Report on Design Patterns and Rendering

Design Patterns:

- blueprints/template i.e solutions to solve the commonly occuring problem in software design.

- pre-made blueprints/template

- pattern consist of:

1. Intent (describes problem and solution)
2. Motivation (describes the solution that is possible by pattern)
3. Structure (show each part of pattern and how they are related)
4. Code example (to understand the idea behind the pattern

- Types:

1. Creational Design Pattern:

creating classes and objects (eg. Factory, Singletone, Abstract Factory)

2. Structural Design Pattern:

after creating classes and objects, we need to organize them in single structure which supports functionality

(eg. Build, Adaptive, composite)

3. Behavioural Design Pattern:

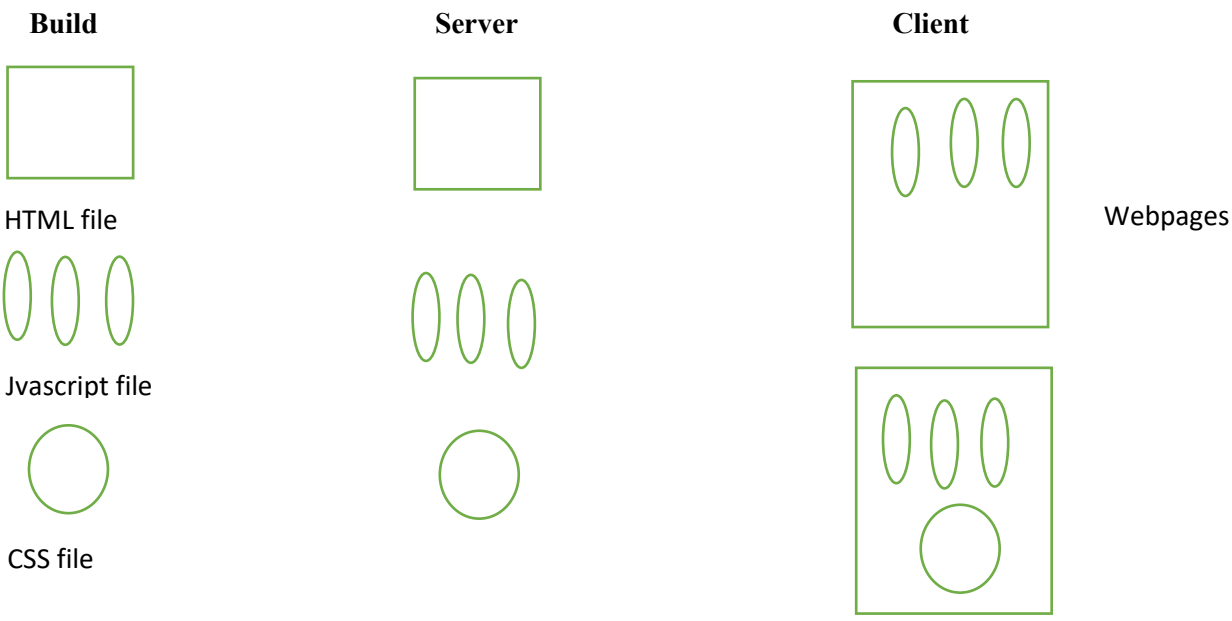
interaction between classes and communication between classes

(eg. Observer, strategy, interpreter

Rendering Patterns:

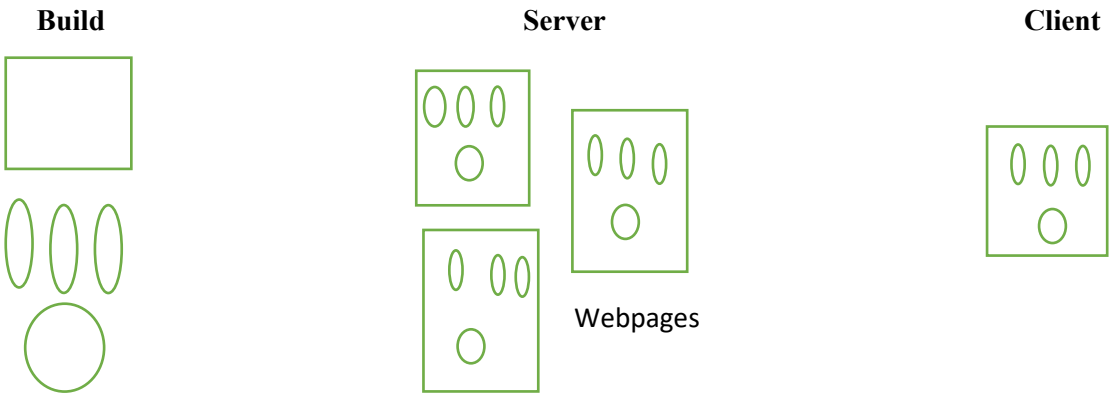
1. CSR (Client Side Rendering)

- In CSR, all the files are stored seperately i.e HTML, javascript, css files are stored seperately.
- When client request for webpage, then first it will load HTML file and then javscript and css files.
- That is, the creating or painting of webpage is done on client side.
- Rendering on client side.



