components such as typography, forms, buttons, modals, image carousels, navigation etc, as well as optional JavaScript extensions. Bootstrap provides the ability to create responsive designs faster and easier. The various factors which make Bootstrap a popular choice for CSS framework are as follows.

(i) All popular web browser support
(ii) Responsive design
(iii) Uniform Solution to build an interface
(iv) Functional built-in components

2) The Bootstrap 5 is the most recent version of the Bootstrap framework. There are two ways to include Bootstrap into JSP or HTML.
   (i) **Bootstrap through Content Delivery Network (CDN)**: Bootstrap CDN is an efficient and faster way to deliver the content from your website to the users. Bootstrap CDN speeds up the websites as CDN servers are intelligent enough to serve the resources based on proximity.
   (ii) **Offline or Downloading files locally**: Another approach to include Bootstrap is to directly download the Bootstrap CSS and JS files locally to the project folder and then include the local copy into JSP/HTML.

3) For the development environment, offline usage of Bootstrap is suitable. For the production environment, CDN is better, and the following obvious reasons support to prefer CDN configuration for Bootstrap-
   - CDN servers are intelligent enough to serve the resources based on proximity
   - They are super-fast at serving the content
   - The CDN network is spread across the world.
   - If you think that your server will challenge the above, then go for it

Check Your Progress 2

1) CSS is an extension of HTML that outlines specific stylistic instructions to style websites. CSS allows you to customize the look of your website and apply stylistic decisions across its entirety. CSS allows you to separate the style from the structure of a web page. CSS is used to specify the color of a heading or what font your content should be written in. To keep the style uniformly across the pages, a separate CSS file with any name e.g. custom.css can be created and custom styles can be added to this file. The custom CSScan be included at the top of each webpage inside the <head> tag using the below instruction.

```
<link rel="stylesheet" type="text/css" href="css/custom.css">
```

2) The below style instructions change all of the text within <p> tags on a page to red.

```
<head>
<style type="text/css">
 p
 {
    color: red;
 }
</style>
</head>
<body>
<p>
 This is Red Color Text.
```

```
</p>
<p>
This is another paragraph with red color.
</p>
</body>
```

3) Spring supports bootstrapping the Hibernate SessionFactory in order to set up the database using Hibernate. The database setup can be done with a few lines of Java code or XML configuration. Spring provides two key beans, in order to support the hibernate integration, available in the org.springframework.orm.hibernate5 package:
   - **LocalSessionFactoryBean**: creates a Hibernate's **SessionFactory ,**which is injected into Hibernate-based DAO classes.
   - **PlatformTransactionManager**: provides transaction support code for a **SessionFactory**. Programmers can use **@Transactional** annotation in DAO methods to avoid writing boiler-plate transaction code explicitly.

4) The Java configuration to integrate Hibernate with Spring is as follows.

```
packagecom.ignou.mvcapp;

@Configuration
@EnableTransactionManagement
@PropertySource(value = { "classpath:application.properties"
})
publicclassHibernateConfig
{

  @Autowired
  private Environment environment;

  @Bean
  publicLocalSessionFactoryBeansessionFactory()
  {
    LocalSessionFactoryBeansessionFactory =
newLocalSessionFactoryBean();
    sessionFactory.setDataSource(dataSource());
    sessionFactory.setPackagesToScan(newString[] {
"com.ignou.mvcapp.model" });
    sessionFactory.setHibernateProperties(hibernateProperties());
    returnsessionFactory;
  }

  @Bean
  publicDataSourcedataSource()
  {
    DriverManagerDataSourcedataSource =
newDriverManagerDataSource();
    // set datasource properties
    returndataSource;
  }

  private Properties hibernateProperties()
  {
    Properties properties = newProperties();
    //set Hibernate properties
    returnproperties;
  }
```

```
  @Bean
  publicPlatformTransactionManagergetTransactionManager()
  {
    HibernateTransactionManagerhtm =
newHibernateTransactionManager();
    htm.setSessionFactory(sessionFactory().getObject());
    return htm;
  }
}
```

Check Your Progress 3

1) Within computer programming, the acronym CRUD stands for CREATE, READ, UPDATE and DELETE. The CRUD paradigm is common in constructing web applications. While constructing the APIs, the model should provide four basic types of functionality such as Create, Read, Update and Delete the resources. CRUD operations are also often used with SQL.
It can also describe user-interface conventions that allow viewing, searching and modifying information through computer-based forms and reports. Most applications have some form of CRUD functionality. When programmers provide interactions with this database (often through stored procedures), the steps of CRUD, for a Student Management System, are carried out as follows:
   - Create: A new student is entered into the database.
   - Read: The student's information is displayed to the users.
   - Update: Already existing student's attributes are being updated with new values.
   - Delete: If the student is not part of the institute, the student can be deleted from the records.

2) CRUD to database SQL operation mapping with examples are as follows.

Function	SQL Statement	Example
C(reate)	Insert	Insert into student (name,grade) values('Prasoon',10);
R(ead)	Select	Select * from student
U(pdate)	Update	Update student set grade=10 where id=1;
D(elete)	Delete	Delete from student where id=1;

3) In REST context, CRUD corresponds to Rest web service POST, GET, PUT and DELETE respectively. The following table maps CRUD to REST with an example.

Function	Rest web service	Example
C(reate)	POST	POST http://teststudent.com/students/
R(ead)	GET	GET http://teststudent.com/students/
U(pdate)	PUT	PUT http://teststudent.com/students/1
D(elete)	DELETE	DELETE http://teststudent.com/students/1

8.9 REFERENCES/FURTHER READING

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