Web Development III

Block: V

Prepared By: Soniya Suthar

Block: V - Agenda

- Introduction to API
- Types of API
- How API works
- Simple RESTful API with PHP and MySQL

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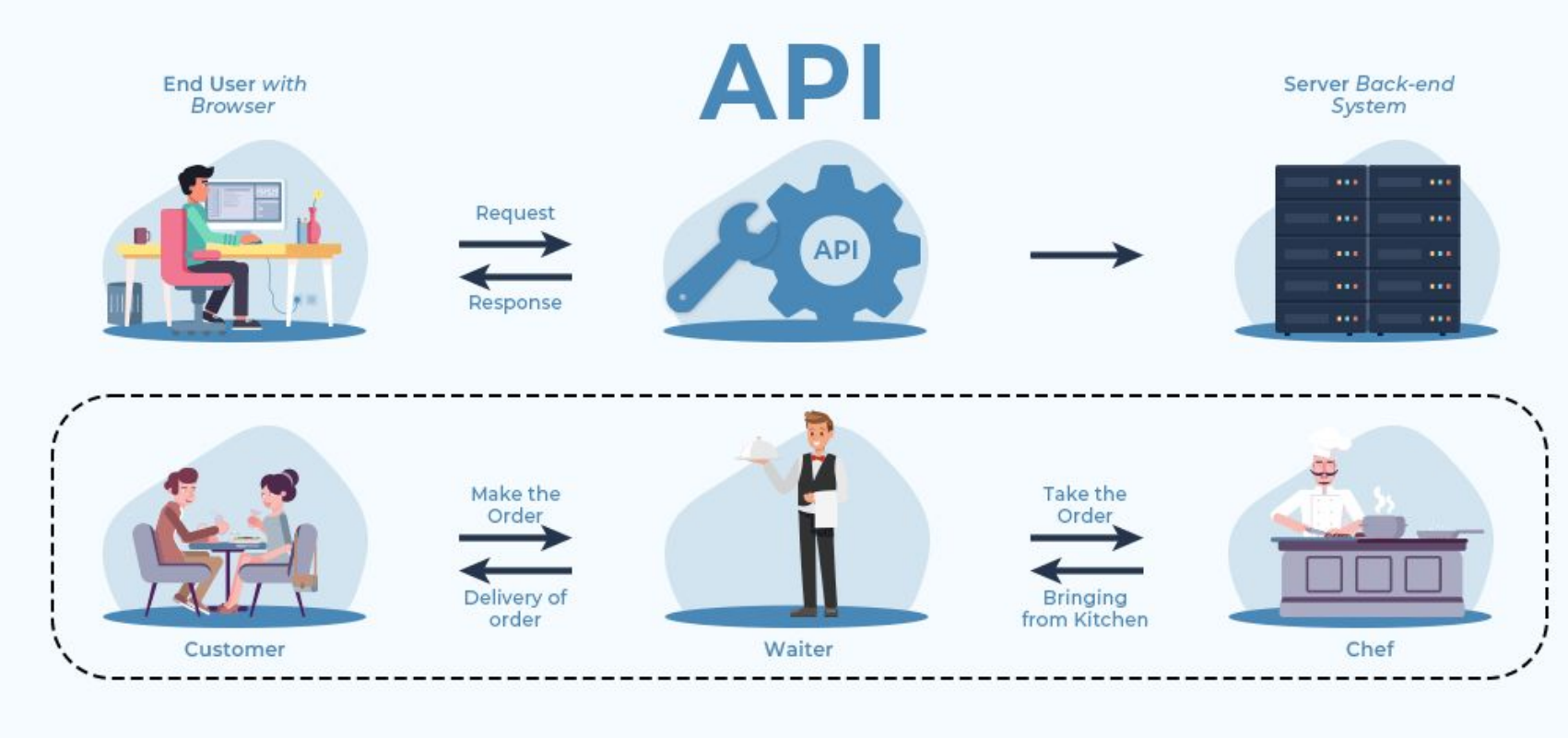
Introduction to API



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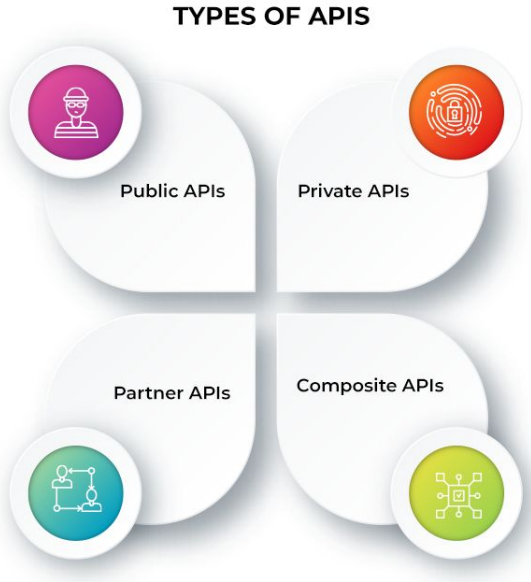
Introduction to API

- API stands for Application Programming Interface, is a set of defined rules that enable different applications to communicate with each other.
- An API defines how a developer should request services from an operating system (OS) or other application, and expose data within different contexts and across multiple channels.
- APIs let your product or service communicate with other products and services without having to know how they're implemented.
- This can simplify app development, saving time and money. When you're designing new tools and products—or managing existing ones—APIs give you flexibility; simplify design, administration, and use; and provide opportunities for innovation.

