1. AngularJS Core Concepts

1] What is angularJs?

→

1. AngularJS is a Javascript framework, which is used to build a web applications.
2. AngularJS is a Simple Javascript framework used to create Single page web applications.
3. AngularJS is an open source project i.e you can freely use and share it.
4. AngularJS is client-Side Javascript framework.
5. AngularJS follows MVC architeture.
6. AngularJS was developed by misko and Adam Abrons in 2009.
7. AngularJS maintained by Google.

2] What are the Features of angularJS?

→

1. Data Binding - binding of data bet^n model & view Comp.
2. Scope - Scope in angularJS is the binding part of HTML a view and Javascript Controller.
3. Controller - It Controls data Flow within application.
4. Services - Services are set of tightly related function to Perform Specific task.
5. filters - These seleed a Subset of items from an array and returns a new array.
6. Routing - It is a Concept of switching view.
7. MVC - stands for model view controller.
8. Templets.
9. directives
10. dependency injection are the some features of angular JS

3] Write difference between Javascript and angularJS

→

Javascript	AngularJS
1. Javascript is an Object-oriented Scripting language	1. AngularJS is Open Source Scripting lang Used to create SPA.
2. It is Used to Create dynamic web application	2. it is Used to Create Single page web application
3. it was dereloped by netscape Communication	3. it was developed by Google
4. it's Syntax is Complex	4. it's Syntax is Simple
5. it is Complex to learn	5. it is Simple to learn
6. it does not Support filters	6. it Supports filters.
7. it is Fully featured language follows DOM (DOM i.e document object model	7. it follows MVC ie model view Controller architecture

4] Write down advantages and disadvantages of angular JS

→

* Advantages of angularJS

1. Build by Google - AngularJS has been developed as well as maintained by Google
2. Great MVC - MVC follows angular JS follows MVC architecture
3. Intuitive - AngularJS is more inuitive
4. Open-source - AngularJS is open-source projeet i.e it can easly freely share and use.
5. Comprehesive - AngularJS is Comprehesive Solution for rapid front-end development
6. Reusable - AngularJS provides reusable Components.
7. Angular JS create SPA

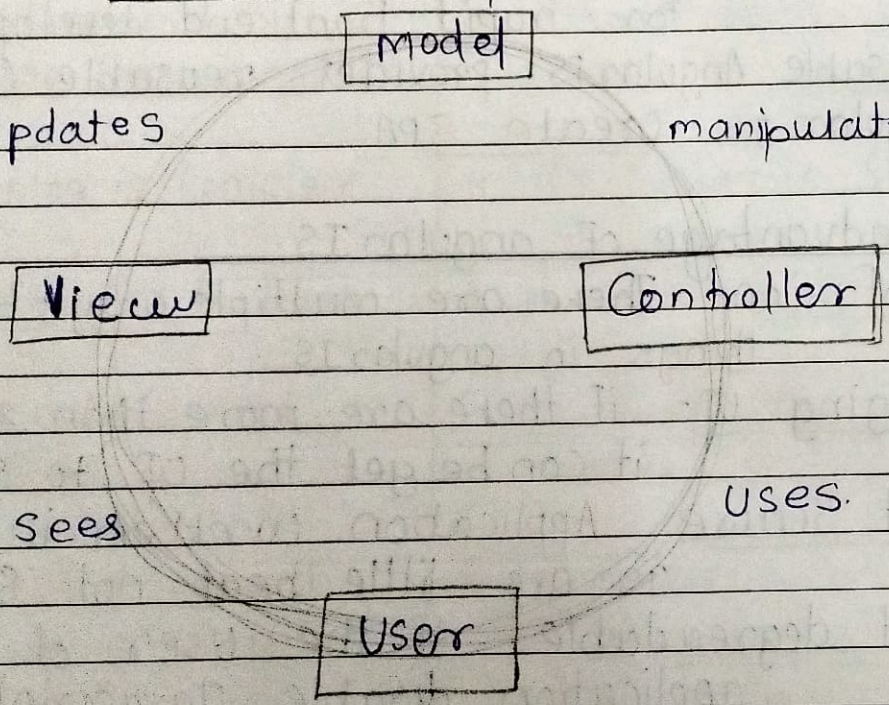
* Disadvantage of angularJS

1. Confusion - There are multiple ways to do a Same things in angularJS.
2. lagging UI - if there are more than 2000 watches. it can be get the UI to severla lag.
3. Not Secure - Application written in angular JS are little beat not Safe.
4. Not degreadable - if the user of your application disable Javascript, then nothing would be visible.
5. No specific way - it is very vast and Complex
6. Not Supported everywhere - Internet Explorer 8.0 doesn't Support Angular JS.

