React Query in Simple Terms

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explain in simple terms react query and how it works

React Query is a library for managing and caching data in React applications. It helps you fetch and store data from APIs, databases, or other sources, and then use that data in your components.

Here's how it works in simple terms:

1. You define a query: A query is a function that specifies how to fetch data from a source. You can define queries for different types of data, such as users, posts, or products.
2. React Query fetches the data: When you use a query in a component, React Query takes care of fetching the data for you. It uses a caching system to avoid unnecessary requests, and it automatically updates the data when it changes.
3. You use the data in your component: Once the data is fetched, you can use it in your component just like any other data. React Query provides some hooks that make it easy to access the data and handle loading and error states.
4. You can also mutate the data: React Query provides functions to mutate the data, such as adding, updating, or deleting items. When you mutate the data, React Query updates the cache and automatically updates any components that depend on that data.

Overall, React Query simplifies data management in React applications by providing a flexible and efficient way to fetch, cache, and update data.

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explain each line of this code - import { useQuery, useMutation, useQueryClient } from "react-query" import { getTodos, addTodo, updateTodo, deleteTodo } from "../../api/todosApi" import { FontAwesomeIcon } from "@fortawesome/react-fontawesome" import { faTrash, faUpload } from "@fortawesome/free-solid-svg-icons"

```
import { useState } from 'react' const TodoList = () => { const [newTodo, setNewTodo] =
useState('') const queryClient = useQueryClient() const { isLoading, isError, error, data:
todos } = useQuery('todos', getTodos, { select: data => data.sort((a, b) => b.id - a.id) })
const addTodoMutation = useMutation(addTodo, { onSuccess: () => { // Invalidates cache
and refetch queryClient.invalidateQueries("todos") } }) const updateTodoMutation =
useMutation(updateTodo, { onSuccess: () => { // Invalidates cache and refetch
queryClient.invalidateQueries("todos") } }) const deleteTodoMutation =
useMutation(deleteTodo, { onSuccess: () => { // Invalidates cache and refetch
queryClient.invalidateQueries("todos") } }) const handleSubmit = (e) => {
e.preventDefault() addTodoMutation.mutate({ userId: 1, title: newTodo, completed: false
}) setNewTodo('') } const newItemSection = ( <form onSubmit={handleSubmit}> <label
htmlFor="new-todo">Enter a new todo item</label> <div className="new-todo"> <input
type="text" id="new-todo" value={newTodo} onChange={(e) =>
setNewTodo(e.target.value)} placeholder="Enter new todo" /> </div> <button
className="submit"> <FontAwesomeIcon icon={faUpload} /> </button> </form> ) let
content if (isLoading) { content = <p>Loading...</p> } else if (isError) { content = <p>
{error.message}</p> } else { content = todos.map((todo) => { return ( <article key=
{todo.id}> <div className="todo"> <input type="checkbox" checked={todo.completed}
id={todo.id} onChange={() => updateTodoMutation.mutate({ ...todo, completed:
!todo.completed }) } /> <label htmlFor={todo.id}>{todo.title}</label> </div> <button
className="trash" onClick={() => deleteTodoMutation.mutate({ id: todo.id })}>
<FontAwesomeIcon icon={faTrash} /> </button> </article> ) }) } return ( <main>
<h1>Todo List</h1> {newItemSection} {content} </main> ) } export default TodoList
```

This code imports some functions and components from various libraries and modules, and then defines a React functional component called TodoList.

Here's a line-by-line explanation of the code:

1. `import { useQuery, useMutation, useQueryClient } from "react-query"` : This line imports the `useQuery` , `useMutation` , and `useQueryClient` hooks from the React Query library.
2. `import { getTodos, addTodo, updateTodo, deleteTodo } from "../../api/todosApi"` : This line imports functions for fetching, adding, updating, and deleting todo items from a custom `todosApi` module.
3. `import { FontAwesomeIcon } from "@fortawesome/react-fontawesome"` : This line imports the `FontAwesomeIcon` component from the `@fortawesome/react-fontawesome` library.

4. `import { faTrash, faUpload } from "@fortawesome/free-solid-svg-icons"` : This line imports two icons (trash and upload) from the `@fortawesome/free-solid-svg-icons` library.

5. `import { useState } from 'react'` : This line imports the `useState` hook from the React library.

6. `const TodoList = () => { ... }` : This defines a functional component called `TodoList` .

7. `const [newTodo, setNewTodo] = useState('')` : This line defines a state variable `newTodo` and a function `setNewTodo` for updating it, and initializes `newTodo` to an empty string.