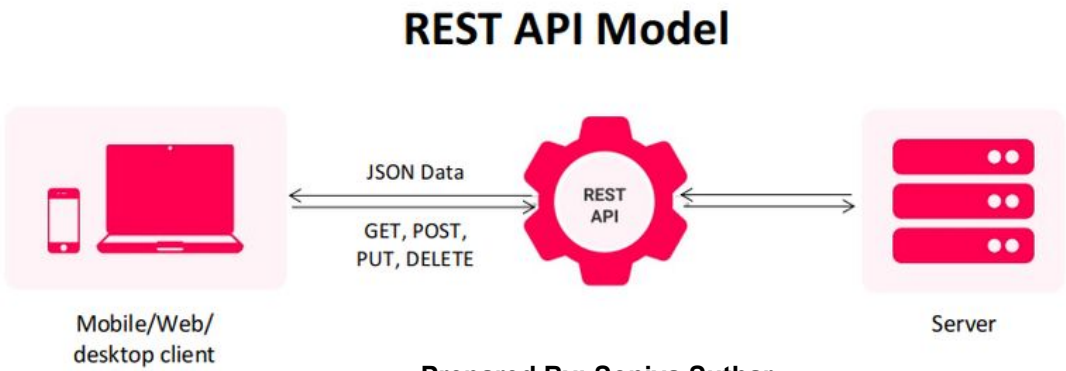
- Types of Web APIs: Web APIs are those which are accessible over the internet.
  - Open APIs: These APIs are publicly available as there is no restrictions.
  - Partner APIs: The user needs license and special rights to access this type of APIs.
  - Private APIs: Owned by companies for internal systems.
  - Composite APIs: It's a combination of data and service APIs for speeding up the execution process.



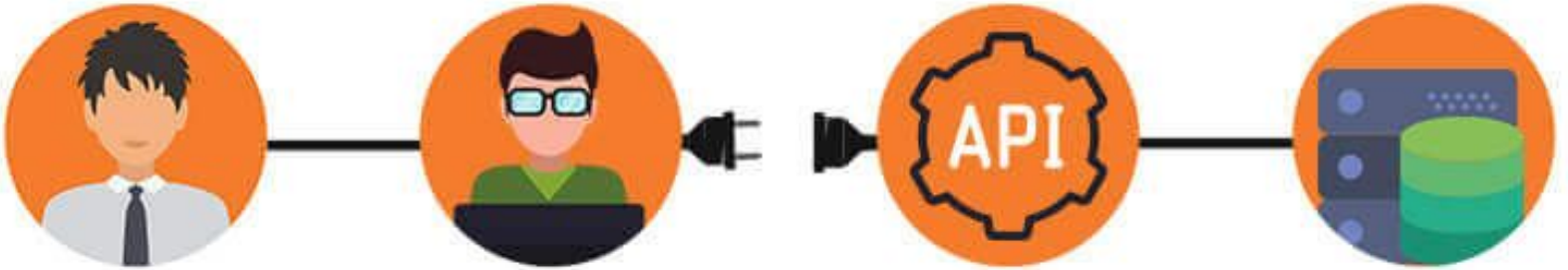
Types of API

- SOAP: Simple Object Access Protocol which uses web service definition language or XML for data transfer. It is very robust. These are used in integrating APIs.
- JSON: For data transfer it uses JSON.
- REST: The set of rules includes some standard architectural principles for data exchange. For making a request, it uses HTTP methods of getting, PUT, POST, GET, DELETE for all CRUD operations. It consumes less bandwidths and also comfortable accessing cloud services.

- REST output is in the form of JSON:
  - GET: Read or retrieves information.
  - POST: Creates new record.
  - PUT: Update a record.
  - DELETE: Deletes a record.



Working of API



End User

End user, i.e, you will get all the required information on your app screen.

Developers

Developers will design the app such that it could access the data stored in databases/assets via APIs.

