You can use call()/apply() to invoke the function immediately. bind() returns a bound function that, when executed later, will have the correct context (**"this"**) for calling the original function. So bind() can be used when the function needs to be called later in certain events when it's useful

What is Angular and Why Angular?

Angular (2/4/5/6) is not a programming language like Javascript or Typescript. Angular is a front-end or client-side Framework, which needs a [programming](https://www.greycampus.com/programming) language like Typescript (developed by Microsoft).

what does it mean when one says, "Angular is a client-side framework"? It means that it runs on the client-side or user's browser and not on a Web Server (where java/python/ruby/vb.net run). Of course, there is the Angular Universal which allows Angular to run on a server; but, primarily, angular is a client-side framework. Angular is a product developed and maintained by the techie giant Google and has adopted the SPA (Single Page Application) principles.

### 1. What’s new in Angular 5?

* Angular 5 supports Typescript version 2.4
* Angular 5 supports RxJS 5.5 which has new features like Pipeable Operators
* A build tool to make the js bundles (files) lighter
* Ahead of Time (AOT) is updated to be on by default
* Events like ActivationStart and ActivationEnd are introduced in Router

### 2. Name the building blocks of Angular.

The Angular application is made using the following:

Modules

Component

Template

Directives

Data Binding

Services

Dependency Injection

Routing

### 3. What is Transpiling in Angular?

Transpiling is the process of converting the typescript into javascript (using Traceur, a JS compiler). Though typescript is used to write code in the Angular applications, the code is internally transpiled into javascript.

### 4. Which of the Angular life cycle component execution happens when a data-bound input value updates?

ngOnChanges is the life cycle hook that gets executed whenever a change happens to the data that was bound to an input.

### 5. Differentiate between Components and Directives in Angular 5.

Components break up the application into smaller parts; whereas, Directives add behavior to an existing DOM element.

### 6. What is the use of @Input and @Output?

When it comes to the communication of Angular Components, which are in Parent-Child Relationship; we use @Input in Child Component when we are passing data from Parent to Child Component and @Output is used in Child Component to receive an event from Child to Parent Component.

### 7. What is ng-content Directive?

The HTML elements like p (paragraph) or h1 (heading) have some content between the tags. For example, <p>this is a paragraph</p> and <h1>this is a heading</h1>. Now, similar to this, what if we want to have some custom text or content between the angular tags like  <app-tax>some tax-related content</app-tax> This will not work the way it worked for HTML elements.  Now, in such cases, the <ng-content> tag directive is used.

### 8. What does a router.navigate do?

When we want to route to a component we use router.navigate.  Syntax: this.router.navigate([‘/component\_name’]);

### 9. What is ViewEncapsulation?

ViewEncapsulation decides whether the styles defined in a component can affect the entire application or not. There are three ways to do this in Angular:

Emulated: styles from other HTML spread to the component.

Native: styles from other HTML do not spread to the component.

None: styles defined in a component are visible to all components.

### 10. What are Services in Angular and what command is used to create a service?

Services help us in not repeating the code. With the creation of services, we can use the same code from different components. Here is the command to create a service in angular, ng g service User (a UserService is created when this command is used).

### 11. What is Dependency Injection in Angular 4?

When a component is dependent on another component the dependency is injected/provided during runtime.

### 12. What is Routing in Angular 5?

Routing helps a user in navigating to different pages using links.

### 13. How to handle Events in Angular 5?

Any activity (button click, mouse click, mouse hover, mouse move, etc) of a user on a frontend/web screen is termed as an event. Such events are passed from the view (.HTML) page to a typescript component (.ts).

### 14. What is a RouterOutlet?

RouterOutlet is a substitution for templates rendering the components. In other words, it represents or renders the components on a template at a particular location.

### 15. Explain the usage of {{}}?

The set of brackets {{}} when used with an HTML tag, represent data from a component. For example, on a HTML page which has <h1>{{variableName}}</h1>, here the ‘variableName’ is actually typescript (component) data representing its value on the template; i.e., HTML. This entire concept is called String Interpolation.

### 16. In how many ways the Data Binding can be done?

Data Binding happens between the HTML (template) and typescript (component). Data binding can be done in 3 ways:

(i) Property Binding (ii) Event Binding (iii) Two-Way Data Binding.