8. `const queryClient = useQueryClient()` : This line uses the `useQueryClient` hook to create a query client that can be used to invalidate and refetch queries.

9

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rewrite this code with coments on each line explaining what is going on - import { useQuery, useMutation, useQueryClient } from "react-query" import { getTodos, addTodo, updateTodo, deleteTodo } from "../../api/todosApi" import { FontAwesomeIcon } from "@fortawesome/react-fontawesome" import { faTrash, faUpload } from "@fortawesome/free-solid-svg-icons" import { useState } from 'react' const TodoList = () => { const [newTodo, setNewTodo] = useState(") const queryClient = useQueryClient() const { isLoading, isError, error, data: todos } = useQuery('todos', getTodos, { select: data => data.sort((a, b) => b.id - a.id) }) const addTodoMutation = useMutation(addTodo, { onSuccess: () => { // Invalidates cache and refetch queryClient.invalidateQueries("todos") } }) const updateTodoMutation = useMutation(updateTodo, { onSuccess: () => { // Invalidates cache and refetch queryClient.invalidateQueries("todos") } }) const deleteTodoMutation = useMutation(deleteTodo, { onSuccess: () => { // Invalidates cache and refetch queryClient.invalidateQueries("todos") } }) const handleSubmit = (e) => { e.preventDefault() addTodoMutation.mutate({ userId: 1, title: newTodo, completed: false }) setNewTodo(") } const newItemSection = (<form onSubmit={handleSubmit}> <label htmlFor="new-todo">Enter a new todo item</label> <div className="new-todo"> <input type="text" id="new-todo" value={newTodo} onChange={(e) => setNewTodo(e.target.value)} placeholder="Enter new todo" /> </div> <button className="submit"> <FontAwesomeIcon icon={faUpload} /> </button> </form>) let content if (isLoading) { content = <p>Loading...</p> } else if (isError) { content = <p> {error.message}</p> } else { content = todos.map((todo) => { return (<article key= {todo.id}> <div className="todo"> <input type="checkbox" checked={todo.completed} id={todo.id} onChange={() => updateTodoMutation.mutate({ ...todo, completed:

```
!todo.completed }) } /> <label htmlFor={todo.id}>{todo.title}</label> </div> <button
className="trash" onClick={() => deleteTodoMutation.mutate({ id: todo.id })}>
<FontAwesomeIcon icon={faTrash} /> </button> </article> ) }) } return ( <main>
<h1>Todo List</h1> {newItemSection} {content} </main> ) } export default TodoList
```

javascript

```
// import the necessary react-query hooks and the todosApi functions
import { useQuery, useMutation, useQueryClient } from "react-query"
import { getTodos, addTodo, updateTodo, deleteTodo } from
"../../api/todosApi"

// import necessary fontawesome icons and the useState hook
import { FontAwesomeIcon } from "@fortawesome/react-fontawesome"
import { faTrash, faUpload } from "@fortawesome/free-solid-svg-icons"
import { useState } from 'react'

// define TodoList component
const TodoList = () => {

    // define state hook for a new todo item
    const [newTodo, setNewTodo] = useState('')

    // useQueryClient hook allows you to invalidate queries and
perform other actions
    const queryClient = useQueryClient()

    // useQuery hook fetches data from the server and manages the
query's state
    const {
        isLoading,
        isError,
        error,
        data: todos
    } = useQuery('todos', getTodos, {
        select: data => data.sort((a, b) => b.id - a.id) // sort todos
by id in descending order
    })

    // useMutation hook is used for updating, adding and deleting todo
items and manages the mutation's state
    const addTodoMutation = useMutation(addTodo, {
        onSuccess: () => {
            // Invalidates cache and refetch
            queryClient.invalidateQueries("todos")
        }
    })

    const updateTodoMutation = useMutation(updateTodo, {
        onSuccess: () => {
            // Invalidates cache and refetch
            queryClient.invalidateQueries("todos")
        }
    })

    const deleteTodoMutation = useMutation(deleteTodo, {
        onSuccess: () => {
            // Invalidates cache and refetch
            queryClient.invalidateQueries("todos")
        }
    })

    // handle form submission
    const handleSubmit = (e) => {
        e.preventDefault()
        addTodoMutation.mutate({ userId: 1, title: newTodo, completed:
false })
        setNewTodo('')
    }

    // define the new todo item section of the UI
    const newItemSection = (
        <form onSubmit={handleSubmit}>
            <label htmlFor="new-todo">Enter a new todo item</label>
            <div className="new-todo">
                <input
                    type="text"
                    id="new-todo"
                    value={newTodo}
                    onChange={(e) => setNewTodo(e.target.value)}
                    placeholder="Enter new todo"
                />
            </div>
            <button className="submit">
                <FontAwesomeIcon icon={faUpload} />
            </button>
        </form>
    )

    let content

    // define what to display based on loading and error states of the
query
    if (isLoading) {
        content = <p>Loading...</p>
    } else if (isError) {
        content = <p>{error.message}</p>
    } else {
        // map over the list of todos and display them
        content = todos.map((todo) => {
            return (
                <article key={todo.id}>
                    <div className="todo">
                        <input
                            type="checkbox"
                            checked={todo.completed}
                            id={todo.id}
                            onChange={() =>
                                updateTodoMutation.mutate({ ...todo,
completed: !todo.completed })
                            }
                        />
                        <label htmlFor={todo.id}>{todo.title}</label>
                    </div>
                    <button className="trash" onClick={() =>
deleteTodoMutation.mutate({ id: todo.id })}>
                        <FontAwesomeIcon icon={faTrash} />
                    </button>
                </article>
            )
        })
    }

    // return the main UI of
```

