链滴

Java 探索 Enum 实现

动手写一个Enum类

```java
package com.guihuo.api.java.lang;

public enum MyEnum {
    A,
    B;
}
```

查看字节码

在命令行中执行以下命令

```
javap MyEnum.class
```

得到以下代码

```java
public final class com.guihuo.api.java.lang.MyEnum extends java.lang.Enum<com.guihuo.api.java.lang.MyEnum> {
  public static final com.guihuo.api.java.lang.MyEnum A;
  public static final com.guihuo.api.java.lang.MyEnum B;
  public static com.guihuo.api.java.lang.MyEnum[] values();
  public static com.guihuo.api.java.lang.MyEnum valueOf(java.lang.String);
  static {};
}
```

一些收获

● enum最终还是会编译成class,同时继承Enum。
● 枚举中的每一项都会转成枚举类下的静态常量。

- 通过查看完整字节码，可以发现values 调用的是 常量池中$VALUES的clone()方法。

- 通过查看完整字节码，可以发现valueOf 调用的是 Enum下的valueOf方法。

查看完整字节码

在命令行中执行以下命令 查看Java编译器生成完整字节码

javap -verbose MyEnum.class

得到以下代码

```
Classfile /C:/Users/guihuo/Desktop/MyEnum.class
  Last modified 2018-12-6; size 988 bytes
  MD5 checksum 63cd6f3e2f55e64ba5028a8874b4b405
  Compiled from "MyEnum.java"
public final class com.guihuo.api.java.lang.MyEnum extends java.lang.Enum<com.guihuo.api.java.lang.MyEnum>
  minor version: 0
  major version: 52
  flags: ACC_PUBLIC, ACC_FINAL, ACC_SUPER, ACC_ENUM
Constant pool:
   #1 = Fieldref           #4.#36        // com/guihuo/api/java/lang/MyEnum.$VALUES:[Lcom/guihuo/api/java/lang/MyEnum;
   #2 = Methodref          #37.#38       // "[Lcom/guihuo/api/java/lang/MyEnum;".clone:()Ljava/lang/Object;
   #3 = Class              #17           // "[Lcom/guihuo/api/java/lang/MyEnum;"
   #4 = Class              #39           // com/guihuo/api/java/lang/MyEnum
   #5 = Methodref          #12.#40       // java/lang/Enum.valueOf:(Ljava/lang/Class;Ljava/lang/String;)Ljava/lang/Enum;
   #6 = Methodref          #12.#41       // java/lang/Enum."<init>":(Ljava/lang/String;I)V
   #7 = String             #13           // A
   #8 = Methodref          #4.#41        // com/guihuo/api/java/lang/MyEnum."<init>":(Ljava/lang/String;I)V
   #9 = Fieldref           #4.#42        // com/guihuo/api/java/lang/MyEnum.A:Lcom/guihuo/api/java/lang/MyEnum;
  #10 = String             #15           // B
  #11 = Fieldref           #4.#43        // com/guihuo/api/java/lang/MyEnum.B:Lcom/guihuo/api/java/lang/MyEnum;
  #12 = Class              #44           // java/lang/Enum
  #13 = Utf8               A
  #14 = Utf8               Lcom/guihuo/api/java/lang/MyEnum;
  #15 = Utf8               B
  #16 = Utf8               $VALUES
  #17 = Utf8               [Lcom/guihuo/api/java/lang/MyEnum;
  #18 = Utf8               values
  #19 = Utf8               ()[Lcom/guihuo/api/java/lang/MyEnum;
  #20 = Utf8               Code
  #21 = Utf8               LineNumberTable
  #22 = Utf8               valueOf
  #23 = Utf8               (Ljava/lang/String;)Lcom/guihuo/api/java/lang/MyEnum;
  #24 = Utf8               LocalVariableTable
  #25 = Utf8               name
  #26 = Utf8               Ljava/lang/String;
```

```
  #27 = Utf8               <init>
  #28 = Utf8               (Ljava/lang/String;I)V
  #29 = Utf8               this
  #30 = Utf8               Signature
  #31 = Utf8               ()V
  #32 = Utf8               <clinit>
  #33 = Utf8               Ljava/lang/Enum<Lcom/guihuo/api/java/lang/MyEnum;>;
  #34 = Utf8               SourceFile
  #35 = Utf8               MyEnum.java
  #36 = NameAndType        #16:#17        // $VALUES:[Lcom/guihuo/api/java/lang/MyEnum;
  #37 = Class              #17            // "[Lcom/guihuo/api/java/lang/MyEnum;"
  #38 = NameAndType        #45:#46        // clone:()Ljava/lang/Object;
  #39 = Utf8               com/guihuo/api/java/lang/MyEnum