API

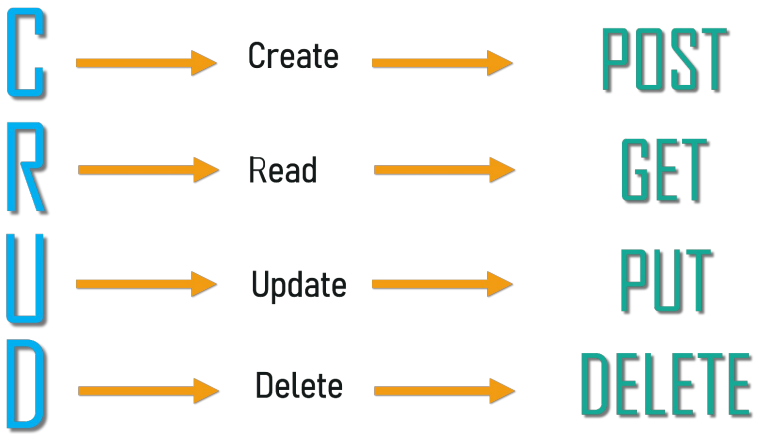
API will connect with assets/databases to access required information/data and send to the app.

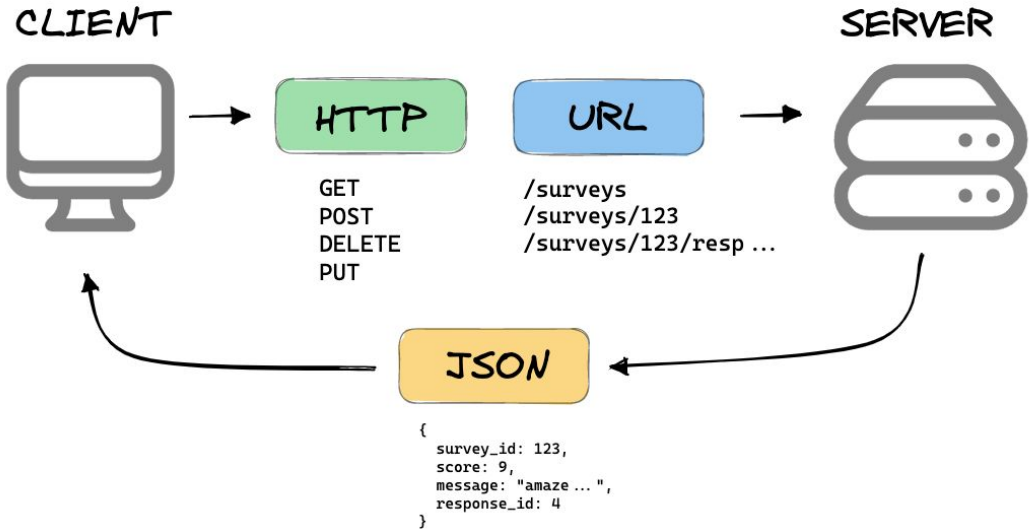
Assets (Database)

The data and software of the other brands will be used for offering third-party services.

Simple RESTful API with PHP and MySQL

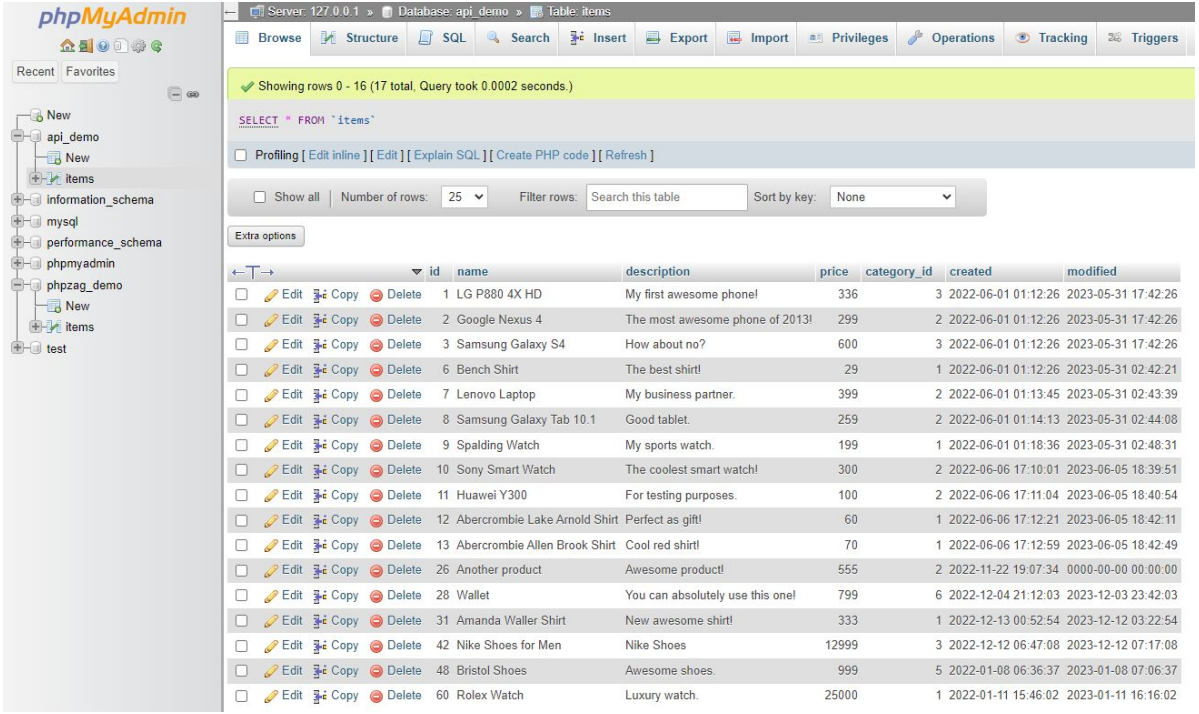
- Create database table
- Connect database
- Create a file for REST API
  - Crate
  - Read
  - Update
  - Delete
- Check Endpoint in REST-Client (POSTMAN)





