Rest Services

HTTP, RESTful Web Services, HTTP and REST Tools: Postman, Fiddler

SoftUni Team

Technical Trainers

Software University

http://softuni.bg

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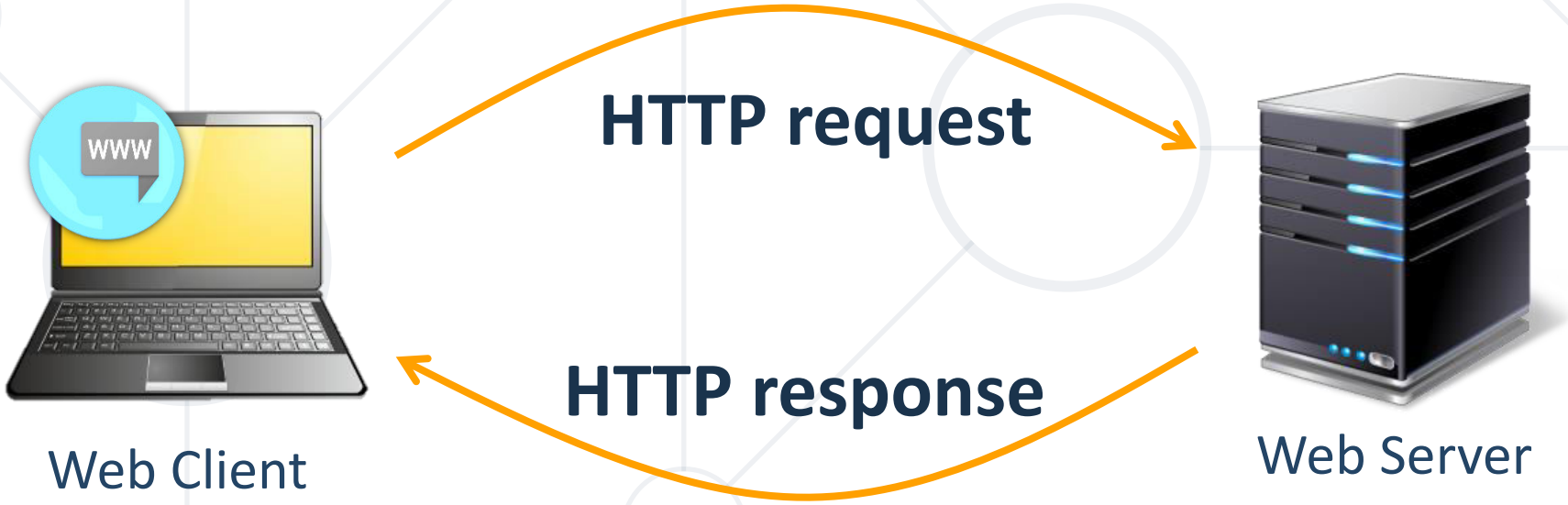
#JSCORE

HTTP Basics

- HTTP (**H**yper **T**ext **T**ransfer **P**rotocol)
  - Text-based client-server protocol for the Internet
  - For transferring Web resources (HTML files, images, styles, etc.)
  - Request-response based



HTTP Request Methods

- **HTTP** defines **methods** to indicate the desired action to be performed on the identified resource

Method	Description
GET 	Retrieve / load a resource
POST 	Create / store a resource
PUT 	Update a resource
DELETE 	Delete (remove) a resource
PATCH 	Update resource partially
HEAD 	Retrieve the resource's headers

HTTP GET Request – Example

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```
GET /users/testnakov/repos HTTP/1.1
Host: api.github.com
Accept: */*
Accept-Language: en
Accept-Encoding: gzip, deflate
User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/
537.36 (KHTML, like Gecko) Chrome/54.0.2840.71 Safari/537.36
Connection: Keep-Alive
Cache-Control: no-cache
<CRLF>
```

HTTP request line

HTTP headers

The request body is empty

HTTP POST Request – Example

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```
POST /repos/testnakov/test-nakov-repo/issues HTTP/1.1
Host: api.github.com
Accept: */*
Accept-Language: en
Accept-Encoding: gzip, deflate
User-Agent: Mozilla/4.0 (compatible;MSIE 6.0; Windows NT 5.0)
Connection: Keep-Alive
Cache-Control: no-cache
<CRLF>
{"title":"Found a bug",
 "body":"I'm having a problem with this.",
 "labels":["bug","minor"]}
<CRLF>
```

HTTP request line

HTTP headers

The request body holds the submitted data

HTTP Response – Example

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```
HTTP/1.1 200 OK
Date: Fri, 11 Nov 2016 16:09:18 GMT+2
Server: Apache/2.2.14 (Linux)
Accept-Ranges: bytes
Content-Length: 84
Content-Type: text/html
<CRLF>
<html>
  <head><title>Test</title></head>
  <body>Test HTML page.</body>
</html>
```

HTTP response status line

HTTP response headers

HTTP response body

HTTP Response Status Codes

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Status Code	Action	Description
200	OK	Successfully retrieved resource
201	Created	A new resource was created
204	No Content	Request has nothing to return
301 / 302	Moved	Moved to another location (redirect)
400	Bad Request	Invalid request / syntax error
401 / 403	Unauthorized	Authentication failed / Access denied
404	Not Found	Invalid resource
409	Conflict	Conflict was detected, e.g. duplicated email
500 / 503	Server Error	Internal server error / Service unavailable

Content-Type and Disposition

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- The **Content-Type / Content-Disposition** headers specify how the HTTP request / response body should be processed
- Examples:

JSON-encoded data

```
Content-Type: application/json
```

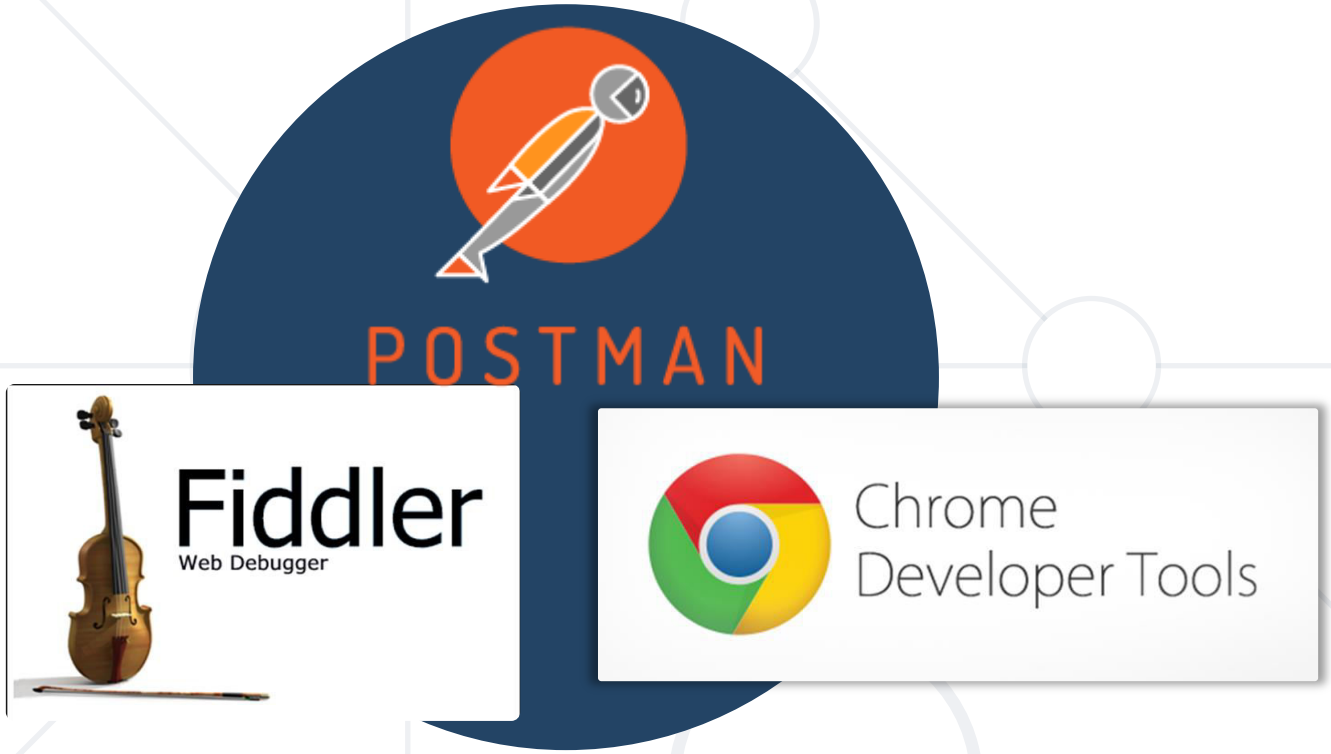
UTF-8 encoded HTML page. Will be shown in the browser

