Object Oriented Programming with Java (Subject Code: BCS-403)

Unit 2

Lecture 15

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- Throw and throws in Exception Handling

throw keyword

- The Java throw keyword is used to throw an exception explicitly.
- We specify the **exception** object which is to be thrown. The Exception has some message with it that provides the error description. These exceptions may be related to user inputs, server, etc.
- We can throw either checked or unchecked exceptions in Java by throw keyword. It is mainly used to throw a custom exception.

- We can also define our own set of conditions and throw an exception explicitly using throw keyword.
- For example, we can throw ArithmeticException if we divide a number by another number.
- Here, we just need to set the condition and throw exception using throw keyword.

syntax of the Java throw keyword

```
public class Main {
    public static void main(String[] args) {
        int dividend = 10;
        int divisor = 0;

        if (divisor == 0) {
            throw new ArithmeticException("Cannot divide by zero");
        }

        int result = dividend / divisor;
        System.out.println("Result: " + result);
    }
}
```

syntax of the Java throw keyword

throw new exception_class("error message");

Example of throw IOException.

throw new IOException("sorry device error");

Throwing Unchecked Exception

```
public class TestThrow1 {
   public static void validate(int age) {
      if(age<18) {
         //throw Arithmetic exception if not eligible to vote
    throw new ArithmeticException("Person is not eligible to vote");

      }
      else {
         System.out.println("Person is eligible to vote!!");
      }
   }
```

```
 public static void main(String args[]){
      //calling the function
      validate(13);
      System.out.println("rest of the code...");
  }
}
```

Note: If we throw unchecked exception from a method, it is must to handle the exception or declare in throws clause.

Java throws keyword

- The **Java throws keyword** is used to declare an exception. It gives an information to the programmer that there may occur an exception so it is better for the programmer to provide the exception handling code so that normal flow can be maintained.
- Exception Handling is mainly used to handle the checked exceptions. If there occurs any unchecked exception such as NullPointerException, it is programmers fault that he is not performing check up before the code being used.

- In a program, if there is a chance of raising an exception then the compiler always warns us about it and compulsorily we should handle that checked exception, Otherwise, we will get compile time error saying unreported exception xyz must be caught or declared to be thrown.
- To prevent this compile time error we can handle the exception in two ways:

➢ By using try catch

➢ By using the throws keyword

Syntax of java throws

return_type method_name() **throws** exception_class_name

{

//method code

}

Rule: If you are calling a method that declares an exception, you must either caught or declare the exception.

There are two cases:

- **Case1:**You caught the exception i.e. handle the exception using try/catch.
- **Case2:**You declare the exception i.e. specifying throws with the method.

```
// Java program to illustrate error in case
// of unhandled exception
class MyMain {
    public static void main(String[] args)
    {
        Thread.sleep(10000);
        System.out.println("Hello Geeks");
    }
}
```

Output

```
error: unreported exception InterruptedException; must be caught or declared to be
thrown
```

```
// Java program to illustrate throws
class  {
    public static void main(String[] args)
        throws InterruptedException
    {
        Thread.sleep(10000);
        System.out.println("Hello Geeks");
    }
}
```

Important Points to Remember about throws Keyword

- throws keyword is required only for checked exceptions and usage of the throws keyword for unchecked exceptions is meaningless.
- throws keyword is required only to convince the compiler and usage of the throws keyword does not prevent abnormal termination of the program.
- With the help of the throws keyword, we can provide information to the caller of the method about the exception.

Difference Between throw and throws

throw	throws
The throw keyword is used inside a function. It is used when it is required to throw an Exception logically.	The throws keyword is used in the function signature. It is used when the function has some statements that can lead to exceptions.
The throw keyword is used to throw an exception explicitly. It can throw only one exception at a time.	The throws keyword can be used to declare multiple exceptions, separated by a comma. Whichever exception occurs, if matched with the declared ones, is thrown automatically then.
throw keyword cannot propagate checked exceptions. It is only used to propagate the unchecked Exceptions that are not checked using the throws keyword.	throws keyword is used to propagate the checked Exceptions only.