### 17. What is the sequence of Angular Lifecycle Hooks?

OnChange()  -  OnInit()  -  DoCheck()  -  AfterContentInit()  -  AfterContentChecked()  -  AfterViewInit()  -  AfterViewChecked()  -  OnDestroy().

### 18. What is the purpose of using package.json in the angular project?

With the existence of package.json, it will be easy to manage the dependencies of the project. If we are using typescript in the angular project then we can mention the typescript package and version of typescript in package.json.

### 19. How is SPA (Single Page Application) technology different from the traditional web technology?

In traditional web technology, the client requests for a web page (HTML/JSP/asp) and the server sends the resource (or HTML page), and the client again requests for another page and the server responds with another resource. The problem here is a lot of time is consumed in the requesting/responding or due to a lot of reloading. Whereas, in the SPA technology, we maintain only one page (index.HTML) even though the URL keeps on changing.

### 20. What is Component in Angular Terminology?

A web page in Angular has many components involved in it. A Component is basically a block in which the data can be displayed on HTML using some logic usually written in typescript.

### 21. What are ngModel and how do we represent it?

ngModel is a directive which can be applied on a text field. This a two-way data binding. ngModel is represented by [()]

### 22. What does a Subscribe method do in Angular 4?

It is a method which is subscribed to an observable. Whenever the subscribe method is called, an independent execution of the observable happens.

### 23. Differentiate between Observables and Promises.

Observables are lazy, which means nothing happens until a subscription is made. Whereas Promises are eager; which means as soon as a promise is created, the execution takes place. Observable is a stream in which passing of zero or more events is possible and the callback is called for each event. Whereas, promise handles a single event.

### 24. What is an AsyncPipe in Angular?

When an observable or promise returns something, we use a temporary property to hold the content. Later, we bind the same content to the template. With the usage of AsyncPipe, the promise or observable can be directly used in a template and a temporary property is not required.

### 25. Explain Authentication and Authorization.

Authentication: The user login credentials are passed to an authenticate API (on the server). On the server side validation of the credentials happens and a JSON Web Token (JWT) is returned. JWT is a JSON object that has some information or attributes about the current user.  Once the JWT is given to the client, the client or the user will be identified with that JWT.

Authorization: After logging in successfully, the authenticated or genuine user does not have access to everything. The user is not authorized to access someone else’s data,  he/she is authorized to access some data.

### 26. What is AOT Compilation?

Every angular application gets compiled internally. The angular compiler takes javascript code, compiles it and produces javascript code again. Ahead-of-Time Compilation does not happen every time or for every user, as is the case with Just-In-Time (JIT) Compilation.

### 27. What is Redux?

It is a library which helps us maintain the state of the application. Redux is not required in applications that are simple with the simple data flow, it is used in Single Page Applications that have complex data flow.

### 28. What are the Pipes?

This feature is used to change the output on the template; something like changing the string into uppercase and displaying it on the template. It can also change Date format accordingly.

### 29. Differentiate between ng-Class and ng-Style.

In ng-Class, loading of CSS class is possible; whereas, in ng-Style we can set the CSS style.

### 30. Why Typescript with Angular?

Typescript is a superset of Javascript. Earlier, Javascript was the only client-side language supported by all browsers. But, the problem with Javascript is, it is not a pure Object Oriented Programming Language. The code written in JS without following patterns like Prototype Pattern becomes messy and finally leading to difficulties in maintainability and reusability. Instead of learning concepts (like patterns) to maintain code, programmers prefer to maintain the code in an OOP approach and is made available with a programming language like Typescript was thus developed by Microsoft in a way that it can work as Javascript and also offer what javascript cannot ie;

* pure OOPS as Typescript offers concepts like Generics, Interfaces and Types (a Static Typed Language) which makes it is easier to catch incorrect data types passing to variables.
* TS provides flexibility to programmers experienced in java, .net as it offers encapsulation through classes and interfaces.
* JS version ES5 offers features like Constructor Function, Dynamic Types, Prototypes. The next version of Javascript ie ES6 introduced a new feature like Class keyword but not supported by many browsers.
* TS offers Arrow Functions (=>) which is an ES6 feature not supported by many browsers directly but when used in TS, gets compiled into JS ES5 and runs in any browser.
* TS is not the only alternative to JS, we have CoffeeScript, Dart(Google).
* Finally, it is like, TS makes life easier when compared to JS.