```
Content-Type: text/html; charset=utf-8
```

```
Content-Type: application/pdf

Content-Disposition: attachment; filename="Financial-Report-April-2016.pdf"
```

This will download a PDF file named **Financial-Report-April-2016.pdf**



HTTP Developer Tools

Chrome Dev Tools, Fiddler, Postman

Chrome Developer Tools

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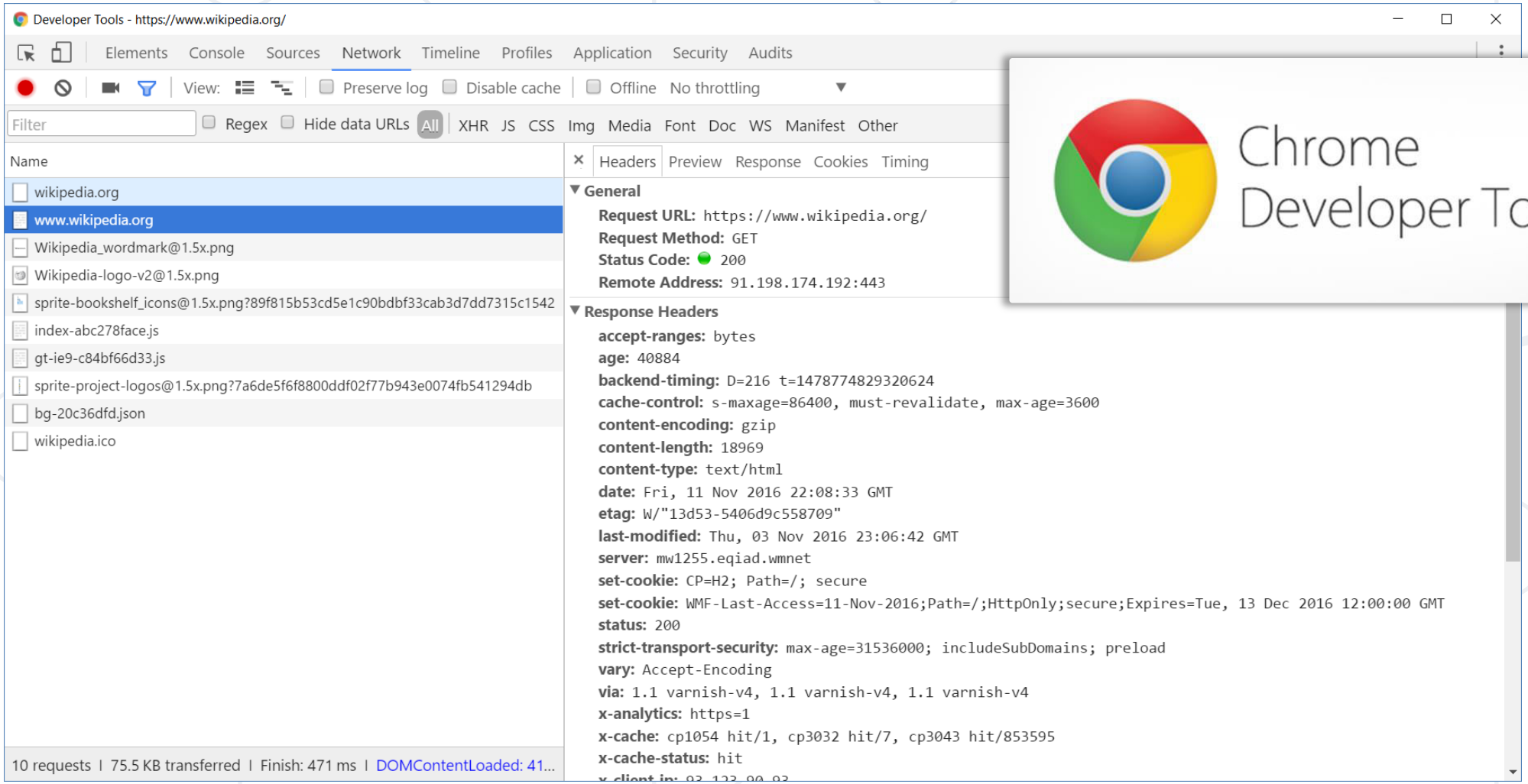

Chrome Developer Tools

Fiddler

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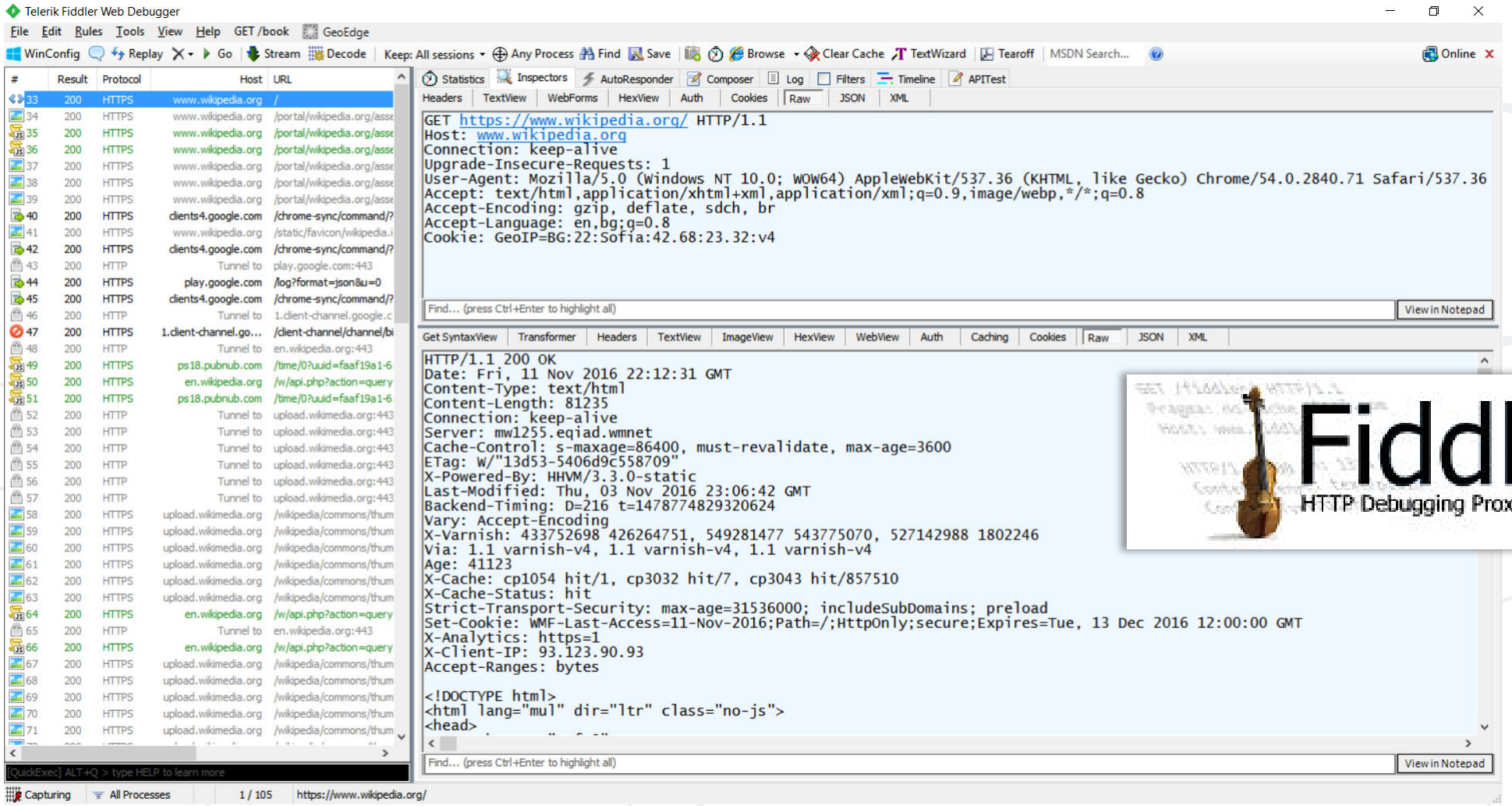

Fiddler

HTTP Tools for Developers

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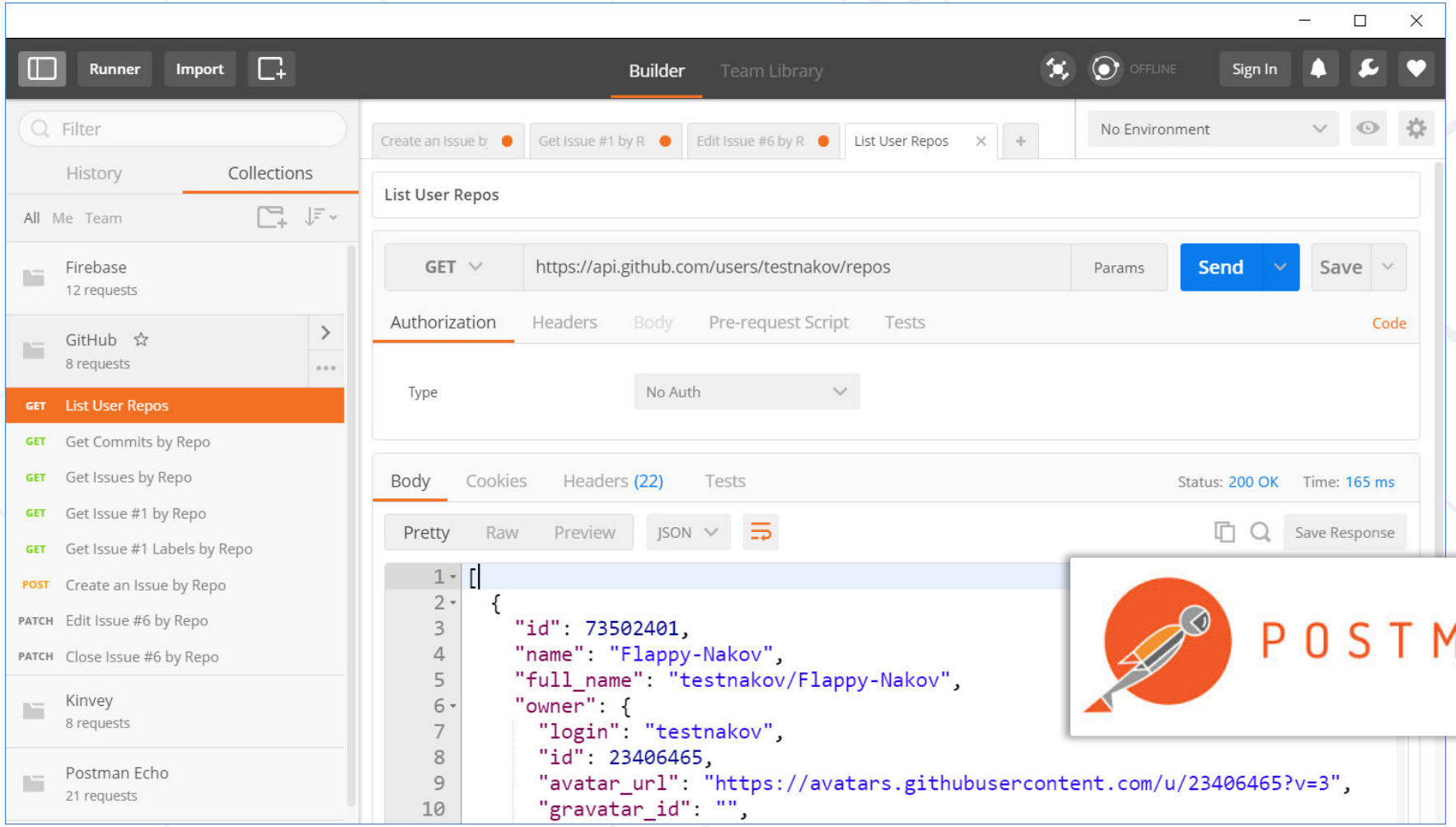

Postman REST Client

REST and RESTful Services

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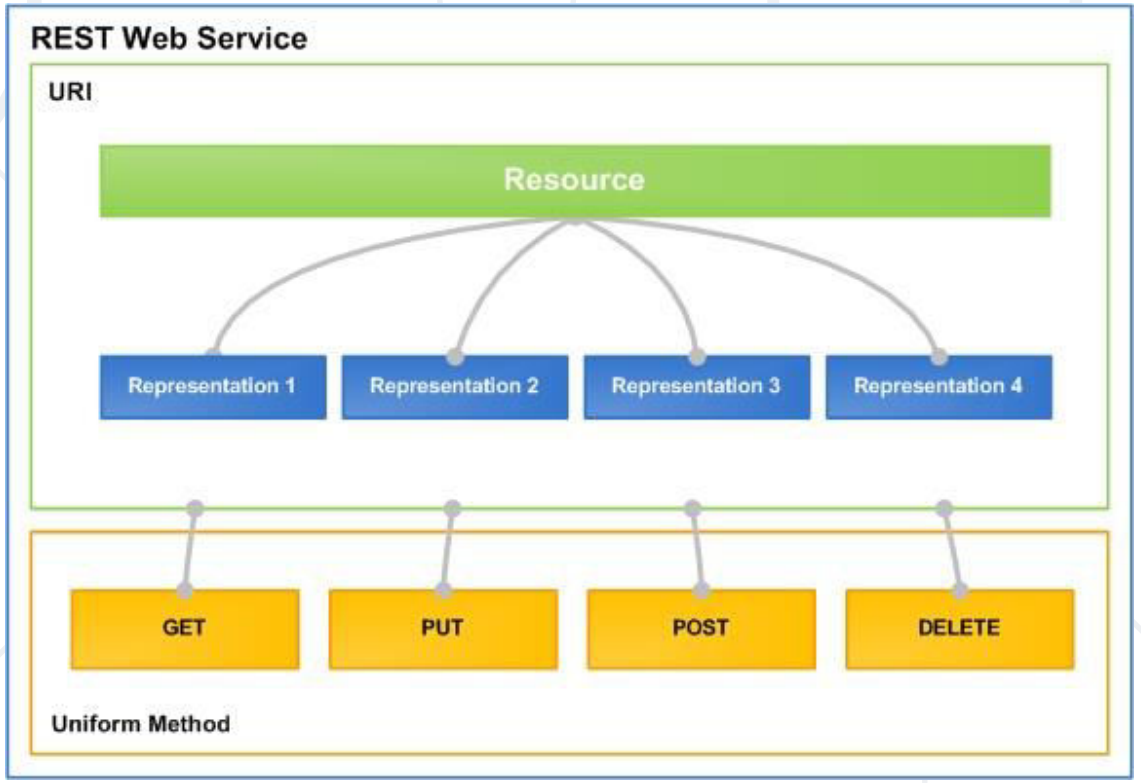
- Representational State Transfer (REST)
  - Architecture for client-server communication over HTTP
  - Resources have URI (address)
  - Can be created / retrieved / modified / deleted / etc.
- RESTful API / RESTful Service
  - Provides access to server-side resources via HTTP and REST



REST and RESTful Services – Example

- Create a new post
  - **POST** http://some-service.org/api/posts
- Get all posts / specific post
