

-ER

Alternatives, Clients, MVC

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Lecture #5 out of 8

90 minutes

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Examples and Alternatives

-Client Suffix

What About Performance?

Model-View-Controller (MVC)

Rultor + Takes

Read and Watch



“When you need a manager, it’s often a sign that the managed are just plain old data structures and that the manager is the smart procedure doing the real work”

— Carlo Pescio

Your Coding Conventions Are Hurting You, 2011

Chapter #1:

Examples and Alternatives

[[Parser](#) Reader Controller Validator Encoder]

Parser

```

1 class Parser {
2     static int parseInt(String t) {
3         // Parse String into Integer
4     }
5     static float parseFloat(String t) {
6         // Parse String into Float
7     }
8     // And many more methods...
9 }
10
11 int x = Parser.parseInt("42");

```

```

1 class StringAsInt implements Number {
2     private final String txt;
3     StringAsInt(String t) { this.txt = t; }
4     @Override int intValue() {
5         // Parse String into Integer
6         // and return the value
7     }
8 }
9
10 Number n = new StringAsInt("42");
11 int x = n.intValue();

```

Reader

```

1 class Reader {
2     static char readChar(InputStream i) {
3         // Read the next char from the
4         // stream and return it, or NULL
5         // if the stream is at the EOF
6     }
7 }
8
9 InputStream i = new FileInputStream(..);
10 char c = Reader.readChar(i);

```

```

1 class Chars
2     private final InputStream is;
3     Chars(InputStream i)
4         this.is = i;
5     char next()
6         // Read the next char from the
7         // stream and throw exception
8         // if !exists()
9     bool exists()
10        // Return TRUE if not EOF
11
12    InputStream i = new FileInputStream(..);
13    Chars chars = new Chars(i);
14    char c = chars.next();

```

Controller

```

1 class SimpleController {
2     @GET
3     @Path("/index")
4     HttpResponse index(HttpRequest e) {
5         // Build an index page and return
6     }
7     @POST
8     @Path("/update")
9     HttpResponse update(HttpRequest e) {
10        // Save new user information
11        // and return HTTP 303
12    }
13 }

```

```

1 class IndexPage implements HttpPage
2     HttpResponse process(HttpRequest e) {
3         // Build an index page and return
4     }
5 class UpdatePage implements HttpPage
6     HttpResponse process(HttpRequest e) {
7         // Save new user information
8         // and return HTTP 303
9     }
10
11 new AllPages(
12     new IndexPage(),
13     new UpdatePage()
14 );

```

[Parser Reader Controller [Validator](#) Encoder]

Validator

```

1 class Validator {
2     bool isValid(int age) {
3         return age >= 18;
4     }
5 }
6 int a = 23;
7 Validator v = new Validator();
8 if (!v.isValid(a)) {
9     throw new Exception(
10         "Age is not valid"
11     );
12 }

```

```

1 interface Age
2     int value();
3 class DefaultAge implements Age
4     private final int a;
5     DefaultAge(int a)
6         this.a = a;
7     @Override int value()
8         return this.a;
9 class ValidAge implements Age {
10     private final Age origin;
11     ValidAge(Age age)
12         this.origin = age;
13     @Override int value()
14         int v = this.origin.value();
15         if (v < 18)
16             throw new Exception("Age is not valid");
17         return v;
18 }
19 Age a = new ValidAge(new DefaultAge(23));

```


[Parser Reader Controller Validator [Encoder](#)]

Encoder

```

1 package java.net;
2
3 class URLEncoder {
4     static String encode(String s, String enc) {
5         // Encode the string "s" using
6         // the "enc" encoding and return
7         // the encoded string
8     }
9 }
10
11 String e = URLEncoder.encode("@foo");
12 e.equals("%40foo");

```

```

1 class Encoded implements String {
2     private final String origin;
3     private final String encoding;
4     Encoded(String s, String enc) {
5         this.origin = s;
6         this.enc = encoding;
7     }
8     @Override String value() {
9         // Encode the string "origin" using
10        // the "encoding" and return
11        // the encoded string
12    }
13 }
14
15 String e = new Encoded("@foo");
16 e.value().equals("%40foo");

```

The right snippet won't work in Java, since `String` is a final class, not an interface, unfortunately.

Chapter #2:

-Client Suffix

AWS Java Client

```
1 class AmazonS3Client {  
2     createBucket(String name);  
3     deleteBucket(String name);  
4     doesBucketExist(String name);  
5     getBucketAcl(String name)  
6     getBucketPolicy(String name);  
7     listBuckets();  
8     // 160+ more methods here  
9 }  
10 client = new AmazonS3Client("us-1");  
11 client.createBucket("foo");  
12 client.putObject("foo", "a.txt");  
13 client.writeObject("foo", "a.txt", "data");
```

```
1 region = new S3Region("us-1");  
2 bucket = region.createBucket("foo");  
3 object = bucket.putObject("a.txt");  
4 object.write("data");
```

The left snippet is: 1) procedural, 2) hard to test, 3) resembles a utility class, and 4) is hard to extend. The right one is object-oriented.

Chapter #3:

What About Performance?