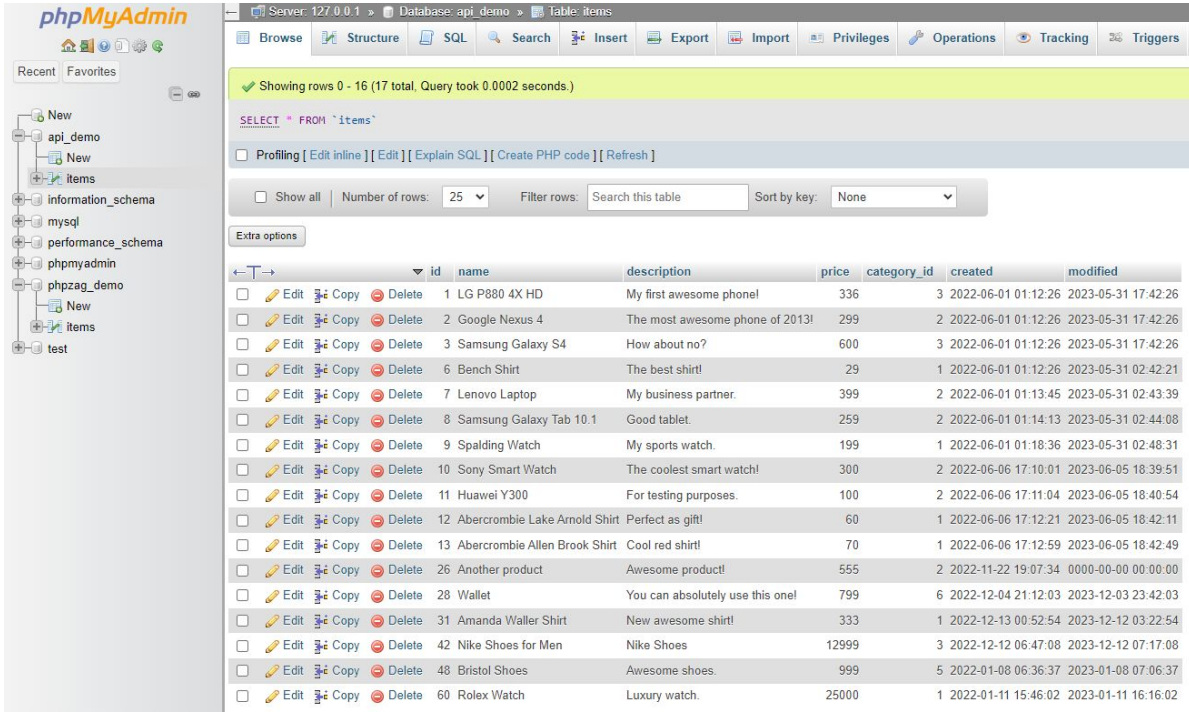
REST-API: Create database table

```
CREATE TABLE `items` (
  `id` int(11) NOT NULL,
  `name` varchar(256) NOT NULL,
  `description` text NOT NULL,
  `price` int(255) NOT NULL,
  `category_id` int(11) NOT NULL,
  `created` datetime NOT NULL,
  `modified` timestamp NOT NULL DEFAULT
CURRENT_TIMESTAMP
) ENGINE=MyISAM DEFAULT
CHARSET=utf8;
```



REST-API: Create database table

```
INSERT INTO `items` (`id`, `name`,
`description`, `price`, `category_id`,
`created`, `modified`) VALUES
(1, 'LG P880 4X HD', 'My first awesome phone!',
336, 3, '2022-06-01 01:12:26', '2023-05-31
17:42:26'),
(2, 'Google Nexus 4', 'The most awesome phone
of 2013!', 299, 2, '2022-06-01 01:12:26',
'2023-05-31 17:42:26'),....)

ALTER TABLE `items`
  ADD PRIMARY KEY (`id`);


ALTER TABLE `items`
  MODIFY `id` int(11) NOT NULL
AUTO_INCREMENT, AUTO_INCREMENT=61;
```



REST-API: Connect to database

Database.php

```
<?php
	class Database{

		private $host  = 'localhost';
		private $user  = 'root';
		private $password   = "";
		private $database  = "api_demo";

		public function getConnection(){
			$conn = new mysqli($this->host, $this->user, $this->password, $this->database);
			if($conn->connect_error){
				die("Error failed to connect to MySQL: " . $conn->connect_error);
			}
			else {
				return $conn;
			}
		 }
	}
?>
```

