

Implementing Test Coverage in Epsilon

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Introduction - Model Driven Engineering

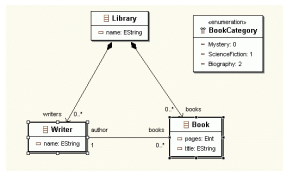


Figure : A sample model [Eclipse, 2014]

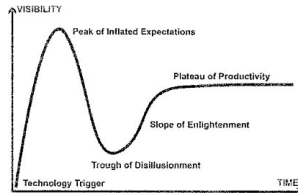


Figure : The technology hype cycle [M. Brambilla, 2012]

Introduction - Model Driven Engineering



Introduction - Software Testing Metrics

```
public Object executeAST(AST ast, IEolContext context) throws EolRuntimeException{  
    if (ast == null) return null;  
    activeAst = ast;  
  
    if (executionController != null){  
        if (executionController.isTerminated()) throw new EolTerminationException(ast);  
        try {  
            executionController.control(ast, context);  
        }  
        catch (Exception ex) { throw new EolInternalException(ex); }  
    }  
}
```

Figure : EclEmma [EclEmma.org, 2014]

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```
if ((err = ReadyHash(&SSLHashSHA1, &hashCtx)) != 0)
    goto fail;
if ((err = SSLHashSHA1.update(&hashCtx, &clientRandom)) != 0)
    goto fail;
if ((err = SSLHashSHA1.update(&hashCtx, &serverRandom)) != 0)
    goto fail;
if ((err = SSLHashSHA1.update(&hashCtx, &signedParams)) != 0)
    goto fail;
goto fail;
if ((err = SSLHashSHA1.final(&hashCtx, &hashOut)) != 0)
    goto fail;
```

Figure : Apple's SSL Bug [Imperial Violet, 2014]

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```
1 if (true) {  
2     "Hello".println();  
3 }  
4  
5 "Hello".println();
```

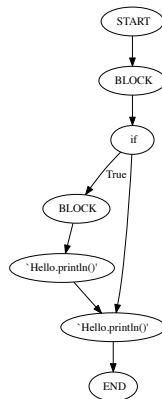
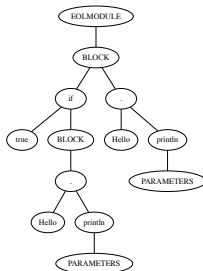


Figure : From left to right: Code for an if statement, its AST and its CFG

Implementing Statement Coverage

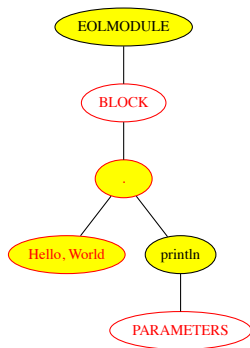


Figure : The executed AST for the Hello, World program

Implementing Statement Coverage

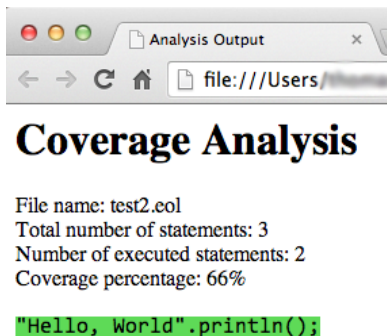


Figure : The HTML output from test ST-01, shown in Google Chrome

Implementing Statement Coverage



Figure : The fixed HTML output from test ST-01, shown in Google Chrome