2. SSR (Server Side Rendering)

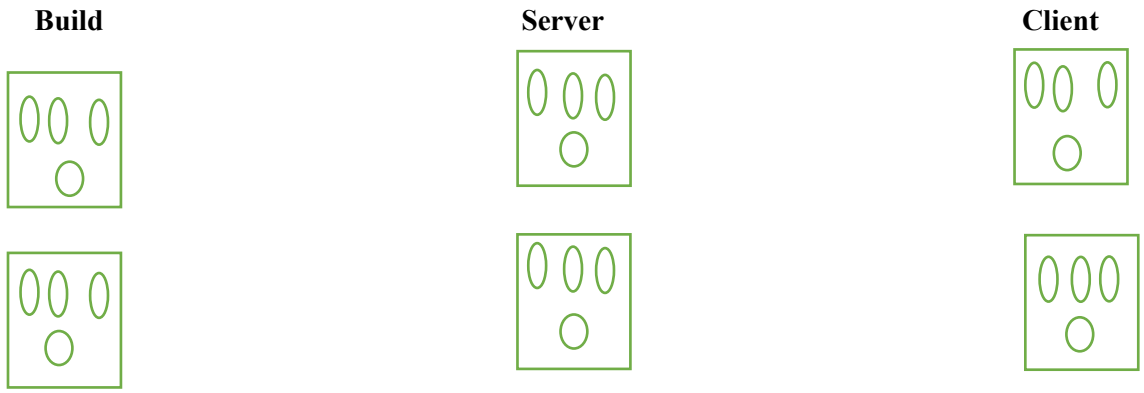
- In SSR, building of webpage is done on the server i.e webpage is created on server.
- When client request the webpage, the server will generate the required webpage and will send to client.
- Rendering on server side.
- Client need not to wait for paintinf th webpage.



3. SSG (Static Site Generation)

- In SSG, webpage is generated at build time and stored on server.

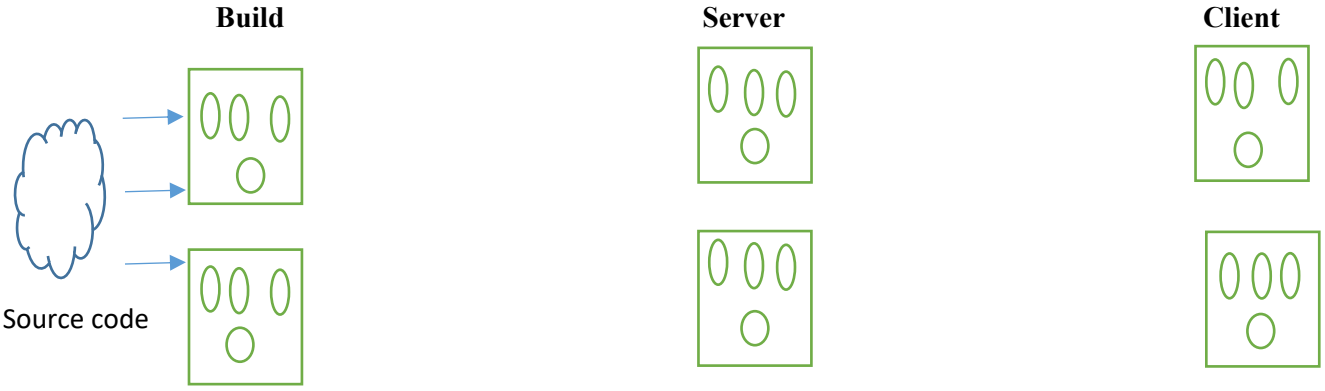
- it has advantage when there is no frequent changes on webpage.



4. ISR (Incremental Static Regeneration**)**

- You can control/decide the build phase.

- Like you can build the page after one hours, every 10 seconds .ucan decide your bud pahse.



- Parameters considered while cooding the rendering patterns:
  1. Build time
  2. Dynamic content
  3. Serach engine optimization
  4. Render time
  5. Content updation

1. CSR :

- Well-suited for dynamic, interactive web applications where updates and changes happen frequently.

- Single-page applications (SPAs) benefit from CSR as it loads initial content quickly, and subsequent updates are managed on the client side.

2. SSR :

- Suitable for content-heavy websites or applications that prioritize SEO, as the initial page is rendered on the server and sent to the client.

- E-commerce platforms, news websites, or any site requiring search engine optimization.

3. SSG :

- Ideal for content-focused websites with relatively static content, providing fast loading times.

- Blogs, documentation sites, or portfolios where content changes infrequently, and pre-building pages can enhance performance.

4. ISR :

- Websites with dynamic data that doesn't change too often but needs occasional updates. E-commerce product pages with stock information is a good example.