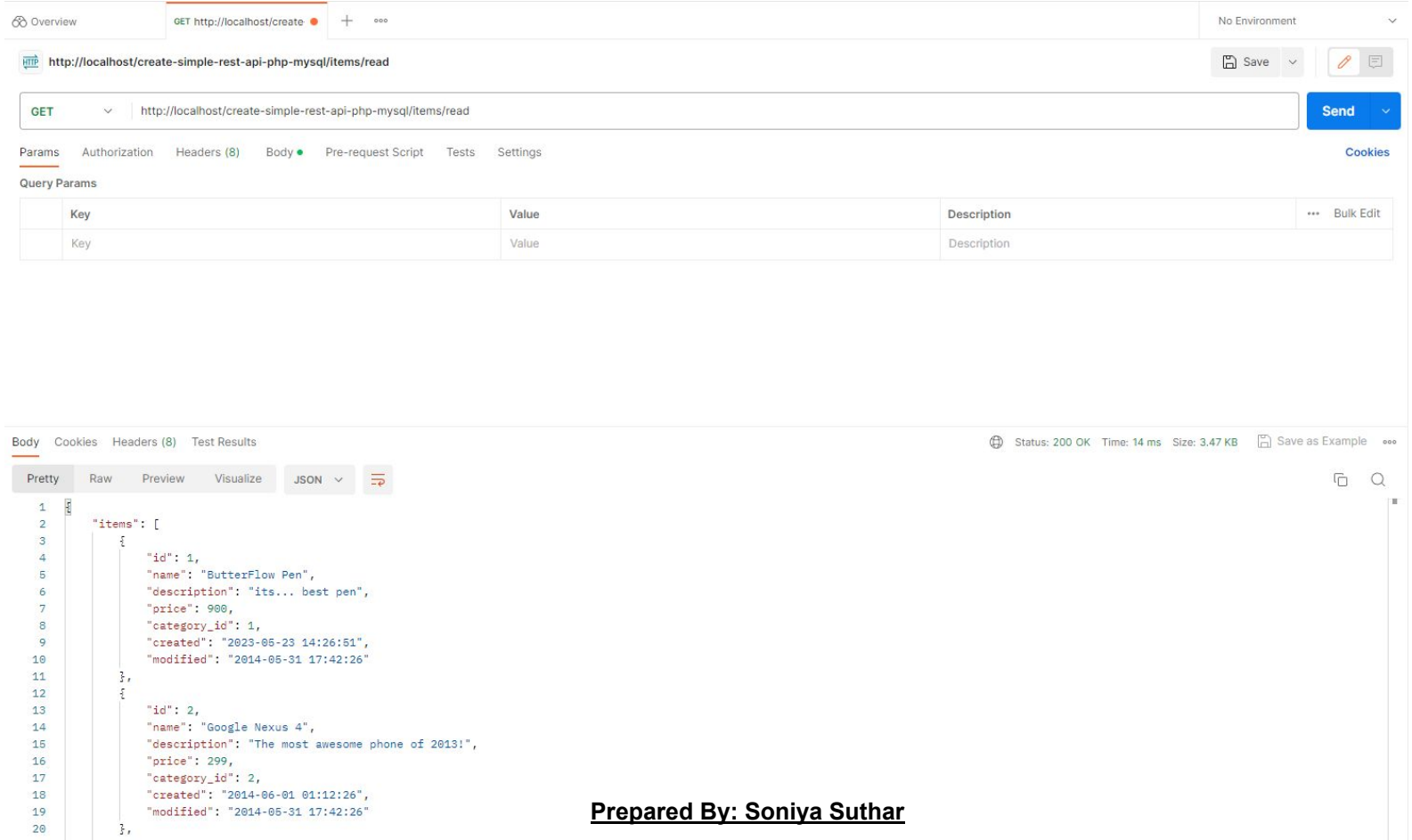
REST-API: Read(GET)

items/read.php

```
<?php
header("Access-Control-Allow-Origin: *");
header("Content-Type: application/json; charset=UTF-8");

include_once '../config/Database.php';
include_once '../class/Items.php';

$database = new Database();
$db = $database->getConnection();

$items = new Items($db);

$items->id = (isset($_GET['id']) && $_GET['id']) ? $_GET['id'] :
'0';

$result = $items->read();
```

```
if($result->num_rows > 0){
    $itemRecords=array();
    $itemRecords["items"]=array();
          while ($item = $result->fetch_assoc()) {
        extract($item);
        $itemDetails=array(
            "id" => $id,
            "name" => $name,
            "description" => $description,
                              "price" => $price,
            "category_id" => $category_id,
                              "created" => $created,
            "modified" => $modified
        );
       array_push($itemRecords["items"], $itemDetails);
    }
    http_response_code(200);
    echo json_encode($itemRecords);
}else{
    http_response_code(404);
    echo json_encode(
        array("message" => "No item found.")
    );
}
```

