**React.js Beginner’s Guide**

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**1. Introduction to React.js**

React.js ni JavaScript library ikoreshwa mu gukora **user interfaces (UI)**, cyane cyane izihinduka cyane (dynamic). Yakozwe na Facebook kugira ngo yihutishe iterambere rya front-end applications.

**Kuki React ari ngombwa?**

1. **Speed:** React yihutisha uburyo bwo gukora UI kuko ituma page ihinduka idasubiranyweho yose (no full page reload).
2. **Reusable Components:** Gukoresha ibice bimwe (components) ahantu henshi bigabanya umubare w'akazi.
3. **Community:** React ifite abatechnical benshi ku isi, bivuze ko ushobora kubona tutorials cyangwa inkunga byoroshye.

**Urugero rw’ibyo React ikora:**

* Ibyo ubona kuri Facebook (likes, comments, news feed) byose bikorwa na React.

**2. Setting Up Your Environment**

Mbere yo gutangira gukoresha React.js, ugomba kubanza gutunganya ibikoresho byo kuyikoresha.

**Ibisabwa:**

1. **Node.js:**
   * Node.js ni runtime environment idufasha gukoresha JavaScript mu mashini yacu (computer) idakoresheje browser.
   * Itanga tools nka npm (Node Package Manager) ifasha gushaka no gukoresha libraries zitandukanye.

*Kubera iki dukeneye Node.js muri React?*

* + Iyo uri gukora React, ugomba gushyiraho dependencies (“ibikoresho”) bifasha gufasha React gukora neza. Npm niyo ikoreshwa muri ibyo byose.

1. **Code Editor (VS Code):**
   * Gukoresha VS Code biroroshye kandi bifite features nyinshi nka syntax highlighting na debugging tools.
2. **Browser:**
   * React itekerezwa gukorera muri browser, nka Google Chrome, izindi nka Firefox nazo zirakora neza.
   * Ugomba no gushyiraho **React Developer Tools** muri Chrome.

**3. Creating Your First React App**

Iyo umaze gushyiraho Node.js, ugomba gukoresha command ya Node itangiza project ya React.

**Steps:**

1. Fungura terminal yawe (Command Prompt cyangwa bash).
2. Koresha command ikurikira:

npx create-react-app my-first-app

* + **npx:** Ikoreshwa mu kwihutisha tool itari installed muri global environment.
  + **create-react-app:** Ni tool izana React environment yose iri tayari.
  + **my-first-app:** Izina rya project yawe.

1. Injira muri folder yawe ukoresheje:

cd my-first-app

1. Tangiza development server ukoresheje:

npm start

Iyi command izafungura browser yawe kuri http://localhost:3000, aho uzabona React app ya default iri ready.

**4. Understanding React Components**

**Icyo Components Bisobanura**

* Component ni igice kigize application yawe.
* Ushobora kubona components nk’ibice bitandukanye bya page, nko hejuru (header), hagati (content), cyangwa hasi (footer).

**Impamvu Dukoresha Components**

1. **Reusable:** Component imwe ishobora gukoreshwa henshi.
2. **Clean Code:** Bituma code yawe iba yanditse neza kandi yoroheje gusoma.
3. **Easier Debugging:** Wabona error muri component imwe aho kuyishakisha muri application yose.

**5. JSX: Writing HTML in JavaScript**

**Ibyerekeye JSX**

JSX (JavaScript XML) ni uburyo bwo kwandika HTML muri JavaScript muri React. Iyi syntax ituma ushobora gushyira structure yawe mu function component.

**Urugero rwa JSX:**

function Welcome() {

return <h1>Murakaza Neza ku React!</h1>;

}

Ibi bihindurwamo JavaScript isanzwe na tools nka Babel.

**Kuki JSX ari ngombwa?**

* Iroroshya uburyo bwo kwandika interfaces.
* Ituma ushobora kuvanga logic (JavaScript) n’ibyo ubona muri browser (HTML).

**6. Props and State in React**

**1. Props:**

Props (properties) ni data yoherezwa hagati ya components. Zikoreshwa mu gutuma component imwe iba flexible.

**Urugero:**

function Greeting(props) {

return <h1>Hello, {props.name}!</h1>;

}

<Greeting name="Ismail" />

**2. State:** State ni data ivugururwa muri component imwe gusa. Ikunze gukoreshwa mu bintu bihinduka.

**Urugero:**

function Counter() {

const [count, setCount] = React.useState(0);

return (

<div>

<p>Imibare iri kuri: {count}</p>

<button onClick={() => setCount(count + 1)}>Increase</button>

</div>

);

}

**7. Events and Event Handling**

React ifite uburyo bwo kugenzura ibyo user akora (events) nko gukanda button cyangwa kwandika.

**Urugero:**

function ClickMe() {

function handleClick() {

alert('Wakanditse kuri button!');

}

return <button onClick={handleClick}>Kanda hano</button>;

}

**8. React Developer Tools**

Ni extension yo muri browser igufasha kureba structure ya components, state, na props.

* Fungura inspector muri Chrome, urebe tab ya React.

**9. Why Do We Use Node.js with React?**

Node.js ni runtime environment y’ingenzi muri development ya React:

1. **Gukoresha npm/yarn:**
   * Npm idufasha gushiraho dependencies nka React.
2. **Development Server:** Node.js itanga localhost (http://localhost:3000) aho ushobora kureba project yawe live.
3. **Babel na Webpack:** Bifasha guhindura JSX no kugabanya size ya application yawe.

**10. React Lifecycle Methods**

React components zigira ubuzima, guhera zishyizwe muri DOM kugeza zikuwemo.

* **Mounting:** Iyo component yashyizwe kuri page.
* **Updating:** Iyo data ihindutse muri state cyangwa props.
* **Unmounting:** Iyo component ikuweho.

**Urugero rw’ubuzima bwa component:**

class MyComponent extends React.Component {

componentDidMount() {

console.log('Component yashyizweho!');

}

componentWillUnmount() {

console.log('Component yakuweho!');

}

render() {

return <h1>Muraho!</h1>;

}

}

**11. Building a Simple Project**

1. **Objective:** Kubaka application itanga liste y’ibintu.
2. **Steps:**
   * Shyiraho React environment.
   * Andika components zitandukanye.
   * Koreshya props na state.
3. **Code:**
4. function App() {
5. const [tasks, setTasks] = React.useState(['Kwiga React', 'Gukora Project']);
6. return (
7. <div>
8. <h1>Ibikorwa byanjye</h1>
9. <ul>
10. {tasks.map((task, index) => (
11. <li key={index}>{task}</li>
12. ))}
13. </ul>
14. </div>
15. );
16. }