Action
Plan
Report

Application: MapCore
Analysis label: Project Part 3 Deliverable
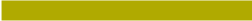**Analysis date:** 2016/04/06 01:14
Report date: 2016/04/06 13:18

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OVERVIEW

This action plan is the result of a What If exercise calculated in order to get better in quality spending the less as possible. In this section Kiuwan provides the main numbers as they are now and as they are going to be if all suggested correction wil be done.

Effort to spend

33.75 Hours

	As is	To be
Risk index	97.04	0.00
Global indicator	41.58	83.74
Effort to target	34 h	0 h

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INDICATOR VALUES
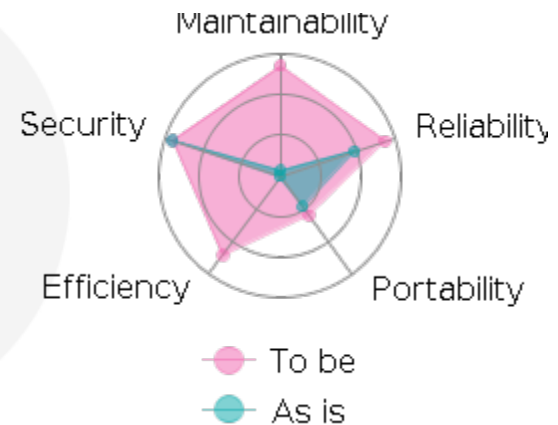
You have the model indicators in the current analysis and the ones that you are going to get if you executes this Action Plan.

Global indicator

83.74

	As is	To be
Maintainability	4.59	90.72
Reliability	64.43	91.06
Portability	31.25	40.48
Efficiency	0.56	80.44
Security	93.71	93.71
Global indicator	41.58	83.74

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EFFORT TO SPEND

In this chapter you have a detailed budget of this action plan.
You get a breakdown according to the software characteristics
defined in CQM model.

Effort to spend

33.75 Hours

Effort to spend	
Efficiency	7.1 Hours
Maintainability	22.85 Hours
Portability	1.7 Hours
Reliability	2.1 Hours
Security	0 Hours
Total	33.75 Hours

- Efficiency
- Maintainability
- Portability
- Reliability
- Security

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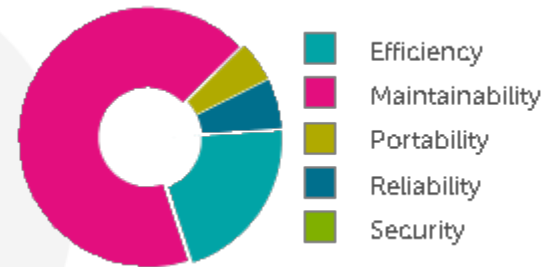
DETAILED ACTION PLAN

This chapter contains the technical information of the Action Plan. You have a different section for each broken rule.

About each rule you have tha number of defects that you have to correct and the number of files that you need to change. In addition you get the softare characteristic, the language, the priority (importance) and the difficulty (represents the time you need to apply the change).

Then you can read (in bold) each file that contains defects, and at the end the line number and the text line where you can find the defect.

2 Defect(s) 2 File(s)	Use getClass() in the equals() method implementation.	Efficiency java	Priority 2 Effort 6m

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/Location.java
> 87   public boolean equals(Object object) {

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/TrafficData.java
> 23   public boolean equals(Object object) {

10 Defect(s) 5 File(s)	Do not instantiate temporal Objects in loops bodies.	Efficiency java	Priority 2 Effort 6m

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/converter/Converter.java
> 49   Location from = new Location(latitude, longitude);
> 59   PrintWriter out = new PrintWriter(filename);
> 70   Location to = new Location(segmentNode.getKey());

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CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/Node.java

309   Scan scan = new Scan();

316   return new Node(actual_geohash, tags);

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/Segment.java

76   JsonParser jsonParser = new JsonParser();

94   Scan scan = new Scan();

102   Map<String, String> hmap = new HashMap<>();

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/simulator/Simulator.java

38   FileReader reader = new FileReader(file);

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/simulator/SimulatorDataModel.java

