CSCI2720/ESTR2106 ASSIGNMENT 2: **SIMPLE IMAGE SYSTEM IN REACT**

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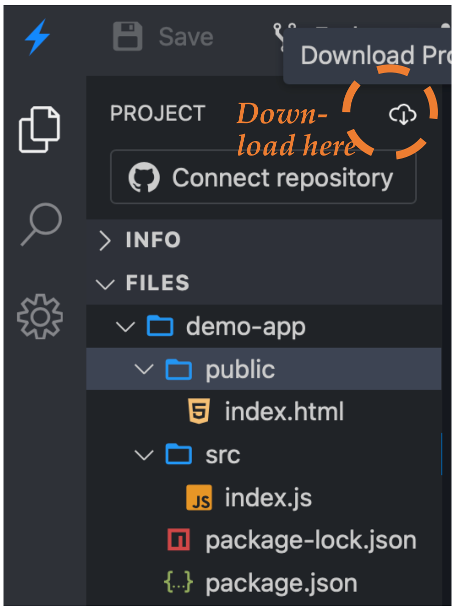
SYNOPSIS

You are going to set up a simple system for showing images using React. It includes a slideshow feature with adjustable speed, as well as links for routing within the single-page application.

ENVIRONMENT SETUP



You may start with the given code of routing in ***Lab 6*** (via *stackblitz.com*), as well as the picture system in ***Lab 5***. As *stackblitz.com* does not support file upload with free accounts, you need to set up Node.js and npm on your local computer to finish the assignment. Node.js of version at least v16 should be used. You may get started with these steps:

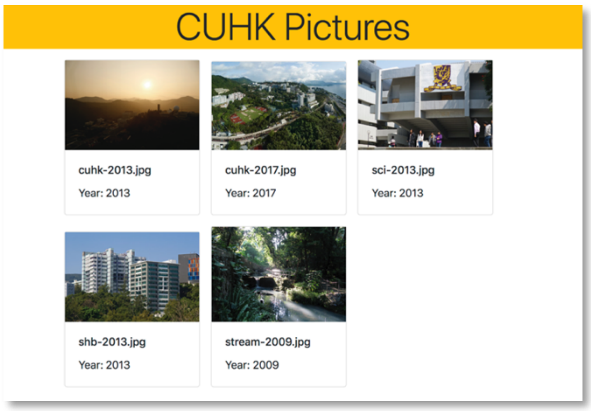
1. From your Lab 6 work, download the project
2. From your Lab 5 work, extract the React components and put them into `src/index.js`
3. The Lab 5 `images` folder can be put into `public/`
4. Put the Lab 5 HTML contents, except the React/Babel CDN links, into `public/index.html`
5. Run **`npm start`** in the **`demo-app`** directory to start a React development server for work

You may use these declarations in the top of your .js file:

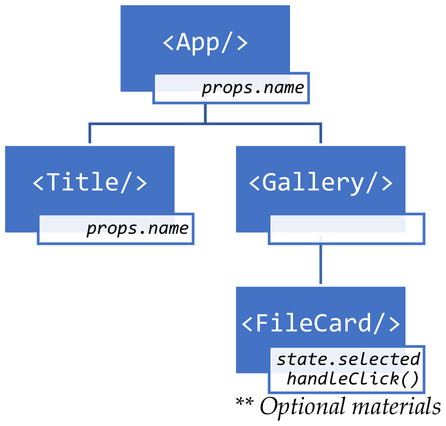
```
import ReactDOM from 'react-dom/client';
import React from 'react';
import { useEffect, useState } from 'react';
import { BrowserRouter, Routes, Route, Link } from 'react-router-dom';
import { useMatch, useParams, useLocation } from 'react-router-dom';
```

BASIC SYSTEM (25%)

(Done in Lab 5) Build a simple image system to display an array of image files. The file names and relevant information of each file are stored as a variable in an JS array, ***as specified in Lab 5***.



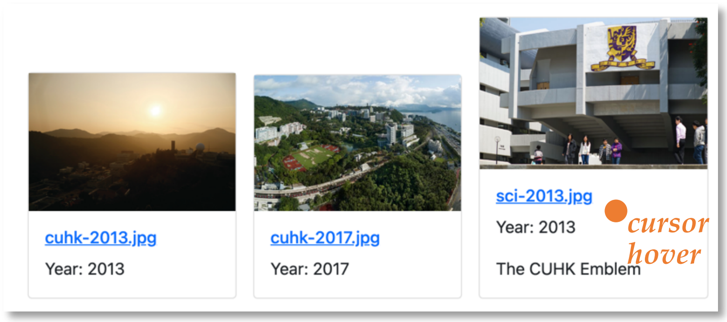
The React components in the basic system are structured in this manner:



The images are shown in a group of ***Bootstrap*** cards with width 200px each, using the `map()` function to render multiple **`<FileCard/>`** components. The filename and year are shown along with the image.

MOUSEOVER EVENT (25%)

In the optional materials in Lab 5, you are instructed to set up an **`onClick`** event to enlarge the image card to 100% width when clicked. The file remarks are shown as well. This is be done using the **`onClick`** event to change the state **`selected`** to the index of the image.