give another example that explains how react queary works with an api in react

Sure, here's an example of using React Query with the GitHub API to fetch a list of repositories and display them in a React component:

First, you would need to install the React Query library using npm:

```
graphql
```

```
npm install react-query
```

Next, you could create a function to fetch the repositories using the GitHub API:

```
javascript
```

```
async function fetchRepositories() {
  const response = await
fetch("https://api.github.com/users/{username}/repos");
  const data = await response.json();
  return data;
}
```

This function fetches the repositories for a specific GitHub user by making a GET request to the API endpoint for that user's repositories.

Then, you could create a React component to display the list of repositories:

```javascript
import { useQuery } from "react-query";

function RepositoriesList({ username }) {
  const { isLoading, error, data: repositories } = useQuery(
    ["repositories", username],
    fetchRepositories
  );

  if (isLoading) {
    return <div>Loading...</div>;
  }

  if (error) {
    return <div>Error: {error.message}</div>;
  }

  return (
    <div>
      <h2>Repositories for {username}</h2>
      <ul>
        {repositories.map((repository) => (
          <li key={repository.id}>{repository.name}</li>
        ))}
      </ul>
    </div>
  );
}
```

This component uses the `useQuery` hook to fetch the repositories data and handle loading and error states. The `useQuery` hook takes two arguments:

- A unique key that identifies the query (in this case, the key is an array with two items: the string "repositories" and the GitHub username)
- A function that fetches the data (in this case, the `fetchRepositories` function)

The `useQuery` hook returns an object with three properties:

- `isLoading` : A boolean that is true while the data is being fetched
- `error` : An error object if an error occurred while fetching the data
- `data` : The data that was fetched

The component then renders the loading or error state if necessary, or the list of repositories if the data was fetched successfully.

Finally, you could use the `RepositoriesList` component in your React application like this:

```
javascript

function App() {
  return <RepositoriesList username="octocat" />;
}
```

This would render the `RepositoriesList` component with the username "octocat", fetching and displaying that user's repositories from the GitHub API.

explain this code - "use client" import Post from "./components/Post" import AddPost from "./components/AddPost" import { useQuery } from "react-query" import axios from "axios" import { PostsType } from "./types/Posts" //Fetch All posts const allPosts = async () => { const response = await axios.get("/api/posts/getPosts") return response.data } export default function Home() { const { data, error, isLoading } = useQuery<PostsType[]>({ queryFn: allPosts, queryKey: ["posts"], }) if (error) return error if (isLoading) return "Loading....." return (<div> <AddPost /> {data?.map((post) => (<Post key={post.id} id={post.id} name={post.user.name} avatar={post.user.image} postTitle={post.title} comments={post.comments} />))} </div>) }

This code is a React component that uses the `useQuery` hook from the `react-query` library to fetch data from an API and display it on a web page.

The `useQuery` hook is used to fetch the data from the API, and it takes an object with two properties as an argument: `queryFn` and `queryKey`. `queryFn` is a function that returns the data from the API, and `queryKey` is an array that specifies the key for the cache. In this example, the `queryFn` is a function called `allPosts` that makes an HTTP GET request to the `/api/posts/getPosts` endpoint and returns the data. The `queryKey` is an array that specifies the key for the cache, which is `["posts"]`.