43   DateTime time = new DateTime(timestamp, DateTimeZone.UTC);

2 Defect(s) 1 File(s)	Avoid static collections; they can grow without bounds.	Efficiency java	Priority 2 Effort 6m

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/importer/Importer.java

34   private static final HashMap<Long, Node> nodes = new HashMap<>();

35   private static final ArrayList<Way> ways = new ArrayList<>();

30 Defect(s) 4 File(s)	Use specialized library instead of System.out or System.err for logging	Efficiency java	Priority 2 Effort 6m

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CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/Main.java

```
80    System.err.println("Run converter with the option --host point to the REST API");
86    System.err.println("Parsing failed.  Reason: " + exp.getMessage());
108   System.out.println("***** Heap utilization statistics [MB] *****");
```

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/importer/Importer.java

```
45    System.out.println("Starting...");
46    System.out.println(configuration.toString());
97    System.err.println("Parser Error, Turns out we needed our way object.");
130   System.out.println("Added Node Tag " + key + ": " + value + "for " + node.getOsmId());
134   System.out.println("Added Way Tag " + key + ": " + value + "for " + way.getId());
150   System.out.print("\rAdded Node " + String.valueOf(node.getOsmId()));
154   System.out.print("\rAdded Way " + String.valueOf(way.getId()) + "     ");
161   System.out.println("Number of nodes read: " + nodes.size());
162   System.out.println("Number of ways read: " + ways.size());
169   System.out.println("Finished!");
176   System.out.println("Importing nodes...");
179   System.err.println("Node table failed to load.");
194   System.out.print("\rBatch " + counter + " / " + nodes.size());
198   System.err.println("Node put failed");
207   System.out.println("Node put failed");
210   System.out.println("Added all nodes!");
219   System.out.println("Importing ways (segments)...");
222   System.err.println("Segment table failed to load.");
248   System.out.print("\rBatch " + counter + " / " + ways.size());
```

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252   System.out.println("Segment put failed");

260   System.out.println("Segment put failed");

263   System.out.println("Added all segments!");

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/simulator/Simulator.java

31   System.err.println("'data/simulator' folder not found in current working directory");

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/WebApi.java

31   System.err.println(raw_port + " is not a valid port integer.");

35   System.out.println("Initializing HBase tables");

40   System.err.println("One or more required tables does not exist!");

53   System.out.println("Server has started.");

1 Defect(s) 1 File(s)	Avoid parameter method names that provoke conflicts with class members names.	Maintainability java	Priority 2 Effort 3m

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/Node.java

280   public static Node getClosestNodeFromLocation(Location location, Table node_table) {

5 Defect(s) 5 File(s)	Cyclomatic complexity.	Maintainability java	Priority 1 Effort 4h

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/Main.java

14   public static void main(String[] args) {

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/converter/Converter.java

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32   public static void run(String csvFile, String host) {

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/TrafficData.java

23   public boolean equals(Object object) {

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/importer/Importer.java

44   public static void import_from_file(String filename) throws XMLStreamException {

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/handler/NodeHandler.java

33   public void handle(HttpExchange httpExchange) {

	Do not write IP address in source code.	Portability	Priority 2
1 Defect(s)		java	Effort 6m
1 File(s)			

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/Main.java

23   options.addOption("", "host", true, "Hostname for REST server (e.g.: 'http://199.116.235.225'");

	Avoid writing directly in the code directory separators in order to create a java.io.File file.	Portability	Priority 2
1 Defect(s)		java	Effort 6m
1 File(s)			

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/simulator/Simulator.java

25   File folder = new File("data/simulator");

	Do not use Runtime and System classes.	Portability	Priority 2
3 Defect(s)		java	Effort 30m
1 File(s)			

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CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/WebApi.java

- 31 System.err.println(raw_port + " is not a valid port integer.");
- 35 System.out.println("Initializing HBase tables");
- 40 System.err.println("One or more required tables does not exist!");

| 27 Defect(s) | Do not use the printStackTrace method. | Efficiency java | Priority 2 |
| 13 File(s) | | | Effort 6m |

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/Main.java

- 64 e.printStackTrace();
- 88 e.printStackTrace();

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/converter/Converter.java

- 102 e.printStackTrace();

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/Node.java

- 321 e.printStackTrace();
- 350 e.printStackTrace();

