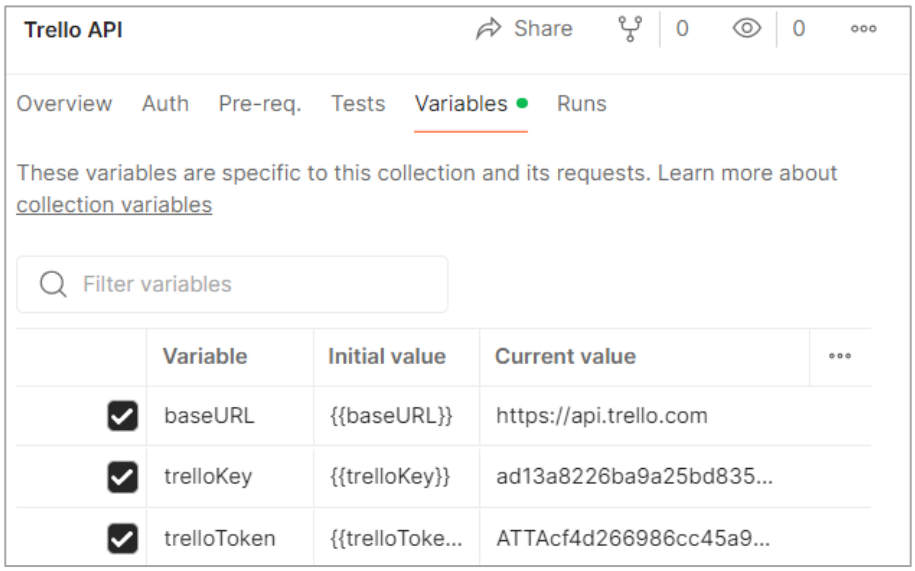
We've already created a collection that you need to import in Postman.

- Give it a **proper name**. We called ours "**Trello API**" (not very creative)
- **Move** the above **request** in the **"Trello API" Collection** and **rename it to "Get All Boards"**

4. Collection Variables

Since we will **use https://api.trello.com in all of our requests**, also **each request requires authentication** (**API key and Token**), let's turn those into **collection variables**.

- Add new **collection variable {{baseURL}}** variable with value **https://api.trello.com**
- Add new **collection variable {{trelloKey}}**
- Add new **collection variable {{trelloToken}}**



- At the end the **URL** of **"Get All Boards" request** should look like this:

5. Trello API Documentation

Whenever you're trying to use a new API, you need to **find and study the API documentation**. It will give you an idea about **everything you need to know** about the API:
https://developer.atlassian.com/cloud/trello/rest/api-group-actions/#api-group-actions

6. Writing requests

0. As you create your requests:

- Feel free to **check Trello's Website** to **observe what's happening;**

1. Get all boards

You've already done this one

2. Create a new board

You can find the URL and the required parameters here:
https://developer.atlassian.com/cloud/trello/rest/api-group-boards/#api-boards-post
Assert that the response code is 200
Note: If you ever get the following message as a response, it means that you have exceeded the maximum of boards that you can have and need to close some of them.

```
{
    "message": "Board must be in a team – specify an idOrganization"
}
```

3. Get a single board

You can find the URL and the required parameters here:
https://developer.atlassian.com/cloud/trello/rest/api-group-boards/#api-boards-id-get
Hint: You can **find the id of the board** from your **"Get All Boards" request**
Assert that the response code is 200

4. Create a TO DO List on your Board

Note: Since Trello creates three sample lists named 'To Do,' 'Doing,' and 'Done' for each new board, please go to Trello.com and archive these lists to avoid any confusion.

You can find the URL and the required parameters here:
https://developer.atlassian.com/cloud/trello/rest/api-group-boards/#api-boards-id-lists-post
Assert that the response code is 200

5. Create a DONE List on your Board

You can find a **different way** to create a list here:
https://developer.atlassian.com/cloud/trello/rest/api-group-lists/#api-lists-post
Assert that the response code is 200

6. Get All Lists from a Board

You can find the URL and the required parameters here:
https://developer.atlassian.com/cloud/trello/rest/api-group-boards/#api-boards-id-lists-get
Assert that the response code is 200

7. **Create a Card in the TO DO List**
   Create a "Sign-up for Trello" card in TO DO list
   You can find the URL and the required parameters here:
   https://developer.atlassian.com/cloud/trello/rest/api-group-cards/#api-cards-post
   Assert that the response code is 200
   Hint: Get the **id of the TO DO list from the previous request**.

8. **Move Card to DONE list**
   This is done via PUT request:
   https://developer.atlassian.com/cloud/trello/rest/api-group-cards/#api-cards-id-put
   Hint: Think what query parameter you need to add in order to change the list
   Assert that the response code is 200

9. **Delete the card**
   You can find the URL and the required parameters here:
   https://developer.atlassian.com/cloud/trello/rest/api-group-cards/#api-cards-id-delete
   Assert that the response code is 200

10. **Delete the board**
    You can find the URL and the required parameters here:
    https://developer.atlassian.com/cloud/trello/rest/api-group-boards/#api-boards-id-delete
    Assert that the response code is 200

    We only have tests asserting the status code is 200, but let's try to run our tests once more one by one. Most of the tests are failing, right? Why is that?