5) Explain MVC architecture

→

① MVC Stands For model view Controller
② MC MVC is a Software design patterm For developing web applications,
③ Angular Js Follows mvc architecture.
④ In MVC, application is Seprated into three main Components. i.e.
i. Model ii. View iii. Controller
⑤ MVC Prefer easy Code maintainence
⑥ MVC avoid Complexity by dividing application into three Components.

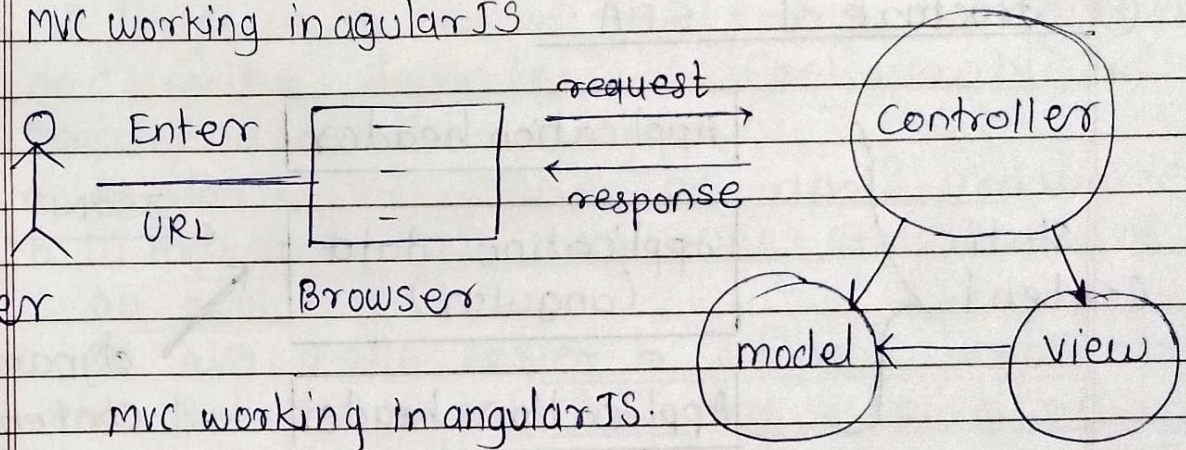


⑦ i) Model -
· model represents data
· model is premitive data type Suchas number, boolean, string etc.
· model respond to a request from view & and instruction from the Controller to Update it

ii) View :-
- View represents the html files which interact with aim users.
- it represents model data user.

iii) Controller :-
- it Controllers the instruction between model & view.
- The Controller represents the business logic.
- Controller accept input, validate it and then Performs the business opreations that modify the State of data model.
- it act as intermidiatry bet^n model & view.

⑧ MVC working in agular JS



MVC working in angular JS.

6) Explain SPA.

→

① SPA stands for Single page application
② SPA creates web application that fits on a Single page.
③ SPA retrived your all Code like (JS, HTML, CSS in Single page.

④ SPA avoid loading of full page and load only required meanigful data hence SPA very fast.

