W9 - PRACTICE

Going deeper with states

At the end of his practice, you should be able to...

- ✓ Reflect on **your usage of states**
- ✓ Style widgets dynamically
- ✓ **Pass functions** as value to props
- ✓ **Handles objects** in states
  - Treat state as **read-only**
  - Copy objects with the **spread syntax**

How to work?

- ✓ Download **the start code** from the Google classroom
- ✓ For each exercise you can either:
  - Run `npm install`
  - Or move an existing `node_modules` to the exercise folder *(fastest option!)*

How to submit?

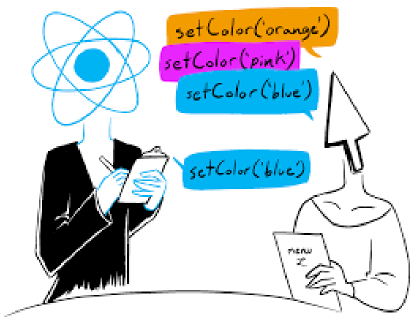
- ✓ **Create a repository on GitHub** with the name of this practice:

  Ex: C2-S6 PRACTICE
- ✓ **Push your final code** on this GitHub repository (if you are lost, follow this tutorial)
- ✓ Finally submit on **Google classroom** your GitHub repository URL

  Ex: `https://github.com/thebest/ C2-S6 PRACTICE.git`

Are you lost?

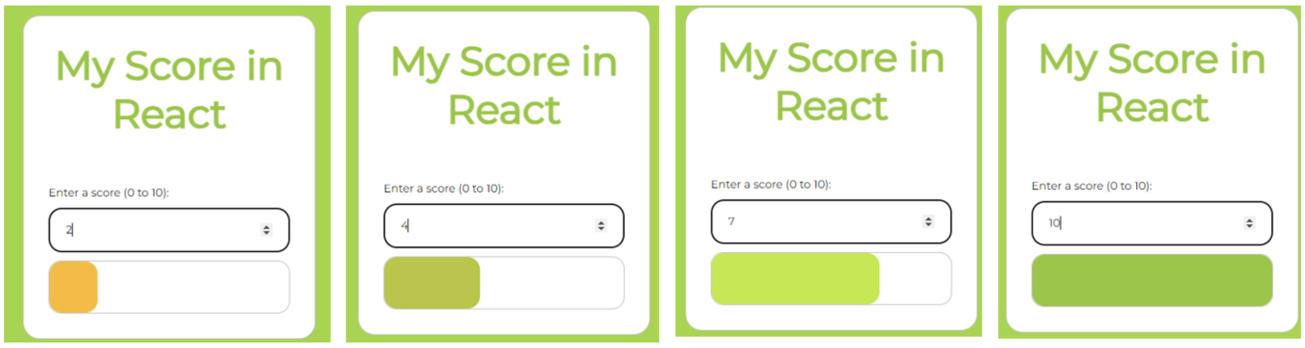
You can read the following documentation to be ready for this practice:
https://www.w3schools.com/react/react_events.asp
https://react.dev/learn/updating-objects-in-state



EXERCISE 1

You can click on this link to see the expected results for this exercise:
https://react-s11-ex1.vercel.app/

The goal of this app is to update the progress bar, according to the value entered in the input field:
- Values range are from 0 to 10
- Progress bar color changes depending on the score (see bellow)



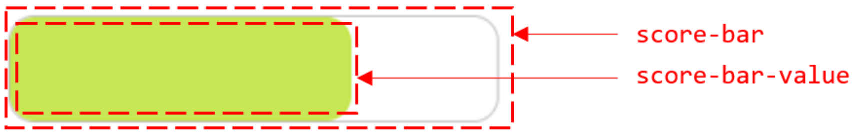
Depending on the score value (0 to 10) the progress bar with and color shall be updated

Step 1: What is/are the state(s) you plan to use for this exercise? Complete the table.

State Name	Type	Role	Used for…	Changed when…
score	useState (number or string)	Stores the user’s input value	Updating the progress bar width and color	The user types a number(0-10) in the input field

Step 2: Update the **progress bar width** according to the score value

Tips: The progress has 2 div: the border rectangle and the filled rectangle. Which one should you update?



