



Enumeration and Exception

Rawlabs Academy

What is **Enumeration**?

An **Enums** or **Enumerations** is a special "*class*" that represents a group of constants (unchangeable variables, like **final** variables).

Final variables

```
public class Level {  
    public static final String LOW = "LOW";  
    public static final String MEDIUM = "MEDIUM";  
    public static final String HIGH = "HIGH";  
}
```

Enum

```
public enum Level {  
    LOW,  
    MEDIUM,  
    HIGH;  
}
```

Why use Java **Enums**?

Enum was introduced to **replace the use of int constant**.

```
public class Size {  
    public static final int SMALL = 1;  
    public static final int MEDIUM = 2;  
    public static final int LARGE = 3;  
    public static final int EXTRA_LARGE = 4;  
}
```

Can be simplify using enums.

```
public enum Size {  
    SMALL, MEDIUM, LARGE, EXTRA_LARGE;  
}
```

Java Enum - Basic Usage

```
public enum PizzaSize {  
    SMALL, MEDIUM, LARGE, EXTRA_LARGE;  
}  
  
public class Main {  
    public static void main(String[] args) {  
        System.out.println(PizzaSize.MEDIUM);  
        System.out.println(PizzaSize.LARGE);  
    }  
}
```

Java Enum in Switch Statement

```
public static void main(String[] args) {  
    PizzaSize myPizza = PizzaSize.LARGE;  
    switch(myPizza) {  
        case PizzaSize.SMALL:  
            System.out.println("I bought small pizza");  
            break;  
        case PizzaSize.MEDIUM:  
            System.out.println("I bought medium pizza");  
            break;  
        case PizzaSize.LARGE:  
            System.out.println("I bought large pizza");  
            break;  
    }  
}
```

Methods of Java Enum

- `ordinal()` : returns the position of an enum constant
- `compareTo()` : compare the enum constants based on their ordinal value
- `toString()` : returns string representation
- `name()` : returns defined name in a string form
- `valueOf()` : takes a string and return an enum constant having the same string name
- `values()` : return an array of enum type containing all the enum constants

Enum with **Predefined Value**

```
public enum Color {  
    RED("#F44336"),  
    GREEN("#43A047"),  
    BLUE("#0277BD");  
  
    private final String hex;  
  
    private Color(String hex) {  
        this.hex = hex;  
    }  
  
    public String getHex() {  
        return this.hex;  
    }  
}
```


Exception



What is **Exceptions**?

Exception is an abnormal condition.

In Java, an exception is an event that **disrupts** the normal flow of the program. It is object which is **thrown at runtime**.

Exception Handling

Exception Handling is a mechanism to handle runtime errors such as `ClassNotFoundException`, `IOException`, `SQLException`, `RemoteException`, etc.

Advantage : Maintain the normal flow of the application.

Exception Hierarchy

The `java.lang.Throwable` class is the root class of Java Exception hierarchy inherited by two subclasses: Exception and Error



Types of Exception



Checked Exception

- The classes that directly inherit the Throwable class except RuntimeException and Error are known as checked exceptions.
- Checked exceptions are **checked** at compile-time.

Example:

- `IOException`
- `SQLException`
- etc.

Unchecked Exception

- The classes that inherit the RuntimeException are known as unchecked exceptions.
- Unchecked exceptions are **not checked** at compile-time, but they are checked at runtime.

Example:

- `ArithmeticException`
- `NullPointerException`
- `ArrayIndexOutOfBoundsException`
- etc.

Error

Error is **irrecoverable**.

Example:

- `OutOfMemoryError`
- `VirtualMachineError`
- `AssertionError`
- etc.

Keywords

| Keyword | Description |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>try</code> | Specify a block where we should place an exception code |
| <code>catch</code> | Handle the exception. It must be preceded by try block which means we can't use catch block alone |
| <code>finally</code> | Execute the necessary code of the program. It is executed whether an exception is handled or not |
| <code>throw</code> | Throw an exception |
| <code>throws</code> | Declare exceptions, it specifies that there may occur an exception in the method. It doesn't throw an exception. It is always used with method signature. |

Exception Handling Example

```
public static void main(String[] args) {  
    int value = 0;  
    try {  
        System.out.println("This code should be throw an ArithmeticException");  
        value = 100/0;  
    } catch (ArithmeticException e) {  
        System.out.println(e);  
    }  
  
    System.out.println("Code ended by ArithmeticException");  
    System.out.println("Value still :: " + value);  
}
```

Custom Exception

```
public class MyCustomException extends Exception {  
    public MyCustomException(String message) {  
        super(message);  
    }  
}
```

Cont...

```
public static void main(String[] args) {  
    try {  
        System.out.println("I will be throw a new MyCustomException");  
        throw new MyCustomException("Hello world!!!");  
        System.out.println("This code not executed.");  
    } catch (MyCustomException e) {  
        System.out.println("Exception message is :: ", e.getMessage());  
    } finally {  
        System.out.println("Finally block, will be execute in the end process");  
    }  
}
```

Task

Create a method to check **Boba drink** payment if the payment is less than the price then throw a custom exception. And make validation if the selected **Boba menu** does not match the enum, then throw a custom exception with a message.

Note: Take advantage of user input

```
Input Boba menu : Boba Tea  
Input Size : REGULAR  
Input payment : 120000
```

```
Exception in thread "main" InvalidAmountException: Your amount is less than price!
```

```
Input Boba menu : Boba Tea  
Input Size: EXTRA_LARGE
```

```
Exception in thread "main" InvalidBobaSizeException: Invalid boba size!  
Available boba size: [REGULAR, LARGE]
```