  - **GET** http://some-service.org/api/posts
  - **GET** http://some-service.org/api/posts/17
- Delete existing post
  - **DELETE** http://some-service.org/api/posts/17
- Replace / modify existing post
  - **PUT / PATCH** http://some-service.org/api/posts/17

GitHub REST API

Accessing GitHub through HTTP

GitHub API

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- List user's all public repositories:

GET	https://api.github.com/users/testnakov/repos

- Get all commits from a public repository:

GET	https://api.github.com/repos/testnakov/softuniada-2016/commits

- Get all issues / issue #1 from a public repository

GET	/repos/testnakov/test-nakov-repo/issues /repos/testnakov/test-nakov-repo/issues/1

Check your solution here: https://judge.softuni.bg/Contests/356

GitHub API (2)

- Get all labels for certain issue from a public repository:

GET	https://api.github.com/repos/testnakov/test-nakov-repo/issues/1/labels

- Create a new issue to certain repository (with authentication)

POST	https://api.github.com/repos/testnakov/test-nakov-repo/issues
Headers	Authorization: Basic base64(user:pass)
Body	{"title":"Found a bug", "body": "I'm having a problem with this."}

Check your solution here: https://judge.softuni.bg/Contests/356

Submitting Problems to the Judge

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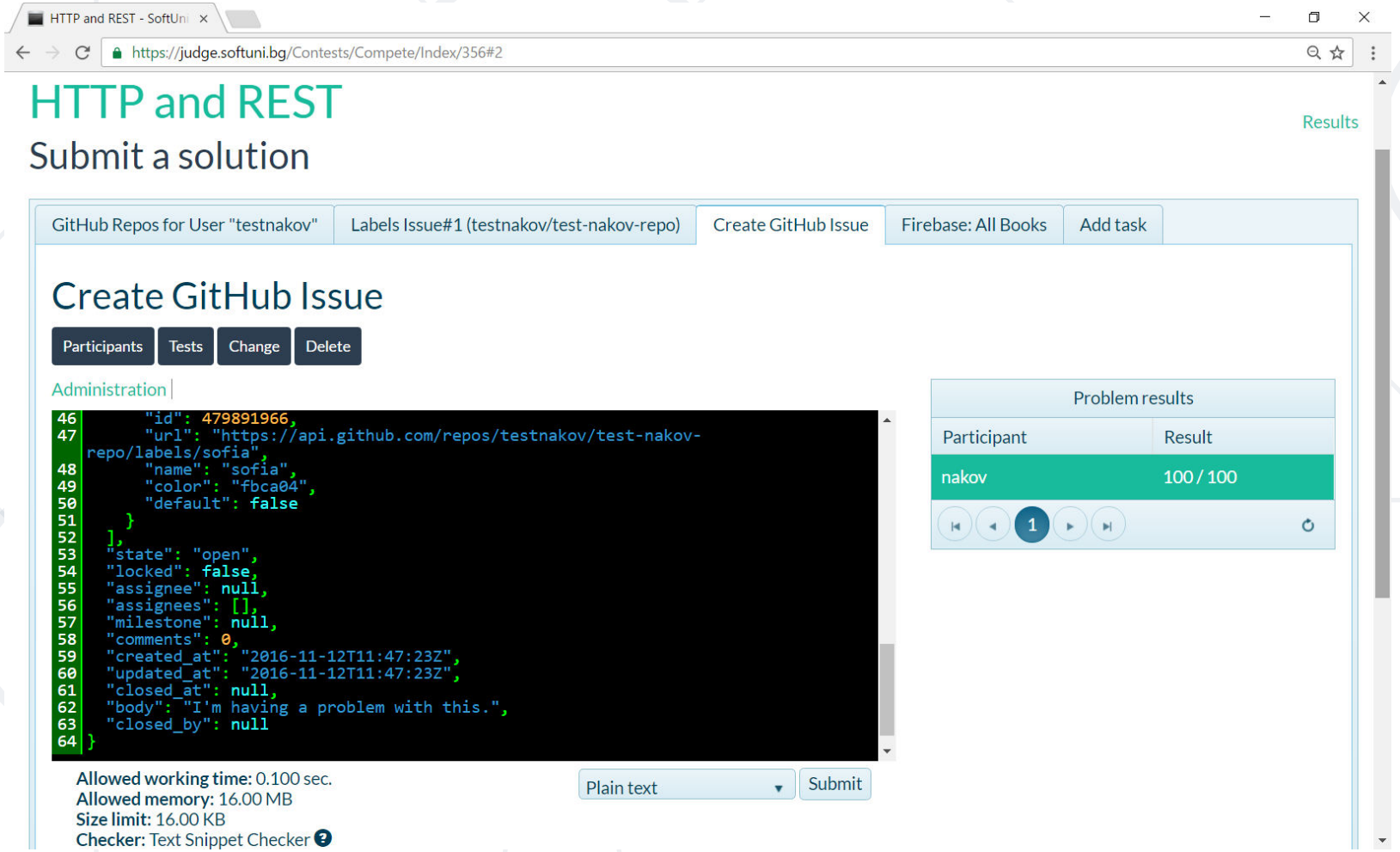
- Submit the result of your request (the returned HTTP response)



Firebase

Real-Time Cloud DB and App Platform by Google

Firebase

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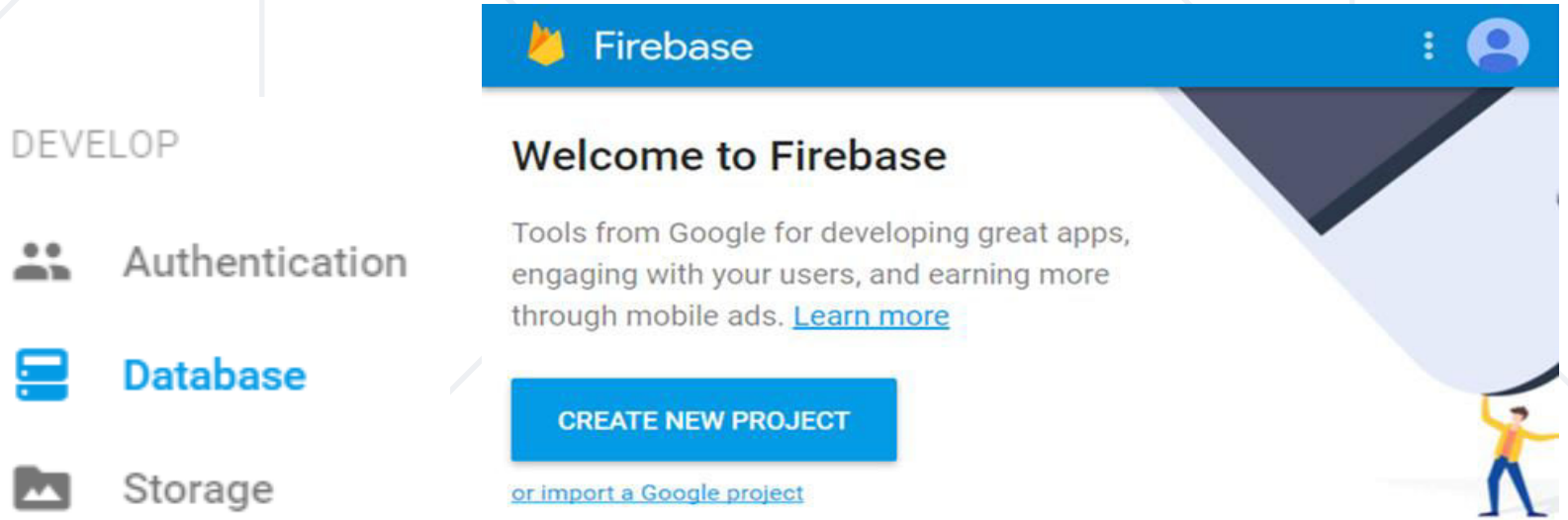
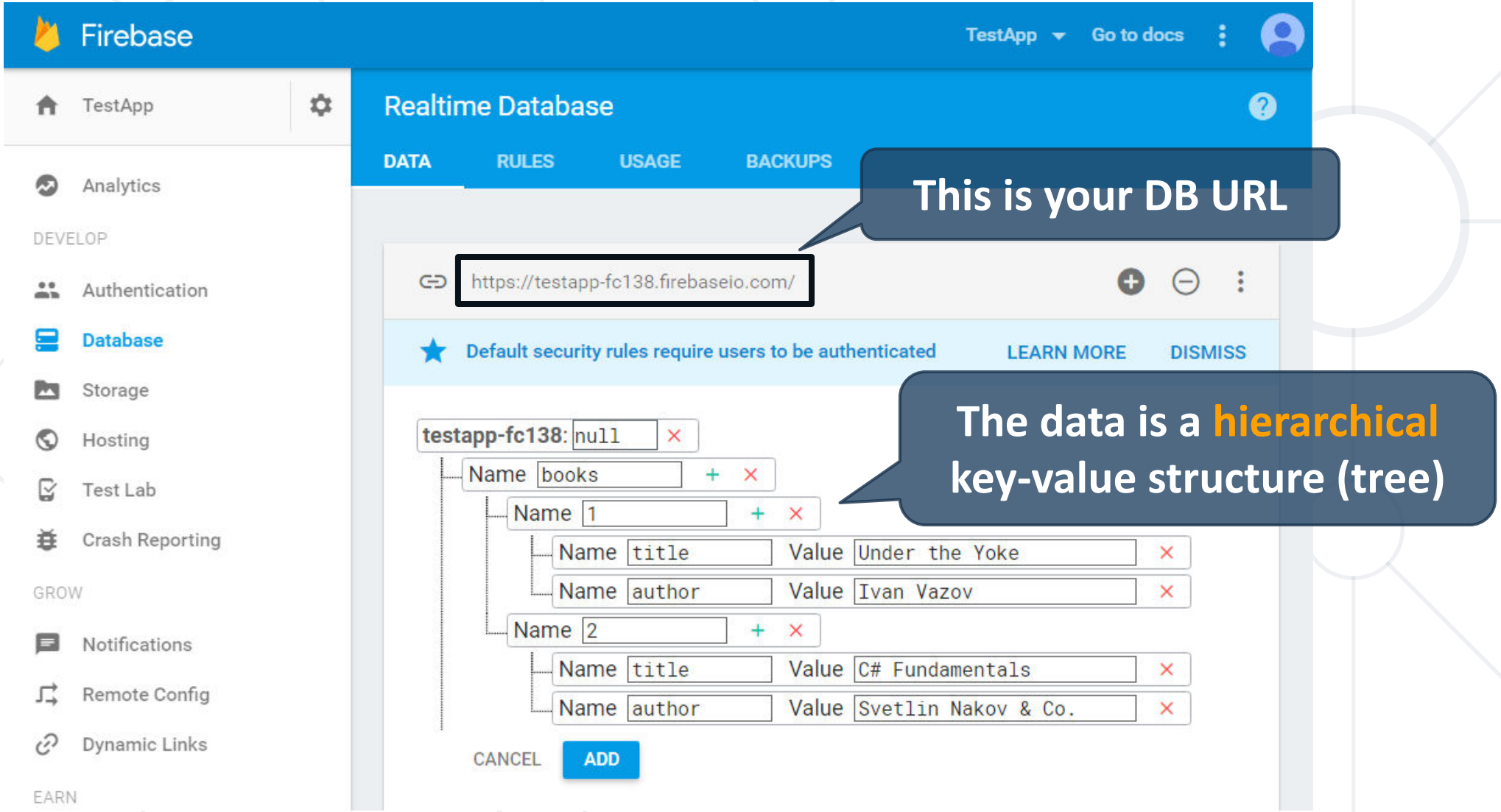
- Firebase is a cloud-based DB, storage and app platform (BaaS)
  - REST API, JSON-based document DB, free and paid plans
- Register at https://console.firebase.google.com
- Create a new project and play with it



Firebase – Put Some Data in the DB



Firebase REST API

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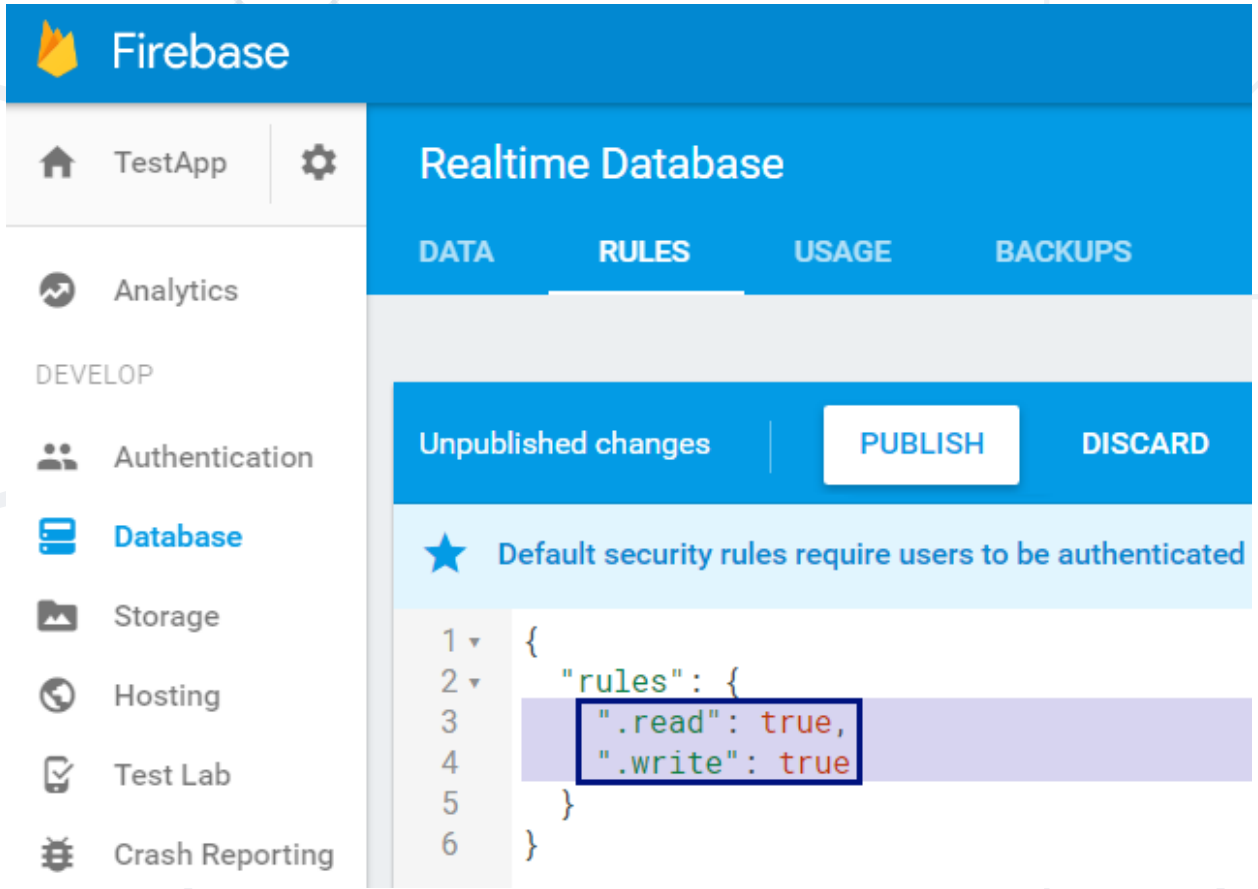
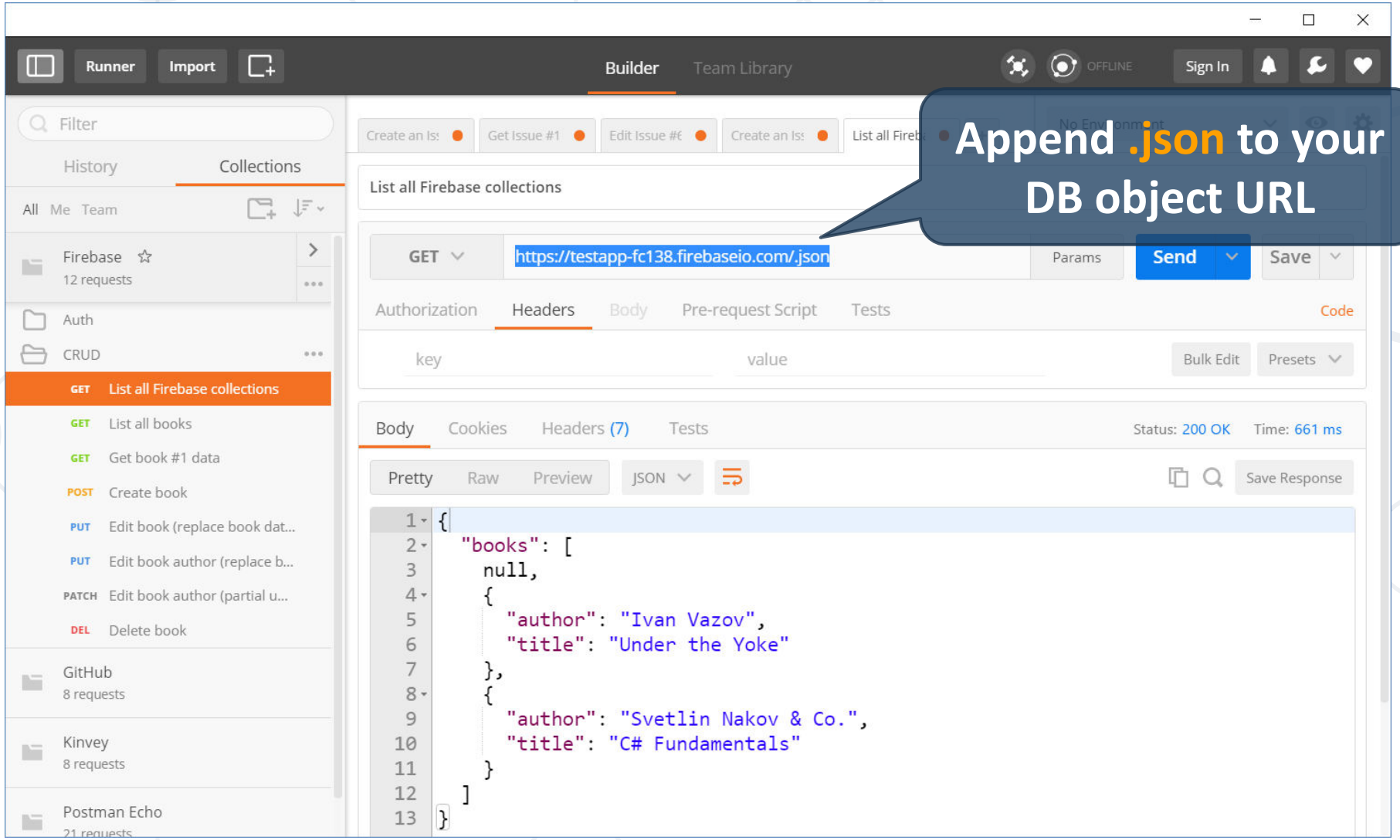
- Enable unauthorized access to your DB
  - For educational purposes only!
    - This is a security hole, don't do it in real apps
- Access your data through the REST API



GET	https://testapp-fc138.firebaseio.com/.json

Accessing Firebase REST API with Postman



Firebase REST API – CRUD Operations

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GET	https://testapp-fc138.firebaseio.com/.json
GET	https://testapp-fc138.firebaseio.com/books.json