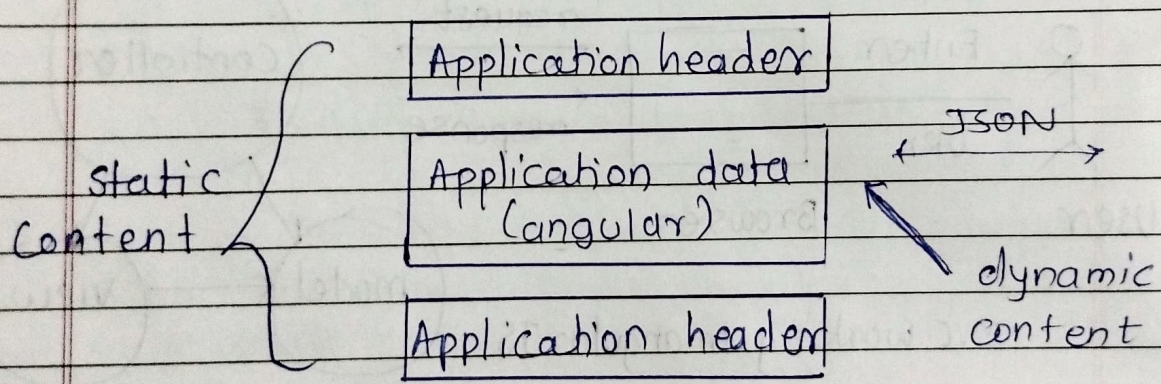
⑤ Advantage of SPA:

1. SPA is Good for making responsive website
2. it allows us to work offline
3. Provides better expreinse to user

⑥ disadvantage of SPA

1. The initial loading is quite slow.
2. it is Complex to build and develop
3. client should have JS enable.

⑦ Structure of SPA:



2. Angular JS Directives and Expressions.

Q What is data binding in angular JS Explain.

→ 1. Data binding in angular JS is the Synchronization between model & view.
2. Data binding is the very useful and powerful Feature used in Software development technologies.
3. Data binding acts as bridge between view and buiseness logic of the application
4. There are two types of data binding
   1) One-way Data binding
   2) Two-way Data binding.

Q What are expressions in angularJS explain with example.

→
1. Angular JS Bind data to HTML Using expression
2. Expression are used to bind the application data to html.
3. In angular JS expression are written in double curly braces : {{ expression}}
4. Angular JS expression Can Contain filters, Operators, Variables.
5. Example of expression.

```
<html>
<script src="path"></script>
<body ng-app="">
<p>my first expression</p>
<p>Add 3 and 9 {{3+9}}</p>
</div>
</body>
</html>
```

Q. What is ment by directives in angularJS.

→

1. Directives are one of the most important Component of angular JS application
2. Directives is a rule for defining how your UI interacts with data binding
3. Directives are special attributes starting with ng-prefix.
4. Directives : In angular JS there are many built-in directives such as
   1) ng-app
   2) ng-model
   3) ng-show
   4) ng-reapet etc.
5. In addⁿ, you can create Custom attributes for your application.

Q. Explain Various angular JS directives with example

→

I ng-app

1. ng-app directive is the beginning directive of angular JS
2. This directive initialize angular JS application.
3. it is a start line point of angular JS application
4. it defines root element of anj application
5. It automatically initialize and boostrap the application.
6. it Controls the whole dom hirearchy
7. it is also used to load various angular JS modules in anj application.
8. it tells angular js that this is an angular JS application.

9 Program to demostrate ng-app directive.

```
<html ng-app>
<head>
<script src="http://ajax.googleapis.com/ajax/
  libs/angularjs/1.6.9/angular.min.js">
</script>
</head>
<body>
<h1> Hii all welcome you all !</h1>
<h2> first Program </h2>
</body>
</html>
```

II. ng-init

① ng-init directive used for initialize variable in angular JS application.

② Program to demostrate ng-init directive

```
<html>
<Script src="https://ajax.googleapis.com/
  ajax/libs/angular/~~min.js~~1.8.2/
  angular.min.js"></Script>

<body ng-app="">
<div ng-init="pname='Book'; price=20;">

  Product Name = {{ pname}} <br>
  Price = {{ price}} <br>

</div>
</body>
</html>
```

③ ng-init is used to initializing the local data from our applications.

III ng-click

① ng-click directive Used to define angular click event from html element.