Sticky Parseable Object

```
1 class StringAsInt implements Number {
2     private final String txt;
3     StringAsInt(String t) { this.txt = t; }
4     @Override int intValue() {
5         // Parse String into Integer
6         // and return the value
7     }
8 }
9
10 Number n = new StringAsInt("42");
11 int x = n.intValue();
```

```
1 class StickyInt implements Number {
2     private final Number origin;
3     private int cache = 0;
4     private bool cached = false;
5     StickyInt(Number n) { origin = n; }
6     @Override int intValue() {
7         if (!cached) {
8             cache = origin.intValue();
9             cached = true;
10        }
11        return cache;
12    }
13 }
```

Alternatives -Client Performance MVC Takes R-and-W
[Sticky Safe]

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Is it thread-safe though?

Thread-safe Sticky Parseable Object

```
1 class StickyInt implements Number {  
2     private final Number origin;  
3     private int cache = 0;  
4     private bool cached = false;  
5     StickyInt(Number n) { origin = n; }  
6     @Override int intValue() {  
7         if (!cached) {  
8             cache = origin.intValue();  
9         }  
10        return cache;  
11    }  
12 }
```

```
1 class StickyInt implements Number {  
2     private final Number origin;  
3     private final AtomicReference<Integer> cache =  
4         new AtomicReference<Integer>(null);  
5     StickyInt(Number n) { origin = n; }  
6     @Override int intValue() {  
7         return cache.updateAndGet(  
8             x -> {  
9                 if (x == null) {  
10                    return origin.intValue();  
11                }  
12                return x;  
13            }  
14        );  
15    }  
16 }
```

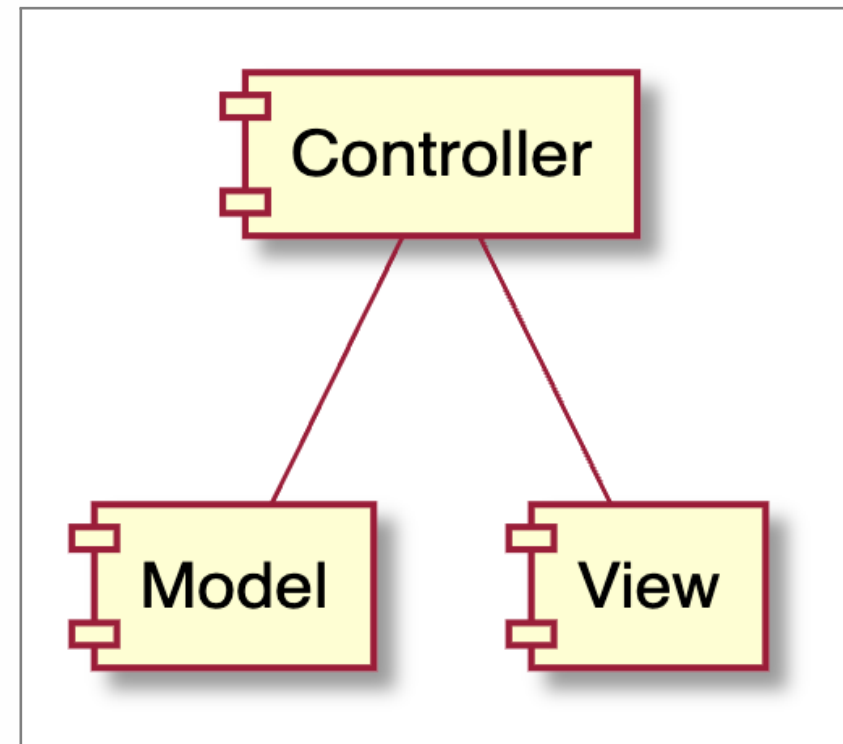
The left snippet is not thread-safety, while the right one is.

Chapter #4:

Model-View-Controller (MVC)

The Controller

```
1 class Controller {  
2     @GET  
3     @Path("/b{id}")  
4     String index(int id) {  
5         Book book = em.findById(id);  
6         View v = new HtmlView("book.html");  
7         v.set("title", book.getTitle());  
8         return v.renderHtml();  
9     }  
10 }
```



Book as HTML

```

1 class Controller {
2     @GET
3     @Path("/b{id}")
4     String index(int id) {
5         Book book = em.findById(id);
6         View v = new HtmlView("book.html");
7         v.set("title", book.getTitle());
8         return v.renderHtml();
9     }
10 }

```

```

1 interface Book
2     String title();
3 class PgBook implements Book
4     String title() // loads from PostgreSQL
5 interface Page
6     String html();
7 class HtmlBook implements Book, Page
8     String html() // renders in HTML
9     String title() // returns origin.title()
10 class PageOnPath implements Page
11     private final String path;
12     private final Page origin;
13     String html() // renders if path matches

```

Check [yegor256/jpages](#) and [yegor256/takes](#).



rultor.com



takes.org

Chapter #5:

Rultor + Takes

Chapter #6:

Read and Watch

Don't Create Objects That End With -ER by me (2015)

MVC vs. OOP by me (2016)

Yet Another Evil Suffix For Object Names: Client by me (2017)