  #40 = NameAndType        #22:#47        // valueOf:(Ljava/lang/Class;Ljava/lang/String;)Ljava/lang/Enum;
  #41 = NameAndType        #27:#28        // "<init>":(Ljava/lang/String;I)V
  #42 = NameAndType        #13:#14        // A:Lcom/guihuo/api/java/lang/MyEnum;
  #43 = NameAndType        #15:#14        // B:Lcom/guihuo/api/java/lang/MyEnum;
  #44 = Utf8               java/lang/Enum
  #45 = Utf8               clone
  #46 = Utf8               ()Ljava/lang/Object;
  #47 = Utf8               (Ljava/lang/Class;Ljava/lang/String;)Ljava/lang/Enum;
{
  public static final com.guihuo.api.java.lang.MyEnum A;
    descriptor: Lcom/guihuo/api/java/lang/MyEnum;
    flags: ACC_PUBLIC, ACC_STATIC, ACC_FINAL, ACC_ENUM

  public static final com.guihuo.api.java.lang.MyEnum B;
    descriptor: Lcom/guihuo/api/java/lang/MyEnum;
    flags: ACC_PUBLIC, ACC_STATIC, ACC_FINAL, ACC_ENUM

  public static com.guihuo.api.java.lang.MyEnum[] values();
    descriptor: ()[Lcom/guihuo/api/java/lang/MyEnum;
    flags: ACC_PUBLIC, ACC_STATIC
    Code:
      stack=1, locals=0, args_size=0
         0: getstatic     #1             // Field $VALUES:[Lcom/guihuo/api/java/lang/MyEnum;
         3: invokevirtual #2             // Method "[Lcom/guihuo/api/java/lang/MyEnum;".clone:(Ljava/lang/Object;
         6: checkcast     #3             // class "[Lcom/guihuo/api/java/lang/MyEnum;"
         9: areturn
      LineNumberTable:
        line 12: 0

  public static com.guihuo.api.java.lang.MyEnum valueOf(java.lang.String);
    descriptor: (Ljava/lang/String;)Lcom/guihuo/api/java/lang/MyEnum;
    flags: ACC_PUBLIC, ACC_STATIC
    Code:
      stack=2, locals=1, args_size=1
         0: ldc           #4             // class com/guihuo/api/java/lang/MyEnum
         2: aload_0
         3: invokestatic  #5             // Method java/lang/Enum.valueOf:(Ljava/lang/Class;Ljava/lang/String;)Ljava/lang/Enum;
         6: checkcast     #4             // class com/guihuo/api/java/lang/MyEnum
```

```
          9: areturn
      LineNumberTable:
        line 12: 0
      LocalVariableTable:
        Start  Length  Slot  Name   Signature
          0      10     0    name   Ljava/lang/String;

  static {};
    descriptor: ()V
    flags: ACC_STATIC
    Code:
      stack=4, locals=0, args_size=0
         0: new          #4                 // class com/guihuo/api/java/lang/MyEnum
         3: dup
         4: ldc          #7                 // String A
         6: iconst_0
         7: invokespecial #8                 // Method "<init>":(Ljava/lang/String;I)V
        10: putstatic    #9                 // Field A:Lcom/guihuo/api/java/lang/MyEnum;
        13: new          #4                 // class com/guihuo/api/java/lang/MyEnum
        16: dup
        17: ldc          #10                // String B
        19: iconst_1
        20: invokespecial #8                 // Method "<init>":(Ljava/lang/String;I)V
        23: putstatic    #11                // Field B:Lcom/guihuo/api/java/lang/MyEnum;
        26: iconst_2
        27: anewarray    #4                 // class com/guihuo/api/java/lang/MyEnum
        30: dup
        31: iconst_0
        32: getstatic    #9                 // Field A:Lcom/guihuo/api/java/lang/MyEnum;
        35: aastore
        36: dup
        37: iconst_1
        38: getstatic    #11                // Field B:Lcom/guihuo/api/java/lang/MyEnum;
        41: aastore
        42: putstatic    #1                 // Field $VALUES:[Lcom/guihuo/api/java/lang/MyEnum;
        45: return
      LineNumberTable:
        line 13: 0
        line 12: 26
}
Signature: #33                     // Ljava/lang/Enum<Lcom/guihuo/api/java/lang/MyEnum;>;
SourceFile: "MyEnum.java"
```