② This directive define a angular JS click event.

```
<html>
<Script Src = "path"></Script>
<body ng-app = "mainApp">
<div ng-Controller = "mainCtrl">
<P> Click Button </P>
<input type = "button" ng-click = "myfun()">
<P> Button has been clicked {{clicked}}
  {{count}} </P>
</div>
<Script>
   Var app = angular.module ('mainApp', []);
app.controller ('mainCtrl', [ '$scope', function
     ( $scope)
{
  $scope.Count = 0;
  $scope.myfun = function()
  {
     $scope.count++;
  }
}]);
</Script>
</body>
</html>
```

IV. ng-show-

- ng-show directive is used to hide or show the given html element.

- Program to demostrate ng-show directive.

```
<html>
<script src="https://ajax.googleapis.com/ajax/
  libs/angularjs/1.8.2/angular.min.js">
</script>

<body ng-app="">
<input type="checkbox" ng-model="show-demo">

<div ng-show="show-demo">
 <p> Welcome here</p>
 </div>
</body>
</html>
```

V ng-repeat -

1. ng-repeat is used to repeat the set of html code for number of times.
2. it is mostly used with array or object
3. Program to demo ng-repeat directive

```
<html>
<script src="https://ajax.googleapis.com/ajax/
  libs/angularjs/1.8.2/angular.min.js">
</script>

<body ng-app="">
<div ng-init="num=[11,12,13]">
<ol>
<li ng-repeat="n in num">
  <span> {{n}} </span>
</li>
</ol>
</div>
</body>
</html>
```

VI. ng-disabled-

① ng-disabled directive ~~to~~ used in angular js used to disable or unable html element.

② Program to demostrate ng-~~d~~disabled directive :-

```
<html>
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.8.2/angular.min.js">
</script>

<body ng-app="">
Click here to disable all the form fields: <input type="checkbox" ng-model="all"> <br>
<br>
<input type="text" ng-disabled="all">
<input type="radio" ng-disabled="all">
<select ng-disabled="all">
<option> Female </option>
<option> Male </option>
</select>
</body>
</html>
```

VII ng-bind.

1. This directive in angularJS Used to replace or attached the value.

2. Program to demostrate ng-bind

```
<html>
<script src="https://ajax.googleapis.com/ajax/libs/angular.js/1.8.2/angular.min.js">
</script>

<body ng-app="">
<div>
<P> Enter your City </P>
<input type="text" ng-model="city">

<P> your enterend city is = <span ng-bind="city"></span> </P>

<P> Your Entered city = {{ city }} </P>
</div>
</body>
</html>
```

VIII ng-model.

1. This directive Used to bind html value to properly on the dollarscope object.

2. Program to demostrate.

```
<html>
<Script src = "https://ajax.googleapis.com/
  ajax/libs/angular.js/1.8.2/angular.
min.js">
</script>
<body ng-app>
<input type = "text" ng-model = "name" />
<div>
 Hello <h2> {{ name}} </h2>
 </div>
</body>
</html>
```

IX ng-if :-

1. This directive is used for removing or repeating html element based on expression.

2. Syntax :-

```
<element ng-if = " expression "></element>
```

X ng-controller.

① ng-controller used to control data flow within the application.

② Each Controller accepts $scope as a Parameter.

③ Using Controller data is taken from view part as an input then it process given data and send back to view part that being showed to user.

④ Program to demostrate ng-controller :-

```
<html>
<script src="https://ajax.googleapis.com/
ajax/libs/angularjs/1.8.2/angular.
min.js">
</script>

<body ng-app="myApp">

<div ng-controller="myCtrl">
  {{ message }}
</div>
<script>
   var App = angular.module('myApp',[]);

App.controller('myCtrl', function ($scope)
 {
   $scope.message="..Welcome you all";
});
</script>
</body>
</html>
```

ng-app
ng-init
ng-click
ng-show
ng-bind
ng-repeat
ng-model
ng-if
ng-disabled
ng-controller

3. AngularJS. Modules, Controller View and Scope.

Q. What are modules? Explain.

→

① Module is a Component of MVC architecture which is used to create angular applications.

② A module can define its own Controller, Services & directive.

③ Angular JS supports MVC architecture.

④ Module serves as Container of different parts of your appl^ such as Controllers, Services, filters, directives etc.