GET	https://testapp-fc138.firebaseio.com/books/1.json
GET	https://testapp-fc138.firebaseio.com/books/1/author.json
POST	https://testapp-fc138.firebaseio.com/books.json
Body	{"title":"New title", "author":"New author"}
DELETE	https://testapp-fc138.firebaseio.com/books/6.json

Check your solution here: https://judge.softuni.bg/Contests/356

Firebase REST API – CRUD Operations (2)

PUT	https://testapp-fc138.firebaseio.com/books/7.json
Body	{"title":"Edited", "year":1980, "ISBN":"954X"}

PATCH	https://testapp-fc138.firebaseio.com/books/7.json
Body	{"year":1981, "author":"Author Changed"}

PUT	https://testapp-fc138.firebaseio.com/books/7/author.json
Body	"New author was assigned"

DELETE	https://testapp-fc138.firebaseio.com/books/7/author.json

Check your solution here: https://judge.softuni.bg/Contests/356

Kinvey

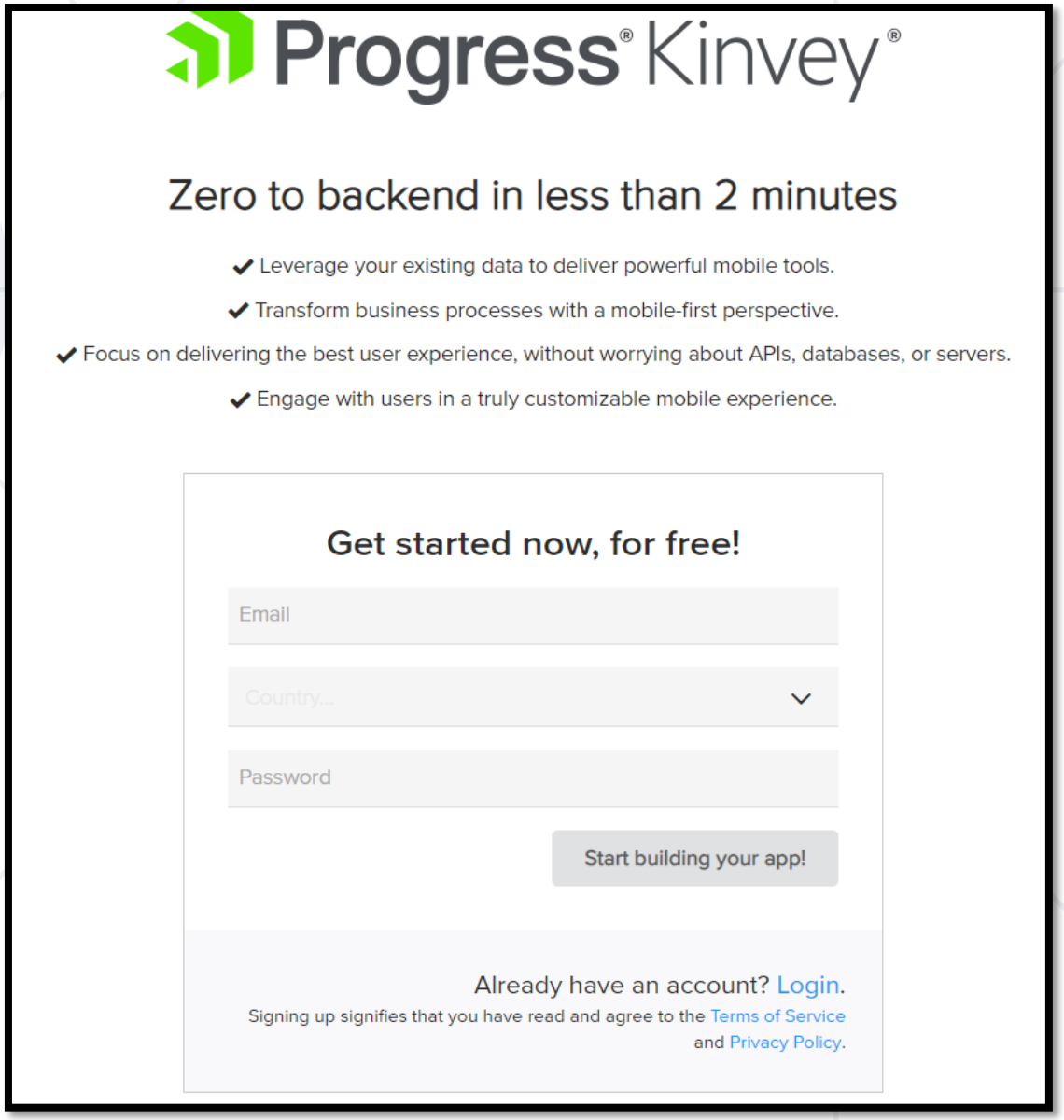
Collection-Based Cloud DB (mBaaS)

Kinvey as JS Back-End

- Kinvey is a Mobile Back-End as a Service (mBaaS)
  - Holds your app / mobile app data in the cloud
  - Anyone can register and create an app
- Kinvey apps hold users and user data
  - Users (API for creating an account)
  - Data collections (API for CRUD operations)
  - Files (upload / download / delete)

Kinvey: Registration

- Create a developer account in Kinvey