**Question**: **Demonstrate navigating between different routes in an Angular application.**  
**Answer**: Following code demonstrates how to navigate between different routes in an Angular app dubbed “Some Search App”:

import {Router} from "@angular/router";

.

.

.

@Component({

 selector: 'app-header',

 template: `

<nav class="navbar navbar-light bg-faded">

 <a class="navbar-brand" (click)="goHome()">Some Search App</a>

 <ul class="nav navbar-nav">

   <li class="nav-item">

     <a class="nav-link" (click)="goHome()">Home</a>

   </li>

   <li class="nav-item">

     <a class="nav-link" (click)="goSearch()">Search</a>

   </li>

 </ul>

</nav>

`

})

class HeaderComponent {

 constructor(private router: Router) {}

 goHome() {

   this.router.navigate(['']);

 }

 goSearch() {

   this.router.navigate(['search']);

 }

}

**Question**: **Enumerate some salient features of Angular 7.**  
**Answer**: Unlike the previous versions of Angular, the 7th major release comes with splitting in @angular/core. This is done in order to reduce the size of the same. Typically, not each and every module is required by an Angular developer. Therefore, in Angular 7 each split of the @angular/core will have no more than 418 modules.

Also, Angular 7 brings drag-and-drop and virtual scrolling into play. The latter enables loading as well as unloading elements from the DOM. For virtual scrolling, the latest version of Angular comes with the <cdk-virtual-scroll-viewport> package. Furthermore, Angular 7 comes with a new and enhanced version of the ng-compiler.

**Question**: **Explain Angular Authentication and Authorization.**  
**Answer**: The user login credentials are passed to an authenticate API, which is present on the server. Post server-side validation of the credentials, a JWT (JSON Web Token) is returned. The JWT has information or attributes regarding the current user. The user is then identified with the given JWT. This is called authentication.

Post logging-in successfully, different users have a different level of access. While some may access everything, access for others might be restricted to only some resources. The level of access is authorization.

Here is a detailed post on Angular 7 – JWT Authentication Example & Tutorial: http://jasonwatmore.com/post/2018/11/16/angular-7-jwt-authentication-example-tutorial

**Question**: **How to generate a class in Angular 7 using CLI?**  
**Answer**:

ng generate class Dummy [options]

This will generate a class named Dummy.

**Question**: **How do Observables differ from Promises?**  
**Answer**: As soon as a [promise](http://andyshora.com/promises-angularjs-explained-as-cartoon.html) is made, the execution takes place. However, this is not the case with observables because they are lazy. This means that nothing happens until a subscription is made. While promises handle a single event, observable is a stream that allows passing of more than one event. A callback is made for each event in an observable.

**What should replace the “?”?**  
**Answer**: Directives. The image represents the types of directives in Angular; Attribute, structural, and custom.

**Question**: **What are the building blocks of Angular?**  
**Answer**: There are essentially 9 building blocks of an Angular application. These are:

1. **Components –** A component controls one or more views. Each view is some specific section of the screen. Every Angular application has at least one component, known as the [root component](https://www.learnhowtoprogram.com/javascript/angular/angular-2-setup-root-component-root-module-and-more). It is bootstrapped inside the main module, known as the root module. A component contains application logic defined inside a class. This class is responsible for interacting with the view via an API of properties and methods.
2. **Data Binding –** The mechanism by which parts of a template coordinates with parts of a component is known as data binding. In order to let Angular know how to connect both sides (template and its component), the binding markup is added to the template HTML.
3. **Dependency Injection (DI) –** Angular makes use of DI to provide required dependencies to new components. Typically, dependencies required by a component are services. A component’s constructor parameters tell Angular about the services that a component requires. So, a dependency injection offers a way to supply fully-formed dependencies required by a new instance of a class.
4. **Directives –** The templates used by Angular are dynamic in nature. Directives are responsible for instructing Angular about how to transform the DOM when rendering a template. Actually, components are directives with a template. Other [types of directives](https://angular.io/guide/attribute-directives) are attribute and structural directives.
5. **Metadata –** In order to let Angular know how to process a class, metadata is attached to the class. For doing so decorators are used.
6. **Modules –** Also known as NgModules, a module is an organized block of code with a specific set of capabilities. It has a specific application domain or a workflow. Like components, any Angular application has at least one module. This is known as the root module. Typically, an Angular application has several modules.
7. **Routing –** An Angular router is responsible for interpreting a browser URL as an instruction to navigate to a client-generated view. The router is bound to links on a page to tell Angular to navigate the application view when a user clicks on it.
8. **Services –** A very broad category, a service can be anything ranging from a value and function to a feature that is required by an Angular app. Technically, a service is a class with a well-defined purpose.
9. **Template –** Each component’s view is associated with its companion template. A template in Angular is a form of HTML tags that lets Angular know that how it is meant to render the component.