⑤ **Syntax:-**

```
angular.module('module-name', []);
```

⑥ **Example:-**

```
Var app = angular.module('mainApp', []);
app.controller('mainCtrl', function()
{
    // write logic code

});
```

⑦ **Advantages of module:-**

i. it is easyl testeble tasteble Component.
ii. it is easily maintainable.

iii. This process of declaration is easy to Understand.
iv. Using modules you can easily Organize your application.

Q. What are Controller in Angular JS.

→

① In every angularjs application the Controller is the heart of the application
② angularjs application is depends on the Controller that Controls the flow of data in the applications.
③ In angularjs Controller can be define Using ng-controller directives
④ A Controller Controls the flow of data from the model part to the view part.
⑤ A Controller is a javascript Object that Contain attributes, properties and functions.

⑥ Syntax :-

```
Variable_Name.Controller('name-of-
                Controller',
        function ($scope))
```

⑦ Example :-

```
Var app = angular.module('mainApp',[]);
app.controller('mainCtrl', function ($scope))
```

Q. What is View Explain?

→

1. The view is the UI that the user Sees and interacts with.
2. View are Same as Virtual DOM.
3. Angular JS is also known Single page applications it means multiple View are displayed on Single page without reloading the page.
4. The new page is displayed on the Current page itself, for this purpose angular js provided ng-view directives.
5. Syntax :-

```
<div ng-app = "mainApp">
<ng-view></ng-view>
</div>
```

6. Example :-

```
<html>
<script src = "https://ajax.googleapis.com/
ajax/libs/angularjs/1.8.2/angular.
min.js"></script>

<body ng-app = "myApp">

<div ng-controller = "myController">

<h1> I have Completed view part </h1>
<a href = "Page1.html"> page-1 </a>
```

```
<a href="Page2">page2.html">page-2
</a> <br>

<div class = "viewCtrl">
<div ng-view></div>
</div>
</body>
</html>
```

Q. What are Scope in angularJS?

→

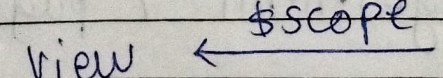
① Scope in AngularJS is the binding part of html view and Javascript Controller.

② Syntax - $scope , $rootscope

Q. Explain Scope hierarcy in details.

→ Scope is hierarcy feature

1. The feature of Scope is that they are Organised in hierarcy
2. hierarcy helps to keep Scope are organised.
3. The Scope hierarcy is Created auto-matically based on ng-controller.
4. We Can access the Value of parent Scope of the Controller but we Can not the access the Value of child Scope
5. There are two types of scope
   1. $scope 2. $rootscope



4. Filter, Forms and ajax filters.

Q. What are Filters?

→

1. In angular JS filter are Used to filter or format the data acc^{n} to User requirements.
2. Filter Can do 3 things format, sort and filter the data.
3. Filter Can Used within Controller, Services and directives.
4. Filter generally used for format or Sort the data.
5. To apply Filter (|) pipe character Operator is Used.

{{ expression | filter Name : Parameter }}

6. Syntax. {{ expression | filter Name : parameter }}
7. There are two types of filters
   i. Built-in filters ii Custom filters

Q. List & Built in filters explain.

→

i. Lowercase :- LowerCase filter Convert string into lowercase

{{ expression | lowercase }}

ii. Uppercase :- Uppercase filter Convert string into Uppercase

{{ expression | Uppercase }}

> Example of lowercase filter

→

```
<html>
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.8.2/angular.min.js"></script>
<body ng-app="myApp" ng-controller="myCtrl">

<form>
Enter your name<input type="text" name="fname" ng-model="fname">

<br>
Lowercase = {{ fname|lowercase }}
</form>
<script type="text/javascript">
var app = angular.module('myApp',[]);
app.controller('myCtrl', function ($scope)
{
    $scope.fname ="SAKSHI";
});
</script>
</body>
</html>
```

classmate
Date
Page

> Example of Uppercase filter.