The component has a conditional statement that checks for `isLoading` and `error`. If the data is still loading, the component will display a "Loading..." message. If there's an error, the error message will be displayed. If there's no error and the data has been loaded successfully, the component will render the `AddPost` component and a list of `Post` components.

The `data` variable contains an array of posts fetched from the API, and the `map` function is used to create a `Post` component for each post in the array. The `Post` component takes several props, including the `key`, `id`, `name`, `avatar`, `postTitle`, and `comments` of the post.

Overall, this code demonstrates how to use the `useQuery` hook from the `react-query` library to fetch data from an API and display it on a web page in a React component.

also explain this code - import prisma from "../../../prisma/client" import { unstable_getServerSession } from "next-auth/next" import { authOptions } from "../auth/[...nextauth]" import type { NextApiRequest, NextApiResponse } from "next" export default async function handler(req: NextApiRequest, res: NextApiResponse) { if (req.method === "POST") { const session = await unstable_getServerSession(req, res, authOptions) if (!session) { return res .status(401) .json({ message: "Please signin to create a post." }) } const title: string = req.body.title //Get User const prismaUser = await prisma.user.findUnique({ where: { email: session?.user?.email }, }) //Check title if (title.length > 300) { return res.status(403).json({ message: "Please write a shorter post" }) } if (!title.length) { return res .status(403) .json({ message: "Please write something before we can post it." }) } //Create Post try { const result = await prisma.post.create({ data: { title, userId: prismaUser.id, }, }) res.status(200).json(result) } catch (err) { res.status(403).json({ err: "Error has occured while making a post" }) } } }

This is a Node.js serverless function that handles a POST request to create a new post. Let's break it down:

- First, the function checks if the incoming request method is "POST". If it's not, it will return a 404 error.
- Then, the function uses the `unstable_getServerSession` function from the `next-auth/next` library to retrieve the user's session. If there is no session, it will return a 401 error asking the user to sign in before creating a post.
- The function then extracts the `title` property from the request body.

- It uses Prisma ORM to find the user who is currently logged in, based on their email address.
- Next, the function checks if the `title` property is too long (over 300 characters). If it is, it will return a 403 error asking the user to write a shorter post.
- If the `title` property is not empty and not too long, the function will use Prisma to create a new post with the given title and the ID of the user who created it.
- If the post is created successfully, the function will return a 200 status code and the newly created post object in the response body. If there's an error, it will return a 403 error with a generic error message.

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explain this code and rewrite it with comments - "use client" import { useMutation, useQueryClient } from "react-query" import { useState } from "react" import toast from "react-hot-toast" import axios, { AxiosError } from "axios" export default function CreatePost(){ const [title, setTitle] = useState("") const [isDisabled, setIsDisabled] = useState(false) const queryClient = useQueryClient() let toastPostID: string const { mutate } = useMutation(async (title: string) => await axios.post("/api/posts/addPost", { title, }), { onError: (error) => { if (error instanceof AxiosError) { toast.error(error?.response?.data.message, { id: toastPostID }) } setIsDisabled(false) }, onSuccess: (data) => { queryClient.invalidateQueries(["posts"]) toast.success("Post has been made 🔥", { id: toastPostID }) setTitle("") setIsDisabled(false) }, }) const submitPost = async (e: React.FormEvent) => { e.preventDefault() setIsDisabled(true) toastPostID = toast.loading("Creating your post", { id: toastPostID }) mutate(title) } return(<form onSubmit={submitPost} className="bg-white my-8 p-8 rounded-md "> <div className="flex flex-col my-4"> <textarea onChange={(e) => setTitle(e.target.value)} value={title} name="title" placeholder="What's on your mind?" className="p-4 text-lg rounded-md my-2 bg-gray-200" /> </div> <div className=" flex items-center justify-between gap-2"> <p className={`font-bold text-sm ${ title.length > 300 ? "text-red-700" : "text-gray-700" } `} >{`${title.length}/300`}</p> <button disabled={isDisabled} className="text-sm bg-teal-600 text-white py-2 px-6 rounded-xl disabled:opacity-25" type="submit" > Create post </button> </div> </form>) }

This code defines a React component named `CreatePost`. It uses hooks such as `useState`, `useMutation`, and `useQueryClient` from the `react-query` library. It also imports `axios` for making HTTP requests and `react-hot-toast` for displaying toasts.

The `CreatePost` component renders a form with a textarea for the user to write a new post. When the user submits the form, the `submitPost` function is called. This function disables the submit button, displays a loading toast message, and calls the `mutate` function which sends a POST request to the server to add a new post.