REST-API: Read(GET)



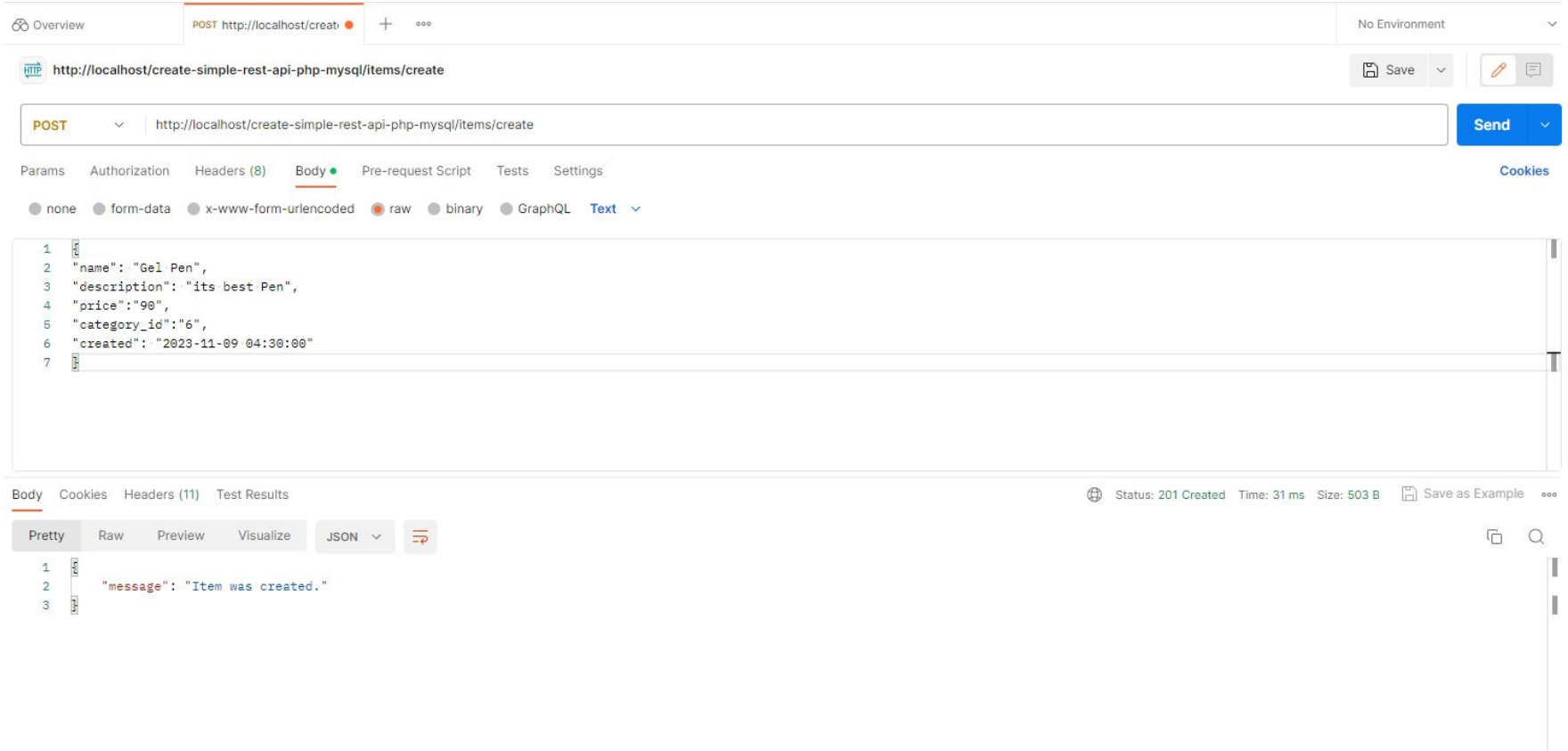
REST-API: Create(POST)

items/create.php

```
<?php
header("Access-Control-Allow-Origin: *");
header("Content-Type: application/json; charset=UTF-8");
header("Access-Control-Allow-Methods: POST");
header("Access-Control-Max-Age: 3600");
header("Access-Control-Allow-Headers: Content-Type,
Access-Control-Allow-Headers, Authorization,
X-Requested-With");

include_once '../config/Database.php';
include_once '../class/Items.php';

$database = new Database();
$db = $database->getConnection();

$items = new Items($db);

$data = json_decode(file_get_contents("php://input"));
```

```
if(!empty($data->name) && !empty($data->description) &&
!empty($data->price) && !empty($data->category_id) &&
!empty($data->created)){
    $items->name = $data->name;
    $items->description = $data->description;
    $items->price = $data->price;
    $items->category_id = $data->category_id;
    $items->created = date('Y-m-d H:i:s');

    if($items->create()){
        http_response_code(201);
        echo json_encode(array("message" => "Item was created."));
    } else{
        http_response_code(503);
        echo json_encode(array("message" => "Unable to create
item."));
    }
}else{
    http_response_code(400);
    echo json_encode(array("message" => "Unable to create item.
Data is incomplete."));
}
?>
```