→

```
<html>
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.8.2/angular.min.js"></script>

<body ngapp="myApp" ng-controller="myctrl">

<form>
Enter your name< input type="text" name
="fname" ng-model="fname"> <br>

Uppercase = {{ fname| uppercase}}
</form>
<script type="text/javascript">

Var app = angular.module('myApp', []);
app.Controller('myctrl', function ($scope)
{
    $scope.fname ="pune";
});
</script>
</body>
</html>
```

iii. Date filter -

① Date filter is used to convert date into specific format.

② When the date format is not specified the default date format is "MMM d, yyyy"

③ Syntax = {{ expression | date: format: time zone }}

④ Format of Date :-

i. yyyy - 4 digit year like (2020)
ii yy - 2 digit year like (20)
iii MMMM - full month name like (deeember)
iv MMM - 3 character of month like (dec)
v. MM - 2 digit month like (1/11/2020)
vi dd - 2 digit date like (01/11)
vii d - 1 digit date like (1/11)

⑤ Example of Date filter.

→

```
<html>
< Script src = "path" > </ script>

{ body ng-app = "myApp" ng-controller = "my
    Ctrl" >
< script >
```

```
var app = angular.module('myApp',[]);
app.controller('myctrl', function ($scope)
    {
        $scope.today = new Date();
    });
</script>
<p> Date = {{ today | Date}} </p>
<p> short Date = {{ today | date: 'short'}}
</p>
Long Date = {{ today | date : 'longDate'}}

year = {{ today | date : 'yyyy'}}

</body>
</html>
```

iv. Number filter-

① In angular Is number filter is Used to format the number and Convert it as text.

② Number filter is Used to display a number with decimal value.

③ We define a limit of decimal value.

④ Syntax :- {{ expression /number : Faetor size }}

⑤ Programm :-

```
<html>
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.8.2/angular.min.js"></script>
<body ng-app>
    Enter amount =<input type="number" name="amount" ng-model="amount">
<br><br>

10000 | number = {{10000 | number}} <br>
amount | number = {{ amount | number}} <br>
amount | number2 = {{ amount | number:2}} <br>
amount | number4 = {{ amount | number:4}} <br>
amount | number = <span ng-bind="amount | number"></span>
</body>
</html>
```

11) Currency filter :-

① Currency filter is Used to display a number in Currency format

② Syntax :-

{{ expression | filter.name }}

③ Program :-

```
<html>
<script src="https://ajax.googleapis.com/ajax/angularjs/1.8.2/angular.min.js">
</script>
<body ng-app="myApp" ng-controller="myCtrl">

Enter Fees <input type="number" ng-model="num">

<p> Fees in Currency = {{ num | currency : "Rs" }} </p>
<script>
    var app = angular.module('myApp', []);
app.controller('myCtrl', function($scope)
    {
        $scope.num = " ";
    });

</script>
</body>
</html>
```

vi) OrderBy Filter :-

① OrderBy Filter is Used to Sort the array with give expression

② Syntax :- {{ array | orderBy : reverse }}

③ Program : Program is remaining.

vii) Filter - Filter :-

① Angular Filter is Used to filter the array of object element and returned the filter element.

② Syntax :

{{ expression | filter : expression : Comparator : any propertykey }}

5. Dependency Injection, Services.

Q. What is dependency Injection / Explain?

→

1. DI is one of the best Feature of angular JS.
2. DI is a Software design pattern in which Object are passed as dependencies
3. DI is a software design pattern which Specifies how Components get hold for their dependencies.
4. It Facilitates us to divide our application into multiple different type of Components which Can be injected into each other as dependency.
5. DI helps us to remove hard coded dependencies and make dependencies Configurable.
6. Uses of dependency injection.
   a. Angular JS DI make an appl^n modulinze.
   b. DI make it easy to reuse Component of an appl^n.
   c. DI also make easier to Configure Components and test Components of an application.
7. There are 4 Components of DI :-

I. Value :-

- It is Simple Javascript object
- which is required to pass Value to the Controller, Services.
- It Consits 2 parameters 1st Name of Value and 2nd assign value

- Syntax :-

Module.value(name, value);
example -

```
Var num = angular.module("myApp", []);
num.value("id", 101);
num.Controller("myCtrl", function($scope.id));
```

II. Factory :-

- Factory is Function which Process Value and return output.
- Factory function is used to return Value on demand.
- It return value on basis of requirement made by Services and Controllers.