7. Writing Scripts and Tests

Let's take a closer look at our requests

1. **Get All Boards**
   Nothing wrong here. Although, we can add some more tests:
   - **Assert that the API response body is not empty**
   - **Assert that API response time is less than 30 seconds**

```
pm.test("Status code is 200", function () {
    pm.response.to.have.status(200);
});

pm.test("Response time is less than 30 seconds", function () {
    pm.expect(pm.response.responseTime).to.be.below(30000);
});

pm.test("Response body is not empty", function() {
    pm.expect(pm.response.text()).to.not.be.empty;
});
```

2. **Create a new board**
   Nothing wrong here either. **Each time** we're **creating** a new board, with the **same name** (in our case) "Learning Postman", but since **we're deleting the board at the last request of the collection**, we won't end up with multiple boards with the same name.
   - **Assert that the board created has the expected name**

```
pm.test("Status code is 200", function () {
    pm.response.to.have.status(200);
});

const responseData = pm.response.json(); // Parse the response body as JSON

pm.test("Board name is 'Learning Postman'", function () {
pm.expect(responseData.name).to.eql("Learning Postman"); // Assert the name is as expected
});
```

3. **Get a single board**

   This **test** will **pass once** and then **fail each time**. Why is that? **Each time** we're **creating a board**, no matter its name, the **API is giving it a different id**. So, when we try to **Get the board** from the previous request the test will pass just once, because at the end of our collection we are deleting the board and creating a new one with a different id. In order for **this test to pass** we have to **get the id of the board** from the **previous request each time**. How to do that?

   - In the **Tests tab** of the **previous request (Create a new board)**, we parse the response body and **extract the board ID**, then we **set this ID as a collection variable** within Postman.

```
let responseData = pm.response.json(); // Parse the response body as JSON
pm.collectionVariables.set("boardId", responseData.id); // Set the board ID as a collection variable
```

   - Then in the **current request (Get a single board)** use **{{boardId}}** in the URL **as a path variable**.

```
GET    {{baseURL}}/1/boards/{{boardId}}?key={{trelloKey}}&token={{trelloToken}}
```

   - **Assert that the response body has property 'name' of type string and it is equal to 'Learning Postman'**

```
pm.test("Status code is 200", function () {
    pm.response.to.have.status(200);
});

const responseData = pm.response.json();

pm.test("Response body has property 'name' of type string equal to 'Learning Postman'", function() {
    pm.expect(responseData).to.have.property('name'); // Check if the 'name' property exists
    pm.expect(responseData.name).to.be.a('string'); // Verify that 'name' is of type string
    pm.expect(responseData.name).to.eql("Learning Postman"); // Check if 'name' is equal to "Learning Postman"
});
```

4. **Create a TO DO List**

You should **again use {{boardId}}** in the URL, but this time **as a query parameter.**

```
POST    {{baseURL}}/1/lists?key={{trelloKey}}&token={{trelloToken}}&name=TO DO&idBoard={{boardId}}
```

And let's write some more tests:

- **Assert that the response contains all the expected fields**
- **Assert that the 'closed' field is false and is of type Boolean**
- **Assert that the idBoard in the response matches the expected board ID**

```
var jsonData = pm.response.json();

pm.test("Response has all the expected properties", function() {
pm.expect(jsonData).to.have.all.keys('id', 'name', 'closed', 'color', 'idBoard', 'pos', 'limits');
});

pm.test("'closed' is false and of type boolean", function() {
pm.expect(jsonData.closed).to.be.a('boolean');
    pm.expect(jsonData.closed).to.be.false;
});

pm.test("'idBoard' matches expected board ID", function() {
var expectedBoardId = pm.variables.get("boardId"); // Get the board ID from the current environment or collection variables
    pm.expect(jsonData.idBoard).to.eql(expectedBoardId); // Compare the response's board ID with the expected one
});
```

5. **Create a DONE List**

   You should **again use {{boardId}}** in the URL, **as a query parameter.** But how about **this time we are not creating a DONE list, but we create a list with a different name** every single time?!

   - **In the Pre-Request Tab generate a random number and use it as part of the list name**
   - **Sets this unique name as a Postman variable named uniqueListName**
   - **Replace the static list name with the variable {{uniqueListName}} you've just set in the Pre-request Script**
     Note: You can use Math.random or add the current date and time to create a unique name

At first **{{iniqueListName}}** will light as **Unresolved Variable**, this is because we have to execute the request in order to run the pre-request script and to set the variable.