Step 3: Update the **progress bar color** according to the score value

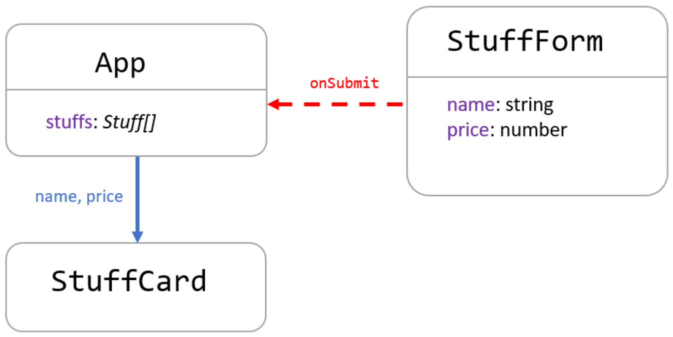
EXERCISE 2

You can click on this link to see the expected results for this exercise:
https://react-s11-ex2.vercel.app/

The user can specify an object name and price. By clicking on Add, this object shall be added to the list.

Step 1:
Look at the start code. We have 3 components.

- ✓ App manages a state with the list of objects
- ✓ StuffCard displays 1 object *(nothing to change on this component!)*
- ✓ StuffForm manages the form and send an event when user has click on Add



Complete the **StuffFrom** to handle the input values with the following states:

State	Type	Component	Used to…	Changed when…
name	String	StuffFrom	Store the entered name	Input name had changed
price	number	StuffFrom	Store the entered price	Input price had changed

Step 2:
When user clicks on Add button, the StuffFrom component sends an event to the App component
Complete the code to send this event, with the entered name and price as parameter

Note: For now, just log something on the console to check you can manage the event on App component. For example:

```
A new object named Piano, price 15$ will be added to the list
```

Step 3:
The last step is to update the state containing the stuff, with the new object.

State	Type	Component	Used to…	Changed when…
stuff	Array	App	Storing all stuffs	Add a new stuff

First read the following articles about **objects** and **arrays** in state:

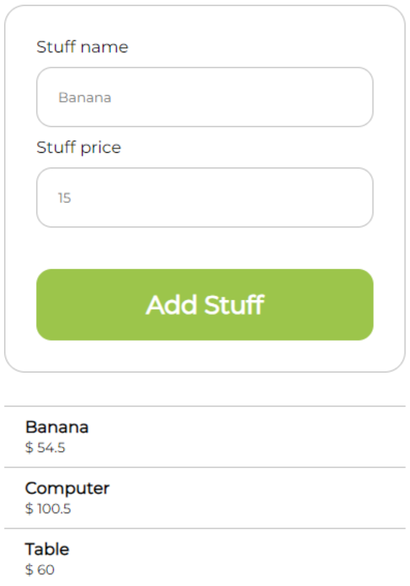
- https://react.dev/learn/updating-objects-in-state
- https://react.dev/learn/updating-arrays-in-state

Q1 – Why states containing an array or an object **should be treated as read only**?
Modifying state directly won't trigger re-renders, leading to unexpected UI behavior. Always use `setState()` with a new copy.
Q2 – Why do we need to **create a new array** when we want to add a created object to a state array?
React detects changes by comparing references. If we modify the existing array (`push()`), the reference stays the same, and React might not update the UI. Creating a new array ensures proper re-renders.
Q3 – What is the **spread operator**? How can you use it to clone the state array and add the new created object?
The spread operator (`...`) copies an array. To add a new object at the **top** of the list:

```
setStuffs([newStuff, ...stuffs]);
```

Q4 – Then complete the code to update the state array with the new object.

The finished app will look like this:

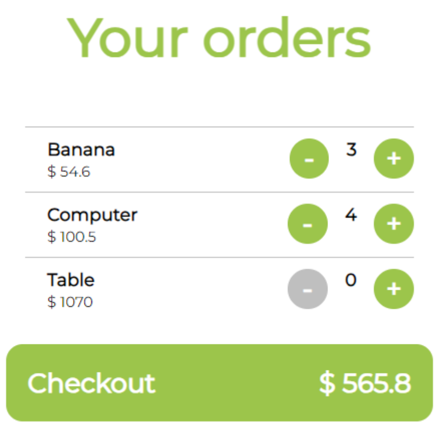


EXERCISE 3

You can click on this link to see the expected results for this exercise:
https://react-s11-ex3.vercel.app/

This app allows the user to adjust the quantity of items to buy and to compute the total price.
Note: the minus button is disabled when the quantity is equal to 0.