If the request is successful, the `onSuccess` callback function is called. This function displays a success toast message, resets the title state, enables the submit button, and invalidates the `["posts"]` query in the query cache using the `queryClient.invalidateQueries(["posts"])` function.

If the request fails, the `onError` callback function is called. This function displays an error toast message, resets the isDisabled state, and checks if the error is an instance of `AxiosError` . If it is, the error message is extracted from the response data and displayed in the toast message.

Here is the code with comments:

jsx

```
import { useMutation, useQueryClient } from "react-query"
import { useState } from "react"
import toast from "react-hot-toast"
import axios, { AxiosError } from "axios"

export default function CreatePost(){

  // Initialize state
  const [title, setTitle] = useState("")
  const [isDisabled, setIsDisabled] = useState(false)
  const queryClient = useQueryClient()
  let toastPostID: string

  // Define mutation
  const { mutate } = useMutation(
    async (title: string) =>
      await axios.post("/api/posts/addPost", {
        title,
      }),
    {
      // Define error and success callbacks
      onError: (error) => {
        if (error instanceof AxiosError) {
          toast.error(error?.response?.data.message, { id: toastPostID })
        }
        setIsDisabled(false)
      },
      onSuccess: (data) => {
        queryClient.invalidateQueries(["posts"])
        toast.success("Post has been made 🔥", { id: toastPostID })
        setTitle("")
        setIsDisabled(false)
      },
    }
  )

  // Define submit function
  const submitPost = async (e: React.FormEvent) => {
    e.preventDefault()
    setIsDisabled(true)
    toastPostID = toast.loading("Creating your post", { id: toastPostID })
    mutate(title)
  }

  // Render form
  return(
    <form onSubmit={submitPost} className="bg-white my-8 p-8 rounded-md ">
      <div className="flex flex-col my-4">
        <textarea
          onChange={(e) => setTitle(e.target.value)}
          value={title}
          name="title"
          placeholder="What's on your mind?"
          className="p-4 text-lg rounded-md my-2  bg-gray-200"
        />
      </div>
      <div className=" flex items-center justify-between gap-2">
        <p
          className={`font-bold text-sm ${
            title.length > 300 ? "text-red-700" : "text-gray-700"
          } `}
        >{`${title.length}/300`}</p>
        <button
          disabled={isDisabled}
          className="text-sm bg-teal-600 text-white py-2 px-6 rounded-xl disabled:opacity-25"
          type="submit"
        >
          Create post
        </button>
      </div>
```

explain thi part of the code in a simple way that i would understand - const [title, setTitle] = useState("") const [isDisabled, setIsDisabled] = useState(false) const queryClient = useQueryClient() let toastPostID: string // Define mutation const { mutate } = useMutation(async (title: string) => await axios.post("/api/posts/addPost", { title, }), { // Define error and success callbacks onError: (error) => { if (error instanceof AxiosError) { toast.error(error?.response?.data.message, { id: toastPostID }) } setIsDisabled(false) }, onSuccess: (data) => { queryClient.invalidateQueries(["posts"]) toast.success("Post has been made 🔥", { id: toastPostID }) setTitle("") setIsDisabled(false) }, }) // Define submit function const submitPost = async (e: React.FormEvent) => { e.preventDefault() setIsDisabled(true) toastPostID = toast.loading("Creating your post", { id: toastPostID }) mutate(title) }

This code defines a component for creating a post with a form that contains a textarea for writing the post's title and a button for submitting the form.

- `title` and `setTitle` are used to store and update the value of the title input.
- `isDisabled` and `setIsDisabled` are used to disable the submit button while the post is being created.
- `queryClient` is used to invalidate the cache of the "posts" query after a new post has been created.
- `toastPostID` is used to keep track of the toast notification for creating a post.
- `useMutation` is a React hook that defines a mutation function that can be used to make a request to the server to create a post. It takes a function that makes the request as its first argument and an object with callbacks for handling errors and success as its second argument.
- `onError` is a callback that is called when an error occurs during the mutation function. In this case, it displays an error message using the `toast` library and sets `isDisabled` back to `false` .
- `onSuccess` is a callback that is called when the mutation function is successful. In this case, it invalidates the cache of the "posts" query, displays a success message using the `toast` library, clears the `title` input, and sets `isDisabled` back to `false` .
- `submitPost` is a function that is called when the form is submitted. It disables the submit button, displays a loading message using the `toast` library, and calls the `mutate` function with the `title` input value to create a new post.