  - https://console.kinvey.com/signup



Kinvey: Create an App Backend

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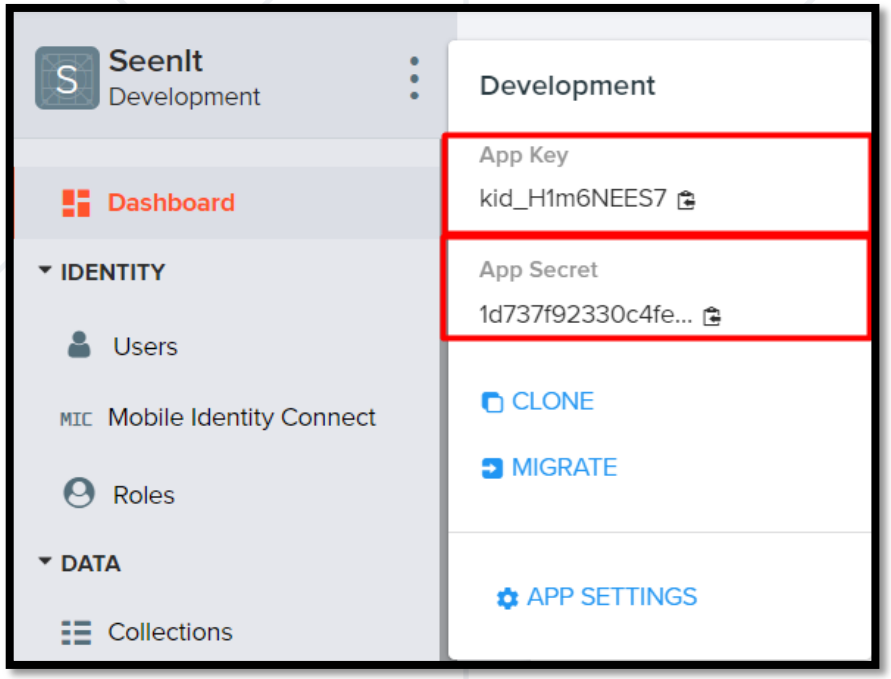
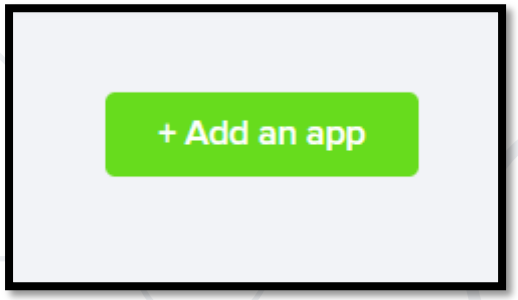
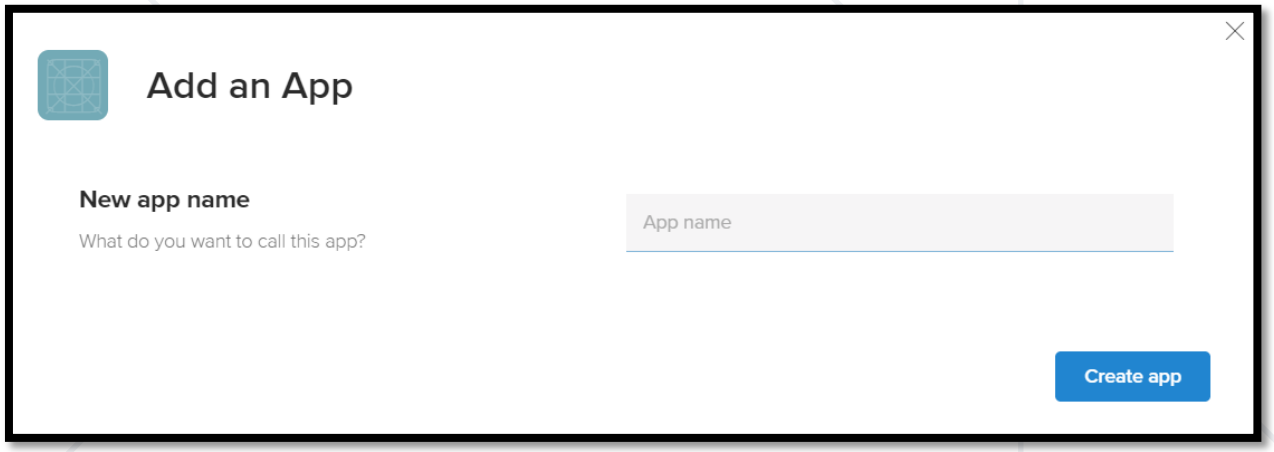
- Create an app backend

  (e.g. **MyTestApp**)
- You get App ID + App secret keys (account)

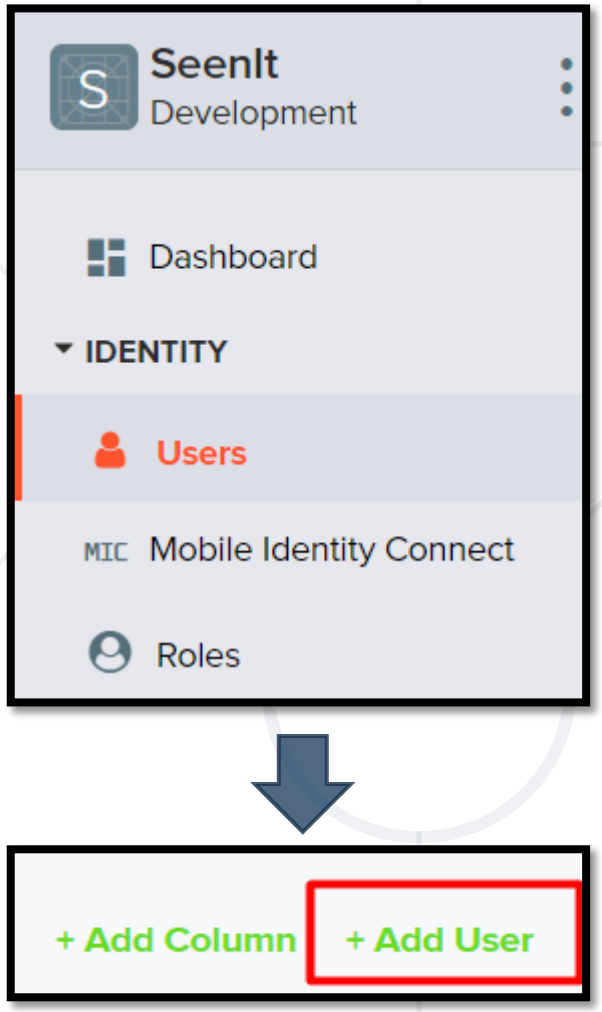


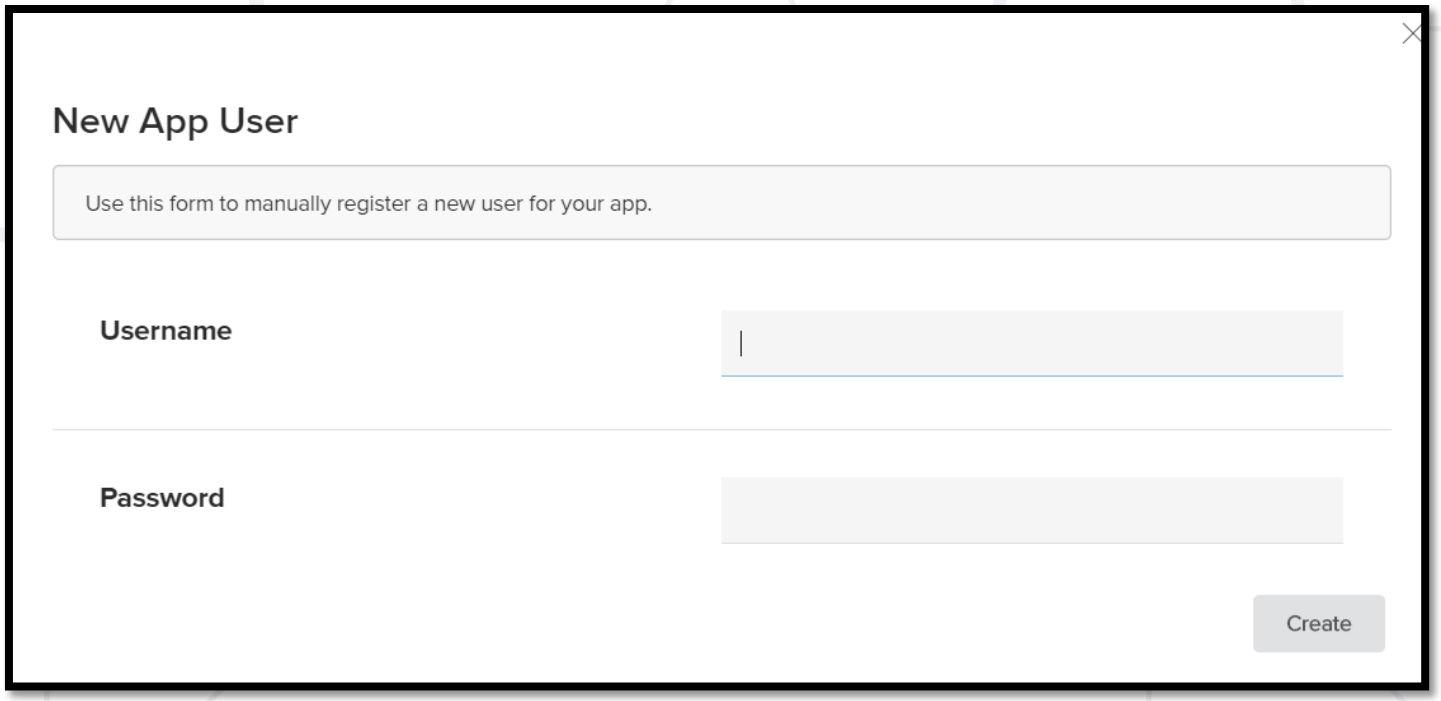




Kinvey: Create a User

- Create a user (e.g. **guest** / **guest**)





Kinvey: Create a Data Collection

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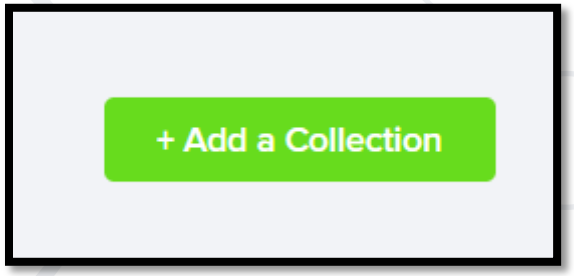
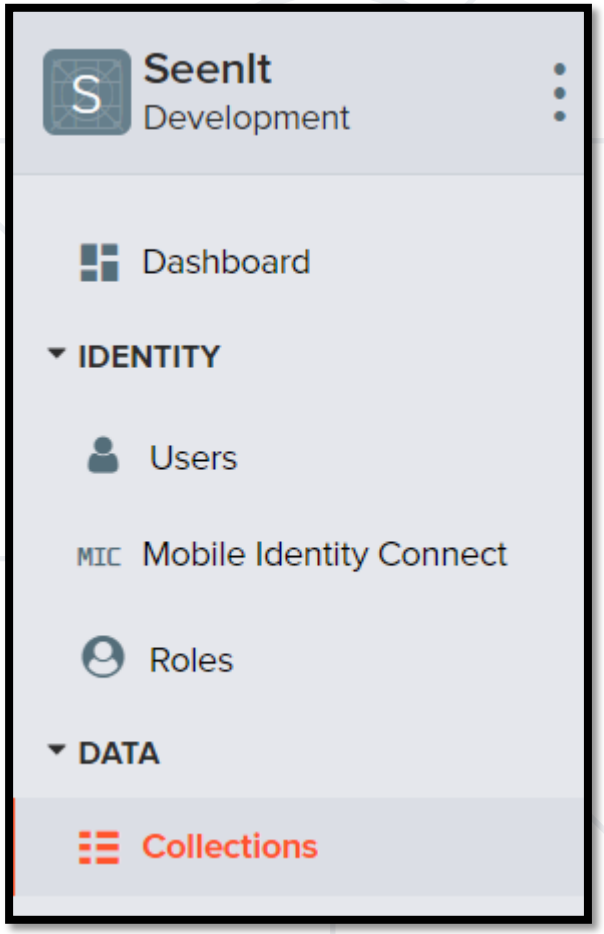
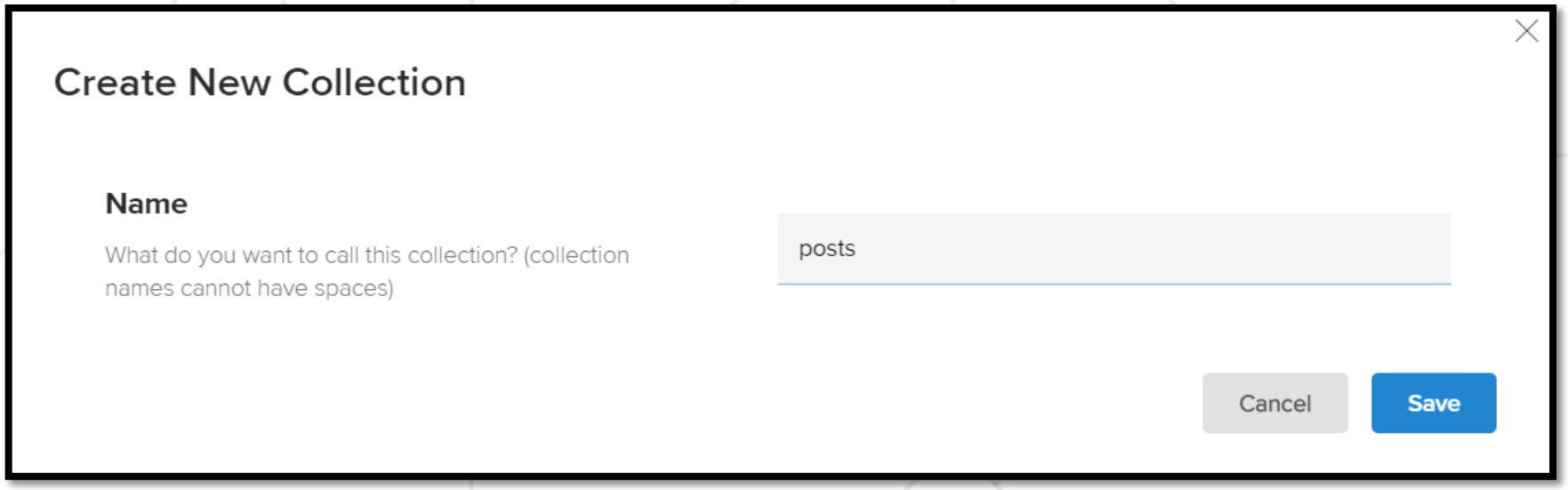
- Create a data collection (e.g. **posts**)

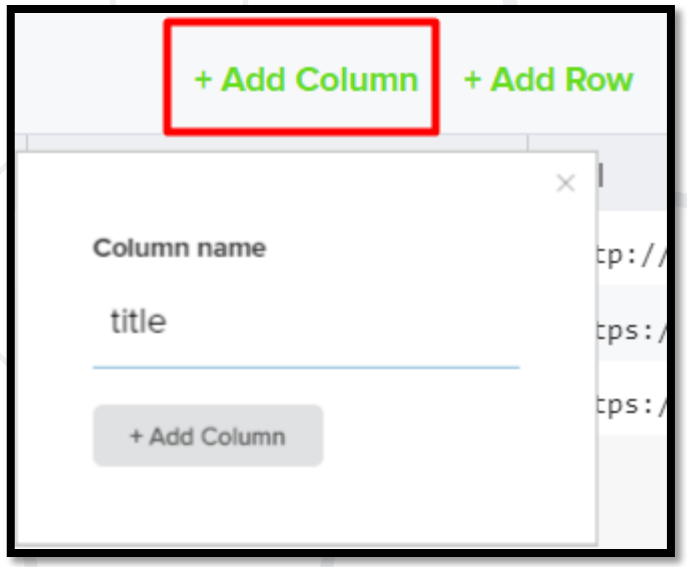


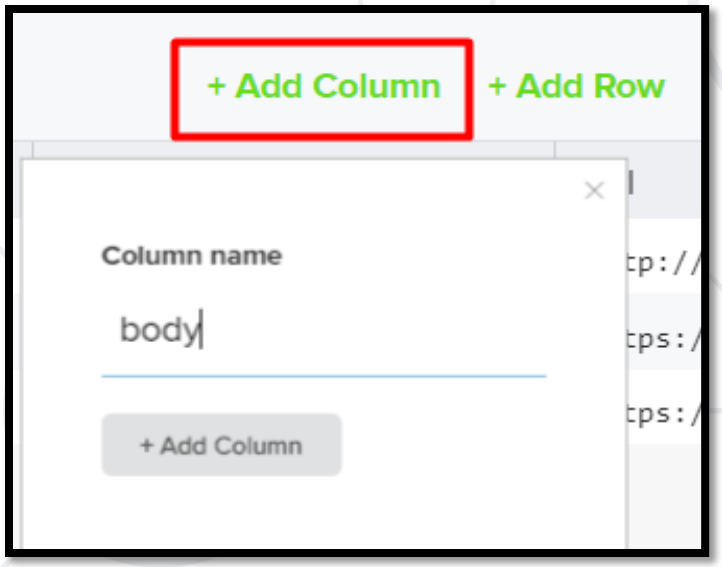




Kinvey: Create Data Columns

- Create some data columns for the **posts**, e.g. **title** and **body**

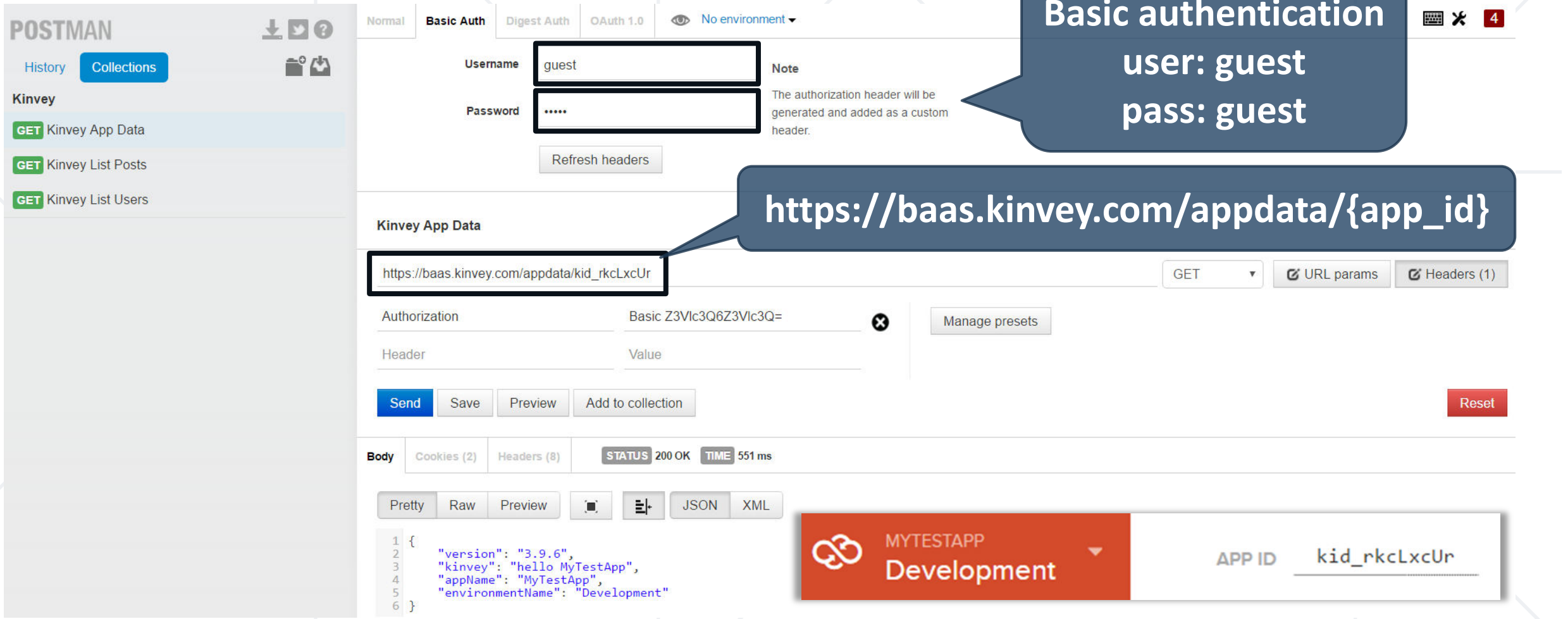




Kinvey: Create Data Rows

- Create some data rows for the **posts** collection

Test Your Backend with Postman



Check your solution here: https://judge.softuni.bg/Contests/356

Kinvey and Postman: List All Posts

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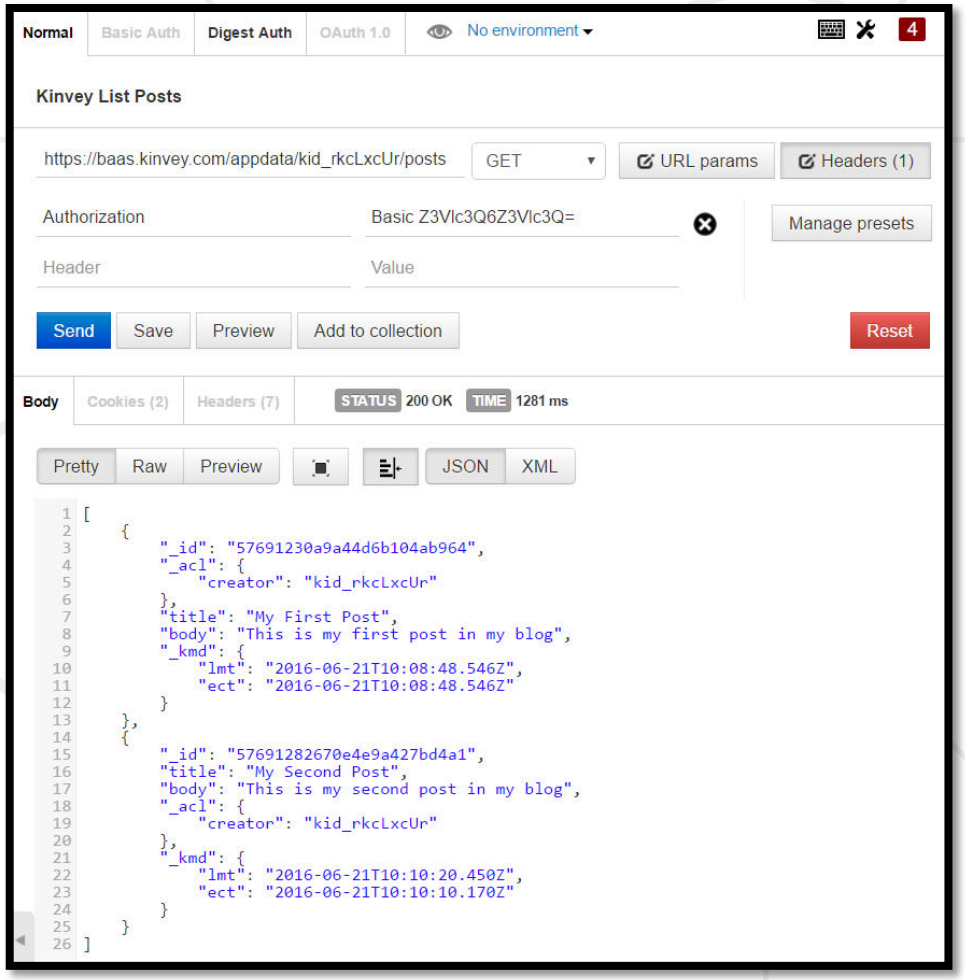