REST-API: Create(POST)

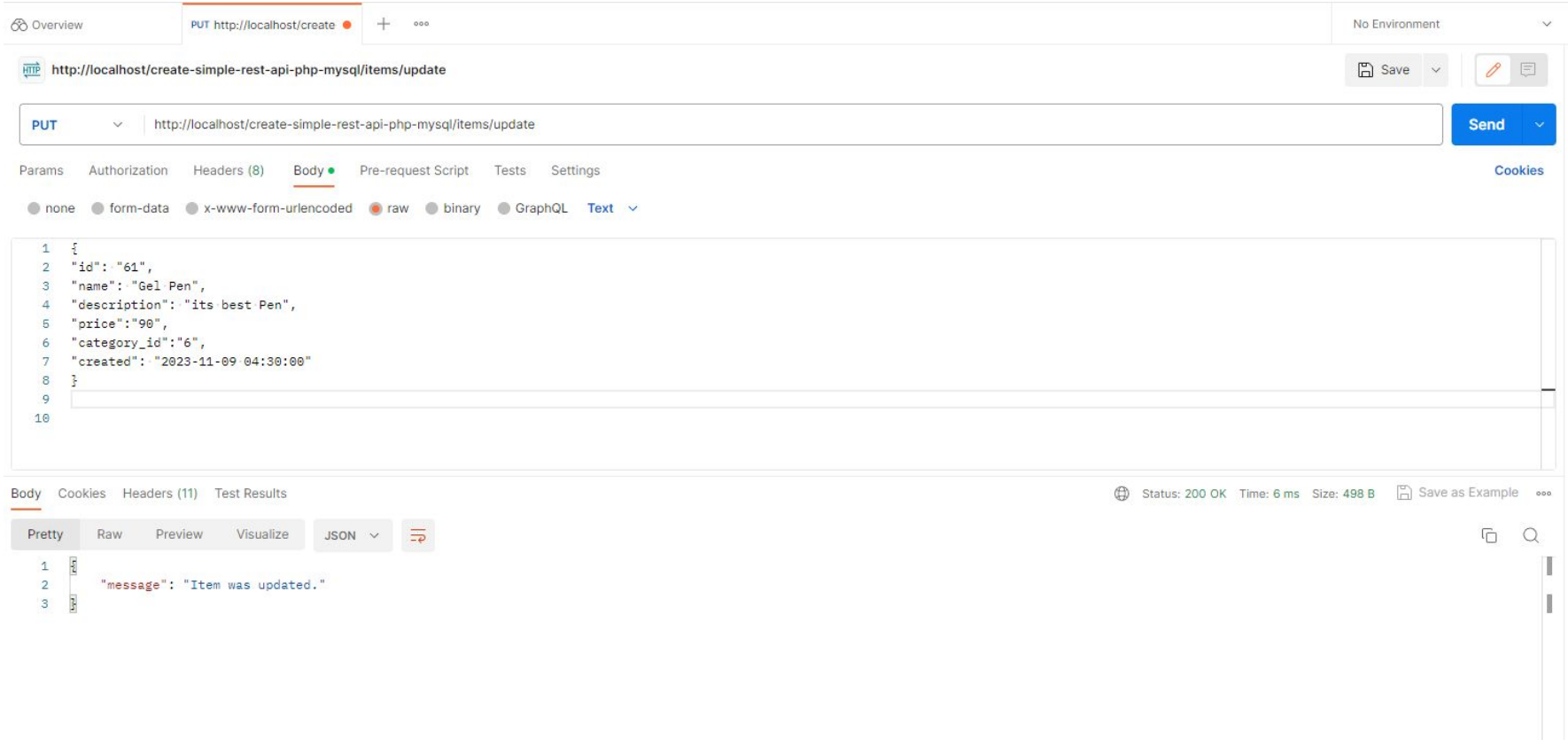


REST-API: Update(PUT)

items/update.php

```
<?php
header("Access-Control-Allow-Origin: *");
header("Content-Type: application/json; charset=UTF-8");
header("Access-Control-Allow-Methods: POST");
header("Access-Control-Max-Age: 3600");
header("Access-Control-Allow-Headers: Content-Type,
Access-Control-Allow-Headers, Authorization,
X-Requested-With");

include_once '../config/Database.php';
include_once '../class/Items.php';

$database = new Database();
$db = $database->getConnection();

$items = new Items($db);

$data = json_decode(file_get_contents("php://input"));
if(!empty($data->id) && !empty($data->name) &&
!empty($data->description) && !empty($data->price) &&
!empty($data->category_id)){

        $items->id = $data->id;
        $items->name = $data->name;
   $items->description = $data->description;
   $items->price = $data->price;
   $items->category_id = $data->category_id;
   $items->created = date('Y-m-d H:i:s');



        if($items->update()){
                http_response_code(200);
                echo json_encode(array("message" => "Item was
updated."));
        }else{
                http_response_code(503);
                echo json_encode(array("message" => "Unable to
update items."));
        }

} else {
        http_response_code(400);
   echo json_encode(array("message" => "Unable to update items.
Data is incomplete."));
}
?>
```

