Q1. What is Struts? What are the features of Struts?

Ans. Struts is an open-source web application framework developed by Apache software Foundation, it is used to create a web application based on servlet and JSP.

- The main purpose of the struts framework is to provision separation of concerns between the business logic and presentation logic (view), making it easier to manage and develop large-scale web applications.

Features of Struts:-

1. Strut encourages good design practices and modeling because the framework is designed with 'time-proven' design patterns.

2. Struts is almost simple, so easy to learn and use.

3. It supports many convenient features such as input validation and internationalization.

4. It takes much of the complexity out as instead of building your own MVC framework, you can use struts.

5. Struts is very well integrated with J2EE.

6. Struts has large user community.

7. It is flexible and extensible; it is easy for the existing web applications to adapt the struts framework.

8. Struts provide good tag libraries.

9. It allows capturing input form data into JavaBean objects called Action forms.

10. It also hands over standard error handling both both programmatically and decoratively.

11. Struts also support utility classes.

Q2. Explain MVC with diagram in detail.

Ans. • The MVC (Model-View-Controller) framework is an architectural/design pattern that separates an application into three main logical components, model, view and controller.

• The MVC framework includes the following 3 components:-

1. **Controller:-**

• The controller is the component that enables the interconnection between the views and the model so it acts as an intermediary.

• The controller doesn't have to worry about handling data logic, it just tells the model what to do.
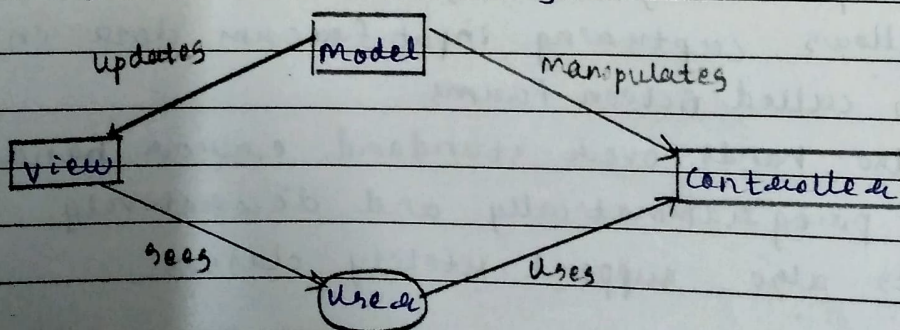
2. **View:-**

• The view component is used for all the UI logic of the application.

• It generates a user interface for the user.

3. **Model:-**

• The model component corresponds to all the data-related logic that the user works with.

• This can represent either the data that is being transferred between the view and Controller components or any other business logic-related data.

Q3. what are the main classes which are used on struts application?

Ans : The primary classes used on a struts application are:
ActionServlet, Action Form, Action, ActionForward and Action Mapping.

→ Explanation of each class:-

1. **Action Servlet:**
   - The core controller class that receives all incoming HTTP requests and determines which action class to execute based on the URL mapping defined on the struts-config.xml file.

2. **Action Form:**
   - A JavaBean class used to encapsulate form data submitted by the user, allowing for validation and data management before processing by the Action class.

3. **Action Forward:**
   - Represents the navigation information after an action is executed, specifying which JSP page to forward the request to.

4. **Action Mapping:**
   - A configuration element on the struts-config.xml file that maps a URL pattern to a specific Action class.

5. **Action:**
   - A Java class responsible for handling user requests, executing business logic.

Q4. How validation is performed in struts application?

Ans. Struts provides a built in validation framework that helps validates user input before processing the request.

- It ensures that only valid data is sent to the server improving security and user experience.

→ Validation in struts:-

1) Validation using validate () method in Action form.
- The validate () method is implement inside the Action Form class.
- This method is called automatically before executing the action.
- If validation fails, errors are added to an ActionErrors object, which is displayed on the UI.
- This method is useful for simple field level validation like checking of a field is empty or if value is within a specific range.

2) Validation using (validate ()) method in Action class.
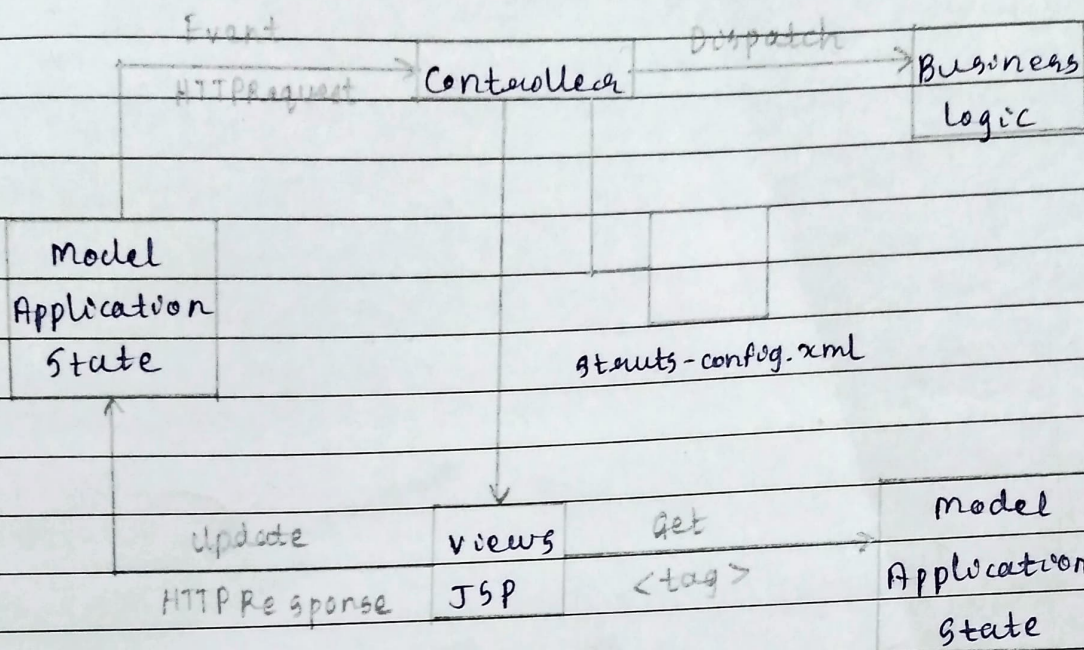- Similar to struts1, struts provides a validate() method in the Action Support class.
- This method is automatically executed before the execute() method in the action class.
- If validation fails error messages are stored and displayed to the users.
- This method is simple but may not be the best approach for complex validation logic.

- Validation also depends on both the validation and workflow interceptors.

Q5 Explain Struts Work flow with diagram.

Ans.

| Event | | | Dispatch | |
| HTTP Request → | Controller | | → | Business Logic |

Model
Application
State

Struts-config.xml

| Update | Views | Get | | model |
| HTTP Response | JSP | <tag> | → | Application State |

→ step 1: Initialization phase
- In this phase the controller rectifies a configuration file.
- This configuration file is like the manual for initialization and is used to display the controller layer objects.

→ Step 2: Composition of configuration file.
- Config files core is formed by all the objects defined inside it.
- These objects include action mapping which plays in defining the behaviour of the application.

→ Step 3: Routing of HTTP Request and process flow :-
- JSP does further processing and rendering the view page

→ Step 4: Action object request handling :-

- Action object handles all the request handing.