Section 1: Instruction for running program

This simulator has been set up using Java programming language. To run the simulator, run the class called 'Main.java' or just Main (if the extension has been hidden). This class can be found on the folder Assignment4 > src. Pass the file name including its extension on the command line, make sure that the file you are trying to run has been saved on the folder called 'Files' as the simulator has been set up to only run files in that folder.

The simulator has been set up to run a single cache configuration by default. To run the simulator with a different configuration, change the value of the variable 'configuration' which can be found at the top of the Main class. Change the value to 'multilevel' to run a multi-level cache or to 'singlelevel' to run a single cache.

After changing the configuration type, change the block size and/or the bytes per block to your desired values. To do this, change the value(s) of the following variables:

To change size of the L1 cache, change the values of these variables,

- `l1NumberOfBlocks`
- `l1BytesPerBlock`

To change size of the L2 cache, change the values of these variables,

- `l2NumberOfBlocks`
- `l2BytesPerBlock`

If the selected configuration is a single-cache, you do **NOT** have to change the values of the L2 cache, as it will have no effect on your results.

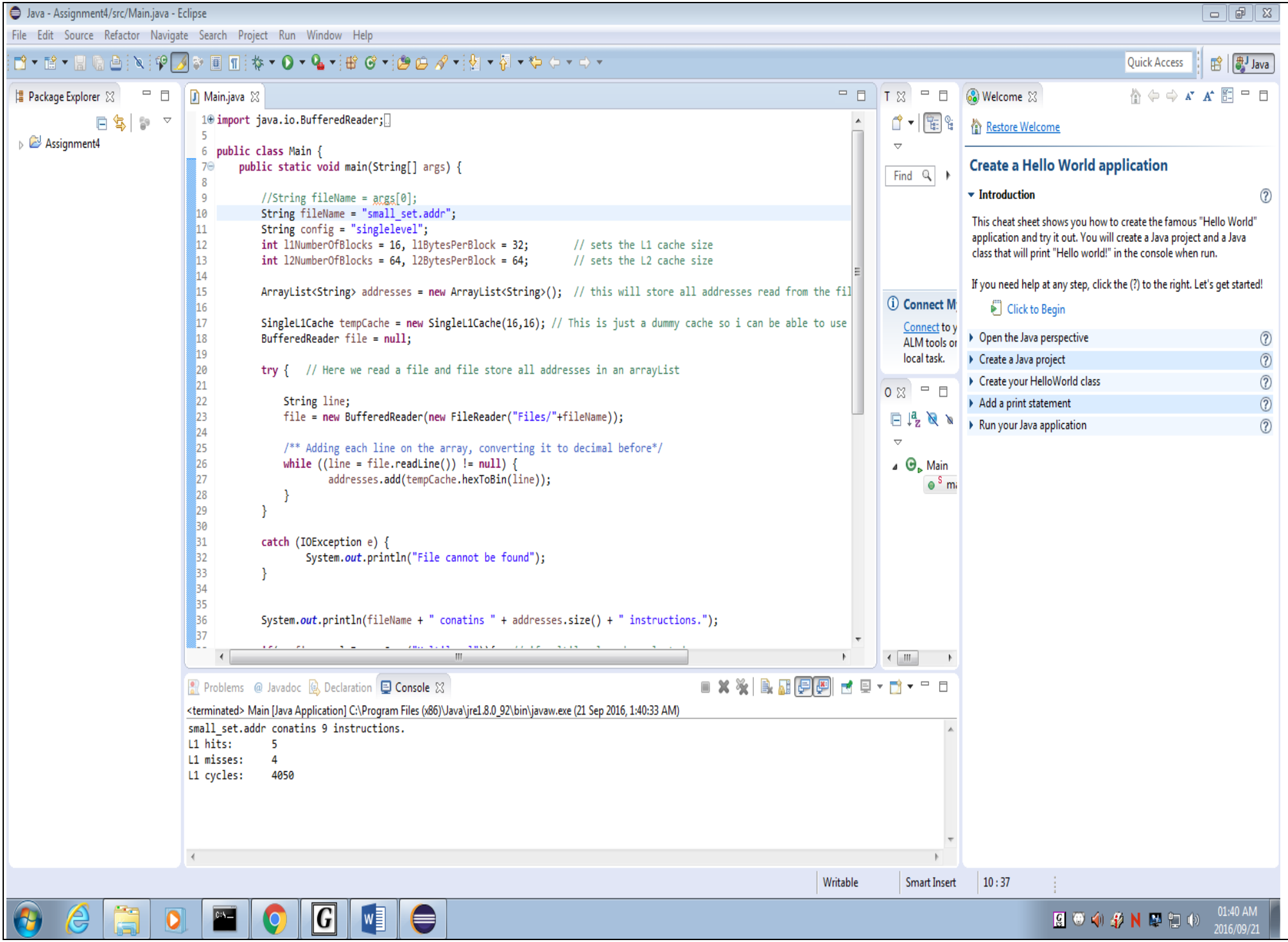
The comments of the code can be found inside the code.