The finished app will look like this:



Step 1:
Look at the start code. We have 3 components.

- ✓ App manages a state with the list of items
- ✓ Order Card handle the quantity to order for 1 item
- ✓ CheckoutButton displays the total sum *(nothing to change on this component!)*

Q1 - What is/are the state(s) you plan to use for this exercise? Complete the table.

State Name	Type	Component	Used for…	Changed when…
orders	Array	App	Storing the list of items (products with price and quantity).	Quantity of an item is changed by the user (increase or decrease).
total	Number	App	Storing the total price of all orders.	When the `orders` state changes, the total price is recalculated.

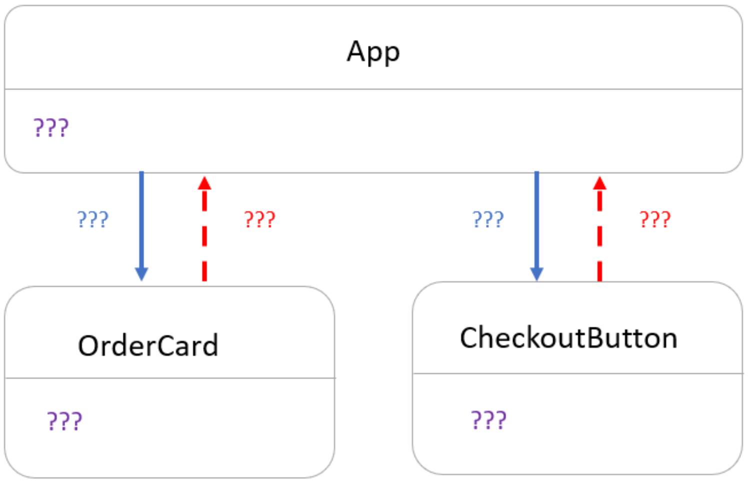
Tips: Is the total price a state?

Q2 - What are the interactions you plan to define between the components?
Complete the diagram: *purple=states*, *blue=props data*, *red=prop event*
purple=states
orders (state)
total (state)

blue=props data
product (prop)
price (prop)
quantity (prop)
onQuantityChange (event)
total (prop)

red=prop event
onQuantityChange
recalculated total

Tips: what's happen when you press + or – button on an item card? Which component will handle the state update?



Q3 – Update the code to display each item using `OrderCard` components (name, unit price and current quantity)

To display each item using `OrderCard` components, we will:

1. Pass the product name, price, and quantity as props to `OrderCard`.
2. Render each item dynamically in the `App` component using `.map()` to create an `OrderCard` for each item.

Note: For now, the + and – button do not work!

Q4 – Update the code to **send the right total price** to the `CheckoutButton`

To calculate the total price of all the items in the cart, we need to:

1. Calculate the total price for each item as `price * quantity`.
2. Sum up the total price for all items.
3. Pass the total price to the `CheckoutButton`.

Tips: It's always good to separate our code with clear functions!

Q5 – When user click on + or - the quantity of the related item must change, and also the total price

- Which state needs to be updated? Which component manages this state?

  - **State to update**: The `orders` state (which holds the list of items including their names, prices, and quantities) needs to be updated when the quantity changes.

  - **Component managing this state**: The `App` component manages the `orders` state.

Tips: you don't know how to update a state array?

- Read again this document (section Replacing items in an array)
- Understand how to use the non-mutating methods `map` and spread operation to perform this operation.

Q6 – When quantity is equal to 0, the **minus button shall be disabled** on the order card.

To effectively disable the button, we need to display it gray but also prevent any action when clicking on it.

Therefore, when quantity is equal to 0:

- The minus button background is gray (`#bfbfbf`)
- No action can be done when clicking on minus button