- URL: https://baas.kinvey.com/appdata/{app_id}/posts
- Method: **GET**
- Authentication: Basic
  - User: guest
  - Pass: guest



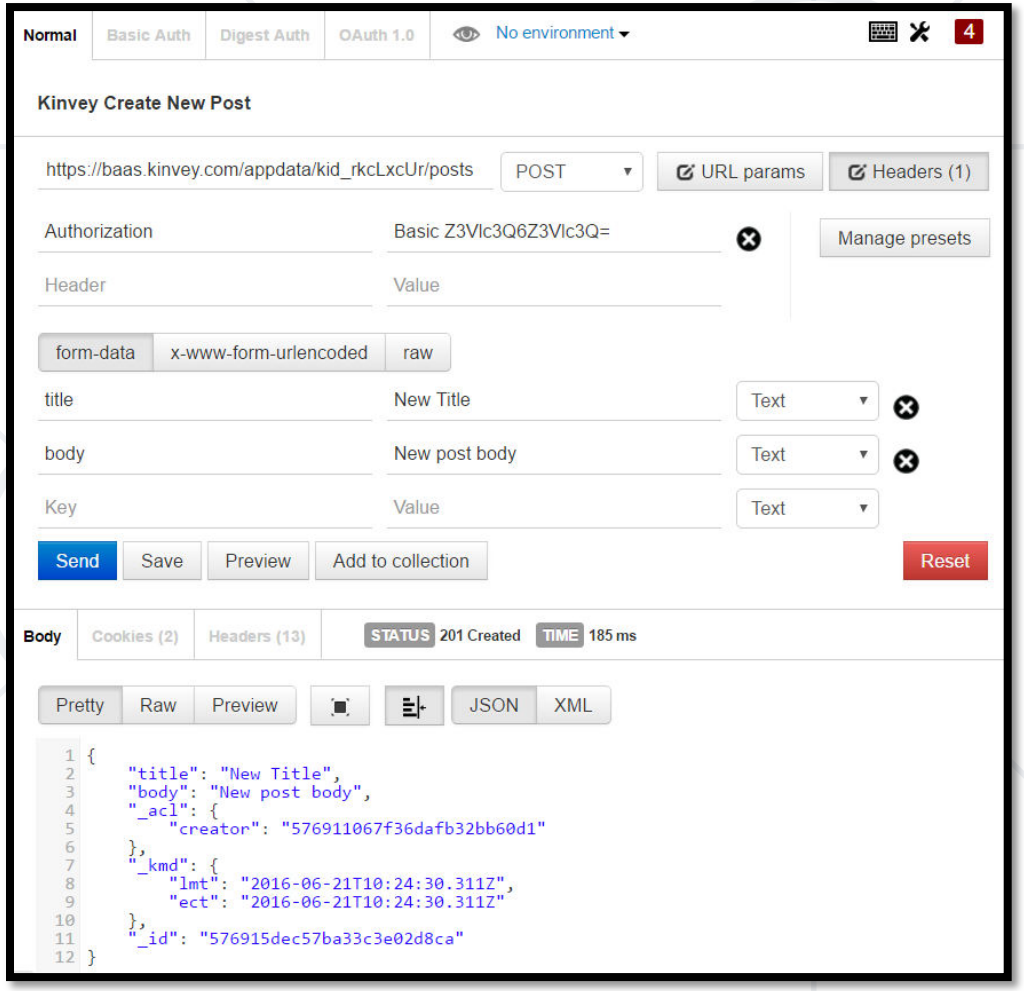
Check your solution here:
https://judge.softuni.bg/Contests/356

Kinvey and Postman: Create a New Post

SoftUni Foundation

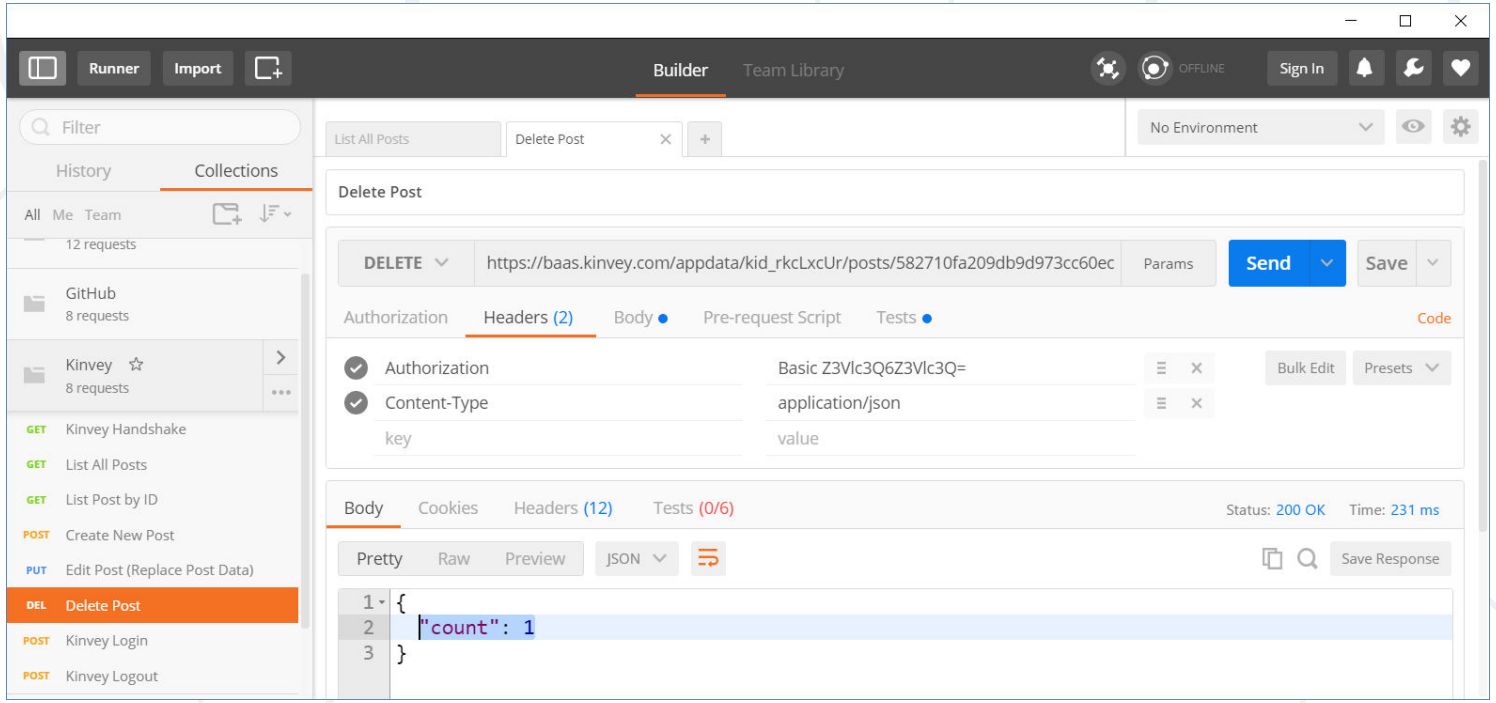
- URL: https://baas.kinvey.com/appdata/{app_id}/posts
- Method: **POST**
- Authentication: Basic
  - User / pass: guest / guest
- Request body
  - title: New Title
  - body: New Post Body

Check your solution here:
https://judge.softuni.bg/Contests/356



Kinvey and Postman: Delete an Existing Post

- URL: https://baas.kinvey.com/appdata/{app_id}/posts/id
  - Choose an existing post's ID
- Method: **DELETE**
- Authentication: Basic
  - User / pass: guest / guest
- Body: (empty)

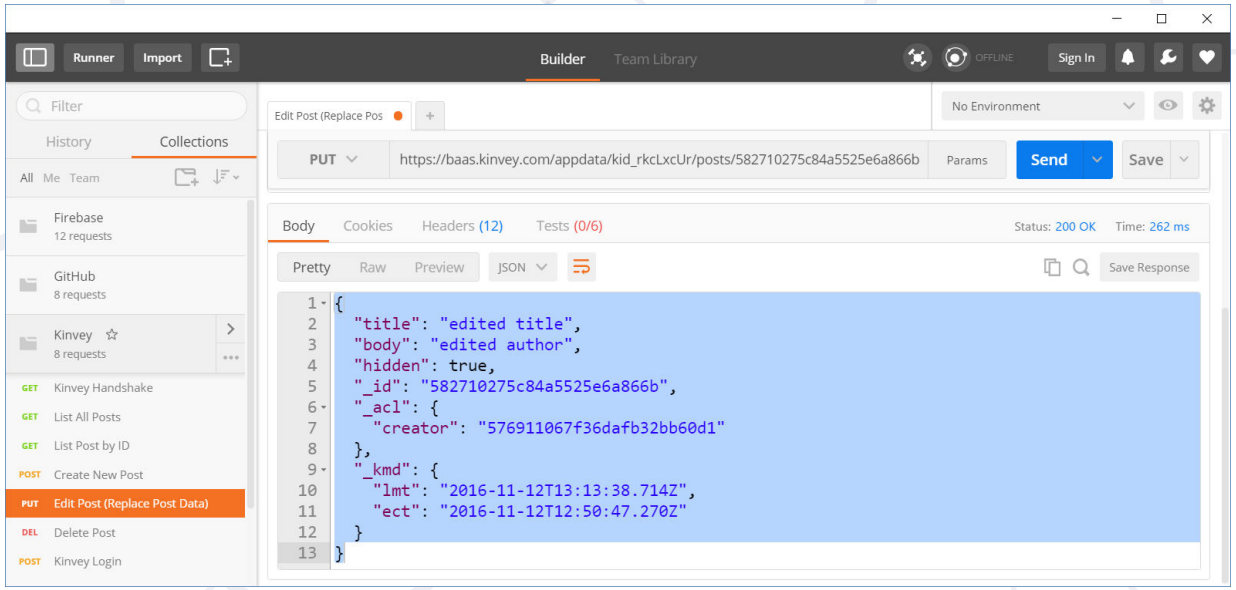


Check your solution here: https://judge.softuni.bg/Contests/356

Kinvey and Postman: Edit an Existing Post

SoftUni Foundation

- URL: https://baas.kinvey.com/appdata/{app_id}/posts/id
  - Choose an existing post's ID
- Method: **PUT**
- Authentication: Basic
  - User / pass: guest / guest
- Body (JSON):



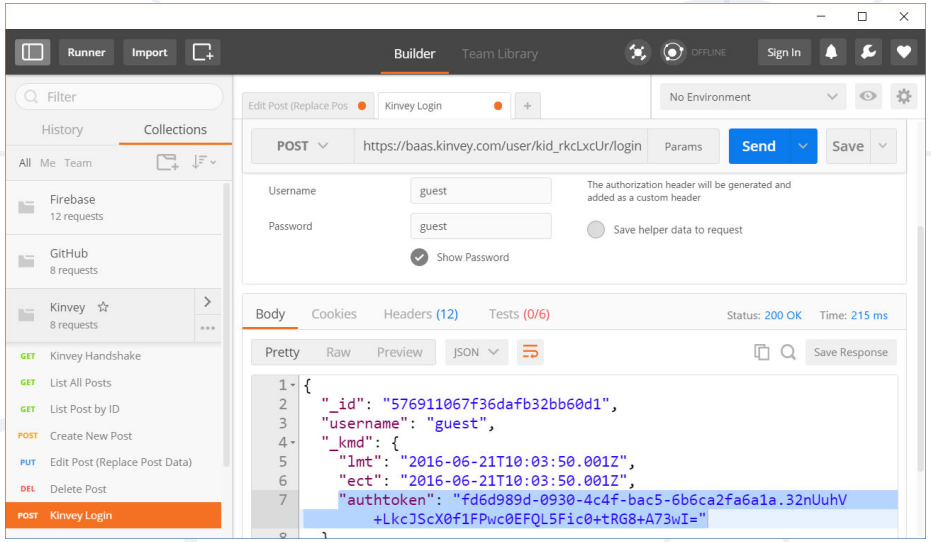

