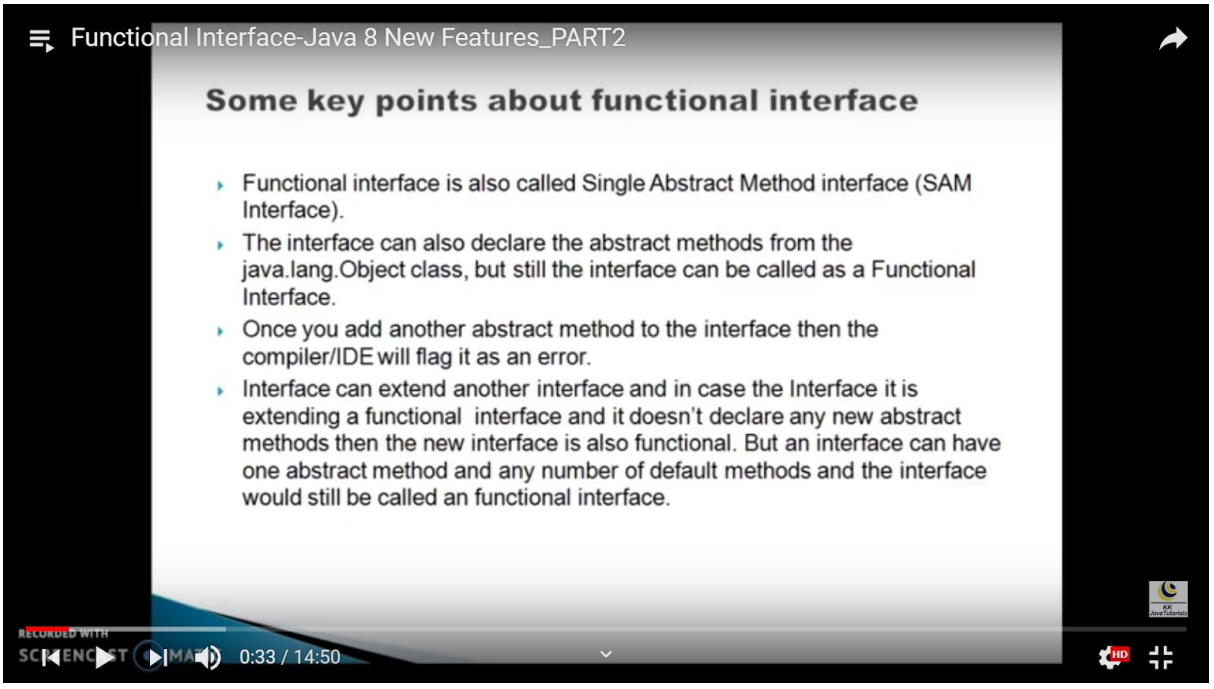
Functional Interface :



1. What is functional interface

Functional interfaces are new additions in java 8 which permit exactly one abstract method inside them. These interfaces are also called Single Abstract Method interfaces (SAM Interfaces).

In Java 8, functional interfaces can be represented using lambda expressions, method reference and constructor references as well.

Java 8 introduces an annotation i.e. @FunctionalInterface too, which can be used for compiler level errors when the interface you have annotated violates the contracts of exactly one abstract method.

Let's build our first functional interface:

```
@FunctionalInterface
public interface MyFirstFunctionalInterface
{
    public void firstWork();
}
```

Let's try to add another abstract method:

```
@FunctionalInterface
public interface MyFirstFunctionalInterface
{
    public void firstWork();
    public void doSomeMoreWork();   //error
}
```

2. Do's and Don't's in functional interfaces

Below is list of things which are allowed and which are not in a functional interface.

- As discussed above, *only one abstract method is allowed* in any functional interface. Second abstract method is not not permitted in a functional interface. If we remove @FunctionInterface annotation then we are allowed to add another abstract method, but it will make the interface non-functional interface.
- A functional interface is *valid even if the* `@FunctionalInterface` *annotation would be omitted*. It is only for informing the compiler to enforce single abstract method inside interface.
- Conceptually, a functional interface has exactly one abstract method. Since default methods have an implementation, they are not abstract. Since default methods are not abstract you're *free to add default methods to your functional interface as many as you like*.

Below is valid functional interface:

```
@FunctionalInterface
public interface MyFirstFunctionalInterface
{
    public void firstWork();

    default void doSomeMoreWork1(){
    //Method body
    }

    default void doSomeMoreWork2(){
    //Method body
    }
}
```

If an interface declares an *abstract method overriding one of the public methods of `java.lang.Object`, that also does not count toward the interface's abstract method count* since any implementation of the interface will have an implementation from java.lang.Object or elsewhere. e.g. Comparator is a functional interface even though it declared two abstract methods. Why? Because one of these abstract methods "`equals()`" which has signature equal to `public` method in `Object` class.

e.g. Below interface is a valid functional interface.

```
@FunctionalInterface
public interface MyFirstFunctionalInterface
{
    public void firstWork();

    @Override
    public String toString();                  //Overridden from Object
class

    @Override
    public boolean equals(Object obj);         //Overridden from Object
class
}
```