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/Segment.java

- 43 e.printStackTrace();
- 114 e.printStackTrace();

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/data/controller/
RestController.java

- 60 e.printStackTrace();
- 62 e.printStackTrace();

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```
64   e.printStackTrace();
66   e.printStackTrace();
81   e.printStackTrace();
83   e.printStackTrace();
97   e.printStackTrace();
99   e.printStackTrace();
```

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/importer/Importer.java
```
199   e.printStackTrace();
208   e.printStackTrace();
253   e.printStackTrace();
261   e.printStackTrace();
```

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/simulator/Simulator.java
```
56   e.printStackTrace();
68   e.printStackTrace();
```

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/util/Util.java
```
32   e.printStackTrace();
```

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/Helper.java
```
70   e.printStackTrace();
```

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/WebApi.java
```
55   e.printStackTrace();
```

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CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/handler/
NodeHandler.java

    77   e.printStackTrace();

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/handler/
SegmentHandler.java

    47   e.printStackTrace();

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/handler/
TrafficHandler.java

    42   e.printStackTrace();

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16 Defect(s)	Avoid local variables with similar names.	Maintainability java	Priority 3
5 File(s)			Effort 3m

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/importer/Importer.java

    66   for (int i = 0; i < xmlStreamReader.getAttributeCount(); i++) {
    67   String value = xmlStreamReader.getAttributeValue(i);
    68   String s = xmlStreamReader.getAttributeLocalName(i);
    87   for (int i = 0; i < xmlStreamReader.getAttributeCount(); i++) {
    88   String value = xmlStreamReader.getAttributeValue(i);
    89   String s = xmlStreamReader.getAttributeLocalName(i);
   102   for (int i = 0; i < xmlStreamReader.getAttributeCount(); i++) {
   103   String s = xmlStreamReader.getAttributeLocalName(i);
   105   String value = xmlStreamReader.getAttributeValue(i);
   118   String s = xmlStreamReader.getAttributeLocalName(i);

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CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/simulator/Simulator.java

    39   SimulatorDataModel data = gson.fromJson(reader, SimulatorDataModel.class);

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/simulator/
SimulatorDataModel.java

    44   int hour = time.getHourOfDay();

    46   SummaryStatistics stats;

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/handler/
NodeHandler.java

    42   Node node = Node.getNodeFromID(osmId, WebApi.get_node_table());

    52   Node node = Node.getClosestNodeFromGeohash(geohash, WebApi.get_node_table());

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/handler/
SegmentHandler.java

    30   String neighbors = Segment.getClosestSegmentFromGeohash(geohash,
        WebApi.get_segment_table());

1 Defect(s) 1 File(s)	Do not call System.exit().	Reliability java	Priority 1 Effort 6m

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/Main.java

    76   System.exit(r);

4 Defect(s) 4 File(s)	Provide Javadoc comments for public classes and interfaces.	Maintainability java	Priority 2 Effort 30m

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CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/Main.java

    11   public class Main {

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/simulator/Simulator.java

    13   public class Simulator {

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/util/Util.java

    13   public class Util {

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/handler/
TrafficHandler.java

    22   public class TrafficHandler implements HttpHandler {

---

4 Defect(s)			
2 File(s)	Initialize all static fields.	Reliability java	Priority 2 Effort 30m

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/Main.java

    12   private static Options options = null;

CMPUT402W16T1-master/MapCore/src/main/java/com/cmput402w2016/t1/webapi/WebApi.java

    20   private static Table node_table = null;
    21   private static Table segment_table = null;
    22   private static Table traffic_table = null;

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ABOUT OPTIMYTH

Optimyth is an independent software company specialized in solutions to support large companies with their rationalization, quality and productivity management initiatives whilst improving the overall maintainability of the software estate. Our solutions raise the quality and increase the performance of business systems. They improve the efficiency, cost control and productivity within an organization, thus achieving maximum IT value.

These solutions are based on our state of the art checKing products: an Integrated Application Quality Management Portal which aggregates information from all the stages of a development life cycle into one "single pane of glass". And, an Application Inventory Management system that allows companies to untangle the complexity of their application through automatic discovery of software components, and the relationships between them at different levels, enabling rationalization initiatives and impact analysis capabilities to reduce maintenance costs.

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