III. Services :-

- It is Singleton Java object Containning a set of functions to perform Certain tasks.
- it is defined Using Service() function and injected into Controller.

IV. Provider :-

- It is Used by angularJS internally to create Services, Factory etc during the Configuration phase.

Q. What is / explain Services? and its type?

→

① AngularJS Services is a Set of tightly related functions.
② Services in angular JS is function that can be used to share data across the appl^n.
③ Services in angularJS are Objects that are Wired together using DI and it is Used to share and organize Code across the appl^n.
④ Services are defined using Services() functions.
⑤ Services is a Javascript Object which Contains a set of functions to perform Certain tasks.
⑥ Services Provides us method to keep data across lifetime of the angular app.
⑦ It Provide us method to communicate data across Controller in a Consistent way
⑧ Type of Services:-

I. Buil-t-in Services :-

- AngularJS provides Serval built-in Services which Can be Used easily in the program.
- These buil-in Services are automatically registered in the dependency injector.
- Angular JS Provide various built-in Services for eg $window, $location, $timeout, $interval, $root etc.

II. Customs Serveces :- We can create our own services and Connelt it to module these are reffered as Custom Services.

Q. Explain Various Built-in Services ?

→

I) $window Service :- Angular JS include $window Services which refers to the browser window object.

II) $location Service :- location Service has methods with return information about location of Current web page.

Program -

```
<html>
<script src = "path"></script>
<body>
<div ng-app = "myApp" ng-controller = "myCtrl">
<p> The Url of this Page is :</p>
<h3> {{ text }} </h3>
</div>
<script>
Var app = angular.module ('myApp', []);
app.controller ('myCtrl', function ($scope,
    $location) {

  $scope.text = $location.absUrl();
});

</script>
</body>
</html>
```

III) $interval Services:- This service executes specified function on every specified milliseconds durations.

Program -

```
<html>
<head>
<script src="path"></script> </head>
<body ng-app="myApp">
<div ng-controller="myCtrl"> Counter
  will increment after two Seconds:/
{{ counter }} </div>

<script>
 Var myApp = angular.module ('myApp', []);
myApp.controller ('myCtrl', function ($scope,
      $interval) {

  $scope.counter = 0;
  Var increaseCounter = function () {
  $scope.Counter = $scope.counter + 1;
  }
   $interval (increaseCounter, 2000);
});

</script>
</body>
</html>
```

IV. $timeout Services :- This Service of angular Js allows the developer to Set Some time delay before excution of function

Program -

```
<html>
<head>
<script src = "http://ajax.googleapis.com/
  ajax/libs/AngularJs/1.6.9/angular.min.js"
></script>
<script type = "text/
</head>
<body ng-app = "myApp">
<div ng-Controller = "myCtrl">

This Counter will increased by 2000 millisec
{{ mess }}
</div>
<script>
  var app = angular.module('myApp',[]);
app.controller('myCtrl', function( $scope,
      $timeout )
  {
     $timeout ( function(){
  {
    $scope.mess = " Do not share your password
        and Username with anybody";
  }, 2000);
});
  </script>
  </body>
  </html>
```

V. $filter Service :- This Service is Used for formatting the data displayed to the user.
Syntax :- $filter('uppercase')($scope.name);
$filter('currency')($scope.salary);

VI. $document Service :- This Services returns JQuery collection that Contains document object and its Properties.

VII. $log Service :- This Service is Used to write errors.
Syntax - $log.log('message');

VIII. $root Service :- This is the element where ng-app ~~is~~ was declared. The element represents the root element of application.

Q. What is angular JS Factory Explain?

→

1. Factory is a Function that creates a value.
2. Factory creates value on demand.
3. Created value is reused for all services, Controller etc.
4. A factory is an injectable Function.
5. Syntax :-

```
module.factory('Demoservice', function(){
  var factory = {};

factory.firstMethod = function(){
  .....
  .....
}
```

```
factory.secondMethod = function(){
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}
return factory;
});

module.factory(name, function(dependencies)
  {...});
```