Questions – c18490924

1. Explain using code examples what is meant by props and state in React JS?

Props and state in react are both variables, but with one difference – props are variables passed to the child component from the parent component, whereas state are variables managed by the component itself. Examples of props in a functional component are seen below:

function Note(*props*) {

  return (

    <textarea *style*={{ backgroundColor: *props*.colour }} *class*="note">

      {*props*.text}

    </textarea>

  );

}

Here the note component is receiving props variables from its parent component – colour and text. Next an example of state:

const [noteText, setNoteText] = useState("");

Here in a functional component, we are using the useState hook to manage the state of a variable within the component.

1. In functional programming, what does the term functor mean? Can you give an example in JavaScript?

In functional programming, a functor is simply something that can be mapped over. In JavaScript all arrays are functors as they hold values. In JavaScript we also have the .map function which we can use to map something over an array.

1. We have looked at three kinds of asynchronous programming mechanisms, namely callbacks, promises and streams. Mention one advantage and one disadvantage of each type.

Promises:

One advantage of using promises is that we can chain async callbacks in a readable way for example by using .then rather than jumping between conditions. This makes the code easier to maintain. One disadvantage of promises is debugging can be challenging for the same reason as the advantage, the async call backs are chained, meaning we cannot step over each block when debugging.

Streams:

One advantage of using streams is that they increase the performance of the program even when memory is limited. One disadvantage of streams is that it is impossible to predict the amount of data that you will receive/process before the stream ends.

Callbacks:

One advantage of callbacks is they can be used to ensure a function will not be run until the callback has been completed. This is useful in asynchronous programming.

One disadvantage of callbacks is when we have multiple components that may need to interact with one another simultaneously, or one component that needs to receive multiple amounts of data at a time.

1. With the aid of a diagram and example code, describe the Cascading Style Sheets (CSS) Box Model and show how it can be used to space DOM elements

The css box model (pictured below) is a box around all HTML elements that is used for multiple reasons such as styling and positioning.

Table

Description automatically generated

Say the content is a picture in a <img> tag. If we want to add a rounded border to this we could do:

border: 5px solid #4e4e50;

border-radius: 10px;

This adds a grey curved border to the picture. Next if we wish to distance the <img> from the border we can add some padding with:

padding: 20;

This creates distance between the border and the content

Finally, if we want to move the <img> including the border away from another element or the edge of the page we can give it a margin like this:

  margin: 2%;

1. Detail how the browser loads and bootstraps a rich web application from an initial URL.

Once the browser receives the url it must first find the ip address for the domain and connect to it. Then it sends a HTML request to the server and gets the response. Then all the files are sent to the browser, from .css .js and .html files to images as well. Next the browser creates the Document Object Model from these and once it is ready the browser will begin to load the page.