- **Assert that that the list created matches the unique name used in creation**

```
pm.test("List name matches the unique name used in creation", function() {
    var responseData = pm.response.json(); // Get the response data
    var expectedName = pm.variables.get("uniqueListName"); // Retrieve the saved unique name

    pm.expect(responseData.name).to.eql(expectedName); // Assert the names match
});
```

Note: Don't forget to rename the request from "**Create a DONE List" to something like "Move Card to List with Unique Name"**

- **Add the following in the Tests tab as well. Believe me you will need it.** 😉

```
var uniqueListId = responseData.id;
pm.collectionVariables.set("uniqueListId",uniqueListId);
```

6. Get All Lists from a Board

Nothing special here. Just replace the path variable {id} with the {{boardId}} variable

```
GET    {{baseURL}}/1/boards/{{boardId}}/lists?key={{trelloKey}}&token={{trelloToken}}
```

Think what you can assert here?!

- **Response is an Array**
- **Array is not empty**
- **Presence of a List with a Specific Name**

```
pm.test("Response array is not empty", function() {
    pm.expect(pm.response.json()).to.not.be.empty;
});

pm.test("Response is an array", function() {
    pm.expect(pm.response.json()).to.be.an('array');
    pm.expect(responseArray.length).to.eql(2);
});

pm.test("List with a specific name is present", function() {
    var listNames = pm.response.json().map((list) => list.name);
    pm.expect(listNames).to.include(pm.variables.get("uniqueListName"));
});
```

7. Create a Card in the TO DO List

So, what do we need here?

```
POST    {{baseURL}}/1//cards?key={{trelloKey}}&token={{trelloToken}}&name=Sign-up for Trello&idList=65df511ed5d3dde1f8b95c78
```

First, we need the id of the TO DO list and maybe, if you want to practice creating unique names each time you create a card, you could do that, but it's up to you. We'll not showing it again. You have the information needed in the previous requests. So, we'll create "Sign-up for Trello" card each time.

- **So, TO DO list id, we head back to "Create TO DO List" request and add the following script into the Tests tab:**

```
var listId = jsonData.id;
pm.collectionVariables.set("todoListId", listId);
```

- **Then we use the variable as a query parameter in Create a Card in the TO DO List**

```
POST    {{baseURL}}/1//cards?key={{trelloKey}}&token={{trelloToken}}&name=Sign-up for Trello&idList={{todoListId}}
```

- We will need the **id of the card in the next two requests**, so it is advisable to write a script to get the id.

Since all of the boards, cards, lists have id, be really careful about the names of your variables in order not to duplicate it. Call this one **{{cardId}}.** The script should be placed in the Tests tab.

```
var responseData = pm.response.json();
var cardId = responseData.id;

pm.collectionVariables.set("cardId", cardId);
```

- Write some asserts here. What can you assert? Many things in the response. **Be creative!**

```
pm.test("Card name is correct", function() {
    pm.expect(responseData.name).to.equal("Sign-up for Trello");
});

pm.test("Labels and attachments are empty", function() {
    pm.expect(responseData.labels).to.be.empty;
    pm.expect(responseData.attachments).to.be.empty;
});
```

8. Move Card to List with Unique Name (ex-DONE list)

You need to **replace the {id}** with the **{{cardId}}**. And also **replace**, the **hardcoded value** of the **query parameter idList**. Where can you get this one? You already have it. We took it when we created **List with Unique Name**

```
PUT    {{baseURL}}/1//cards/{{cardId}}?key={{trelloKey}}&token={{trelloToken}}&idList={{uniqueListId}}
```

- **Assert that the card is moved**

```
const responseData = pm.response.json();

pm.test("Card ID is correct", function() {
pm.expect(responseData.id).to.eql(pm.variables.get("cardId"));
});

pm.test("Card is moved to the new list", function() {
    pm.expect(responseData.idList).to.eql(pm.variables.get("uniqueListId"));
});
```

9. Delete Card

Same here. Replace the **{{id}}** with the **{{cardId}}**

```
DELETE    https://api.trello.com/1/cards/{{cardId}}?key={{trelloKey}}&token={{trelloToken}}
```

The response here is:

```
{
    "limits": {}
}
```

What can you assert?

```
var responseData = pm.response.json(); // Parse the response body as JSON

pm.test("'limits' property exists and is an object", function() {
pm.expect(responseData).to.have.property('limits'); // Check if the 'limits' property exists
    pm.expect(responseData.limits).to.be.an('object'); // Check if 'limits' is an object
});

pm.test("'limits' object is empty", function() {
pm.expect(Object.keys(responseData.limits)).to.have.lengthOf(0); // Check if 'limits' object is empty
});
```

10. Delete Board

You need the board id for this one.

The response is:

```
{
    "_value": null
}
```

- **Assert that it is null.**

```
const responseData = pm.response.json(); // Parse the response body as JSON

pm.test("Response '_value' is null", function() {
pm.expect(responseData._value).to.be.null; // Assert that '_value' is null
});
```

8. Running all the tests

At this point we advise you to go to your Trello.com board and clear everything that might prevent you from observing the results of each request. Close any boards that may have been left open from the creation of requests and tests.

Run each test one by one. Make sure that each pass. After you've run all the tests, you should see your Trello workspace looking just like it did at the start. This is because our first request creates a board, and our final request deletes that same board.

In the next exercise, we will proceed with automation...