```
{"title":"edited title", "body":"edited author", "hidden":true}
```

Check your solution here: https://judge.softuni.bg/Contests/356

Kinvey and Postman: Login

- URL: https://baas.kinvey.com/user/{app_id}/login
- Method: **POST**
- Authentication: Basic
  - User / pass: **app_id : app_secret**
- Body:

```
{"username":"…", "password":"…"}
```

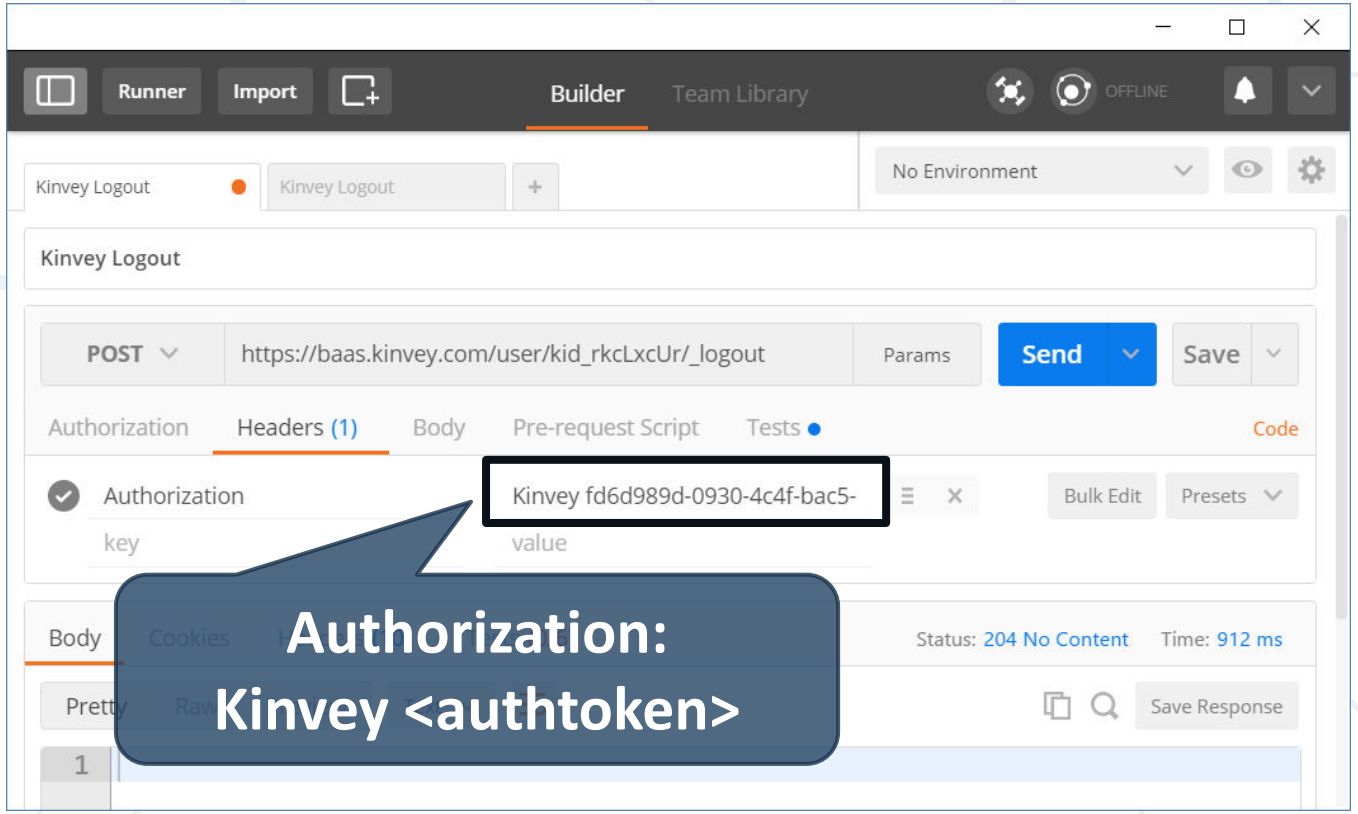


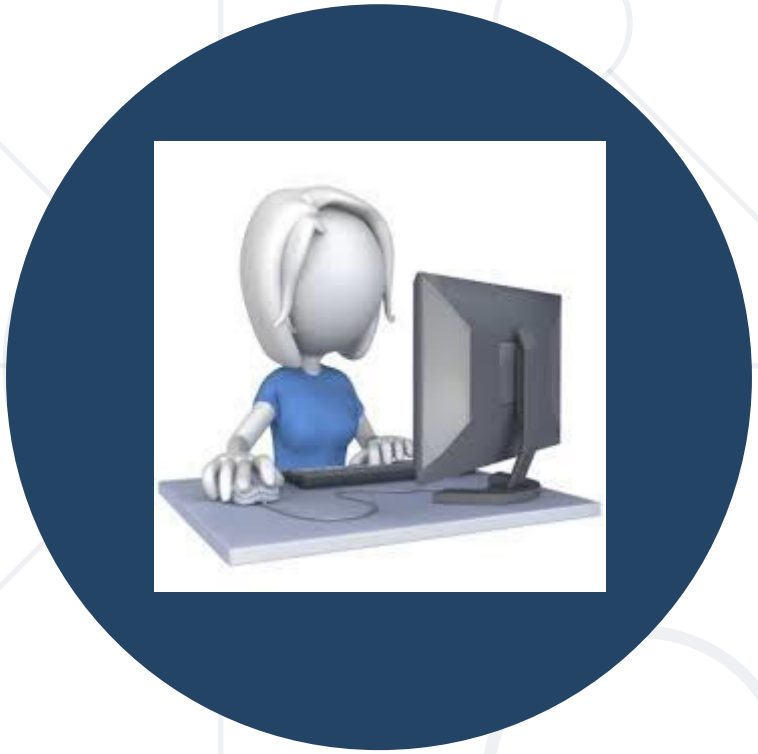
- Returns: **authtoken**, e.g. `"authtoken": "fd6d989d-0930-4c…wI="`

Check your solution here: https://judge.softuni.bg/Contests/356

Kinvey and Postman: Logout

- URL: https://baas.kinvey.com/user/{app_id}/_logout
- Method: **POST**
- Authorization:
  - **Kinvey <authtoken>**
  - Use the token given by the login request
- Returns:
  - **204 No Content**





Live Exercises in Class (Lab)

Practice: Accessing the REST API from GitHub, Firebase, Kinvey

Summary

SoftUni Foundation

- HTTP is text-based request-response protocol
  - REST uses GET, POST, PUT, PATCH, DELETE
- RESTful services address resources by URL
  - Provide CRUD operations over HTTP
- GitHub API provides access to users, organizations, repos, commits, issues, wikis, gist, pull requests, …

Summary (2)

- Firebase is JSON-based cloud database (mBaaS) with REST API
- Kinvey is collection-based could database (mBaaS)

Questions?

SoftUni

Software University

SoftUni Svetlina

SoftUni Creative

SoftUni Digital

SoftUni Foundation

SoftUni Kids

SoftUni Diamond Partners

SoftUni Foundation

XSsoftware

SBTech

telenor

SoftwareGroup
doing it right

NETPEAK

SmartIT

SUPER HOSTING .BG

INDEAVR
Serving the high achievers

INFRAGISTICS®

LIEBHERR

æternity

codeXio

SoftUni Organizational Partners

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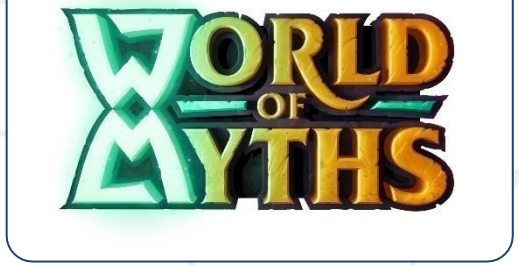

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