**Question: Can you give us an overview of Angular architecture?**  
**Answer**: You can draw some like this:



Here is Angular Architecture in detail: https://angular.io/guide/architecture

**Question**: **What is Angular Material?**  
**Answer**: It is a UI component library. [Angular Material](https://material.angular.io/) helps in creating attractive, consistent, and fully functional web pages as well as web applications. It does so while following modern web design principles, including browser portability and graceful degradation.

**Question**: **What is AOT (Ahead-Of-Time) Compilation?**  
**Answer**: Each Angular app gets compiled internally. The Angular compiler takes in the JS code, compiles it and then produces some JS code. This happens only once per occasion per user. It is known as AOT (Ahead-Of-Time) compilation.

**Question**: **What is Data Binding? How many ways it can be done?**  
**Answer**: In order to connect application data with the DOM (Data Object Model), data binding is used. It happens between the template (HTML) and component (TypeScript). There are 3 ways to achieve data binding:

1. Event Binding – Enables the application to respond to user input in the target environment
2. Property Binding – Enables interpolation of values computed from application data into the HTML
3. Two-way Binding – Changes made in the application state gets automatically reflected in the view and vice-versa. The ngModel directive is used for achieving this type of data binding.

**Question**: **What is demonstrated by the arrow in the following image?**

  
**Answer**: This represents a dependency injection or DI.

**Question**: **What is new in Angular 6?**  
**Answer**: Here are some of the new aspects introduced in Angular 6:

* Angular Elements – It allows converting Angular components into web components and embeds the same in some non-Angular application
* Tree Shakeable Provider – Angular 6 introduces a new way of registering a provider directly inside the @Injectable() decorator. It is achieved by using the providedIn attribute
* RxJS 6 – Angular 6 makes use of RxJS 6 internally
* i18n (internationalization) – Without having to build the application once per locale, any Angular application can have “runtime i18n”

**Question**: **What is ngOnInit ()? How to define it?**  
**Answer**: ngOnInit () is a lifecycle hook that is called after Angular has finished initializing all data-bound properties of a directive. It is defined as:

Interface OnInit {

          ngOnInit () : void

     }

**Question**: **What is SPA** **(Single Page Application) in Angular? Contrast SPA technology with traditional web technology?**  
**Answer**: In the SPA technology, only a single page, which is index.HTML, is maintained although the URL keeps on changing. Unlike the traditional web technology, SPA technology is faster and easy to develop as well.

In the conventional web technology, as soon as a client requests a webpage, the server sends the resource. However, when again the client requests for another page, the server responds again with sending the requested resource. The problem with this technology is that it requires a lot of time.

**Question**: **What is the code for creating a decorator?**  
**Answer**: We create a decorator called Dummy:

    function Dummy(target) {

       dummy.log('This decorator is Dummy', target);

    }

**Question**: **What is the process called by which TypeScript code is converted into JavaScript code?**  
**Answer**: It is called Transpiling. Even though TypeScript is used for writing code in Angular applications, it gets internally transpiled into equivalent JavaScript.

**Question**: **What is ViewEncapsulation and how many ways are there do to do it in Angular?**  
**Answer**: To put simply, ViewEncapsulation determines whether the styles defined in a particular component will affect the entire application or not. Angular supports 3 types of ViewEncapsulation:

* Emulated – Styles used in other HTML spread to the component
* Native – Styles used in other HTML doesn’t spread to the component
* None – Styles defined in a component are visible to all components of the application

**Question**: **Why prioritize TypeScript over JavaScript in Angular?**  
**Answer**: TypeScript is developed by Microsoft and it is a superset of JavaScript. The issue with JS is that it isn’t a true OOP language. As the JS code doesn’t follow the Prototype Pattern, the bigger the size of the code the messier it gets. Hence, it leads to difficulties in maintainability as well as reusability. To offset this, TypeScript follows a strict OOP approach.