REST-API: Update(PUT)

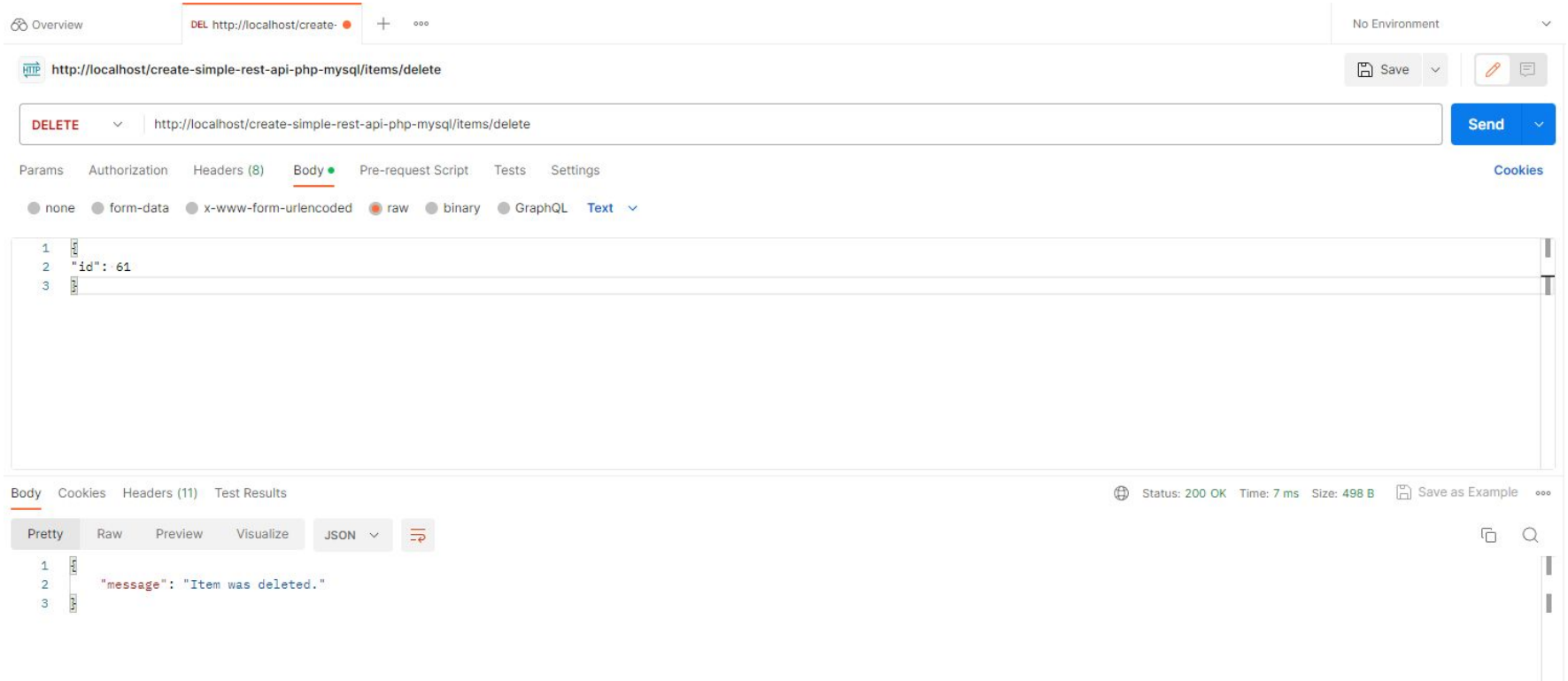


REST-API: Delete(DELETE)

items/delete.php

```
<?php
header("Access-Control-Allow-Origin: *");
header("Content-Type: application/json; charset=UTF-8");
header("Access-Control-Allow-Methods: POST");
header("Access-Control-Max-Age: 3600");
header("Access-Control-Allow-Headers: Content-Type,
Access-Control-Allow-Headers, Authorization,
X-Requested-With");

include_once '../config/Database.php';
include_once '../class/Items.php';

$database = new Database();
$db = $database->getConnection();

$items = new Items($db);

$data = json_decode(file_get_contents("php://input"));

if(!empty($data->id)) {
        $items->id = $data->id;
        if($items->delete()){
                http_response_code(200);
                echo json_encode(array("message" => "Item was
deleted."));
        } else {
                http_response_code(503);
                echo json_encode(array("message" => "Unable to
delete item."));
        }
} else {
        http_response_code(400);
    echo json_encode(array("message" => "Unable to delete items.
Data is incomplete."));
}
?>
```

REST-API: Delete(DELETE)



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