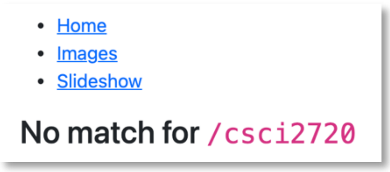
Now, change this to an **`onMouseOver`** event so that when the cursor hovers over the image card, and enlarge the card to ***220px*** of width instead of 100%. Return to normal when the cursor moves away using **`onMouseOut`**.

ROUTING MENU (20%)

(Tried in Lab 6) Add a navigation menu for routing within the page. Show *three* items:

- ***Home***: with path **`/`** should show component **`<Home/>`**
- ***Images***: with path **`/gallery`** should show component **`<Gallery/>`** (*i.e., basic image system*)
- ***Slideshow***: with path **`/slideshow`** should show a new component **`<Slideshow/>`**

When refreshing a page or typing in a URL with path directly, the correct routed component will be shown. Set up a **`<NoMatch/>`** component to catch all URL that cannot found.


- Home
- Images
- Slideshow

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SLIDESHOW (20%)

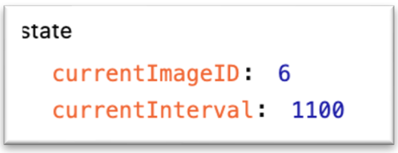
In component **`<Slideshow/>`**, display the following:

1. 4 buttons: Start slideshow, Stop slideshow, Slower, Faster
2. Image showing item `[0]` in the array
3. Image file name

Set up *four* event handlers to deal with the buttons when they are clicked:

- ***Start slideshow***: the next image (and filename) in the array should be shown one by one, and looping back to the beginning after each round (default interval: every 1500ms)
- ***Stop slideshow***: there should be no more change in the image
- ***Slower***: the changing interval would be increased by 200ms
- ***Faster***: the changing interval would be decreased by 200ms

  Note: the interval should not be decreased lower than 200ms



```
state
  currentImageID: 6
  currentInterval: 1100
```

There should be *at least* two state variables being changed to affect the React image display, e.g., **`currentImageID`** and **`currentInterval`**. They should be accessible in *Developer Tools » Components » … » Slideshow*. You may use more states if needed. *Note: State variables in functional components may not be shown properly.*

You may design the page layout to your liking, as long as all required items are clearly shown. We WILL NOT test the ***Slower*** and ***Faster*** buttons before starting the slideshow.

COMPONENT DIAGRAM (10%)

Inside **`<Home/>`**, display a ***tree diagram*** basing on the React components *created by you (excluding those from libraries e.g., `<Route/>`)* within **`app.jsx`**. The diagram should be a png/jpg image, and there is no limitation on the software to use for creating the diagram image. A clear hierarchical relationship must be shown. List also the ***props, states, and event handlers*** in each component.

CHALLENGE REQUIREMENTS (20%)

For ESTR2106 students: This part is compulsory! This assignment has a full score at 120%.

For CSCI2720 students: If you finish this part correctly, a 0.5% bonus will be given to the "Assignment" course assessment, which could go beyond its original 30% of assessments.

In <Home/>, show a short paragraph to briefly describe the work here, with ~100 words.

1. To enhance development, enable **`React.StrictMode`** for your `<App/>` component (with its children). See: https://reactjs.org/docs/strict-mode.html
2. Other than `<Slideshow/>`, all React components in the system must be built as React ***functional components***. Be careful with the use of props, states, and event handlers. *Yet, this is not required for the `<Slideshow/>` component.*
3. All the images in the `<Gallery/>` should be ***lazy loaded***. Please use the `IntersectionObserver` method, without using `loading="lazy"`. You may refer to an example here: https://codepen.io/chuckjee/pen/bGYmgeM. Instead of as an event handler for `DOMContentLoaded`, the observer setup can be implemented with `useEffect()` in `<Gallery/>`.

LIBRARIES, FEATURES AND FRAMEWORKS

You should be using the latest version of ***React*** and ***ReactRouter*** with no other libraries. They are already installed in Lab 6. Lab 5 has incorporated the use of ***Bootstrap***, to be added to the html file.

Other than anything specified, there is ***no cosmetic requirement*** for this assignment. You are welcome to implement extra styles and features at your own ability. It is fine for extra React components or different hierarchy from required in this document.

SUBMISSION

We will only visit your web page submission using ***Google Chrome*** (almost-latest versions) and React development server. Please utilize the ***Developer Tools*** with ***React Developer Tools*** for debugging of your code.

Plagiarism is heavily penalized. Do not attempt to share any code other than those given in labs. Please read this article carefully: *http://www.cuhk.edu.hk/policy/academichonesty*

Include your full name and student ID in ***all code files*** using comments, together with the required ***code header for honesty declaration***. Check that the file names and formats are correct. Zip your files *excluding CUHK images*, name it as `(SID)_asg2.zip`, e.g., *`1155000001_asg2.zip`*, and submit it on the course site on Blackboard. ***Only these files should be included:***

- 1 `.html` file
- 1 `.js`/`.jsx` file
- 1 diagram image
- `package.json` and `package-lock.json`

It is recommended to keep the folder structure from Lab 6.

Important: ***Remove the*** **`node_modules/`** ***and*** **`images/`** ***folders.*** We will use a similar set of images as in Lab 5 in an **`images/`** folder.

There is a late penalty of 10% in the first 72 hours of lateness. In the 72 hours after that, the penalty is 30%. The work will not be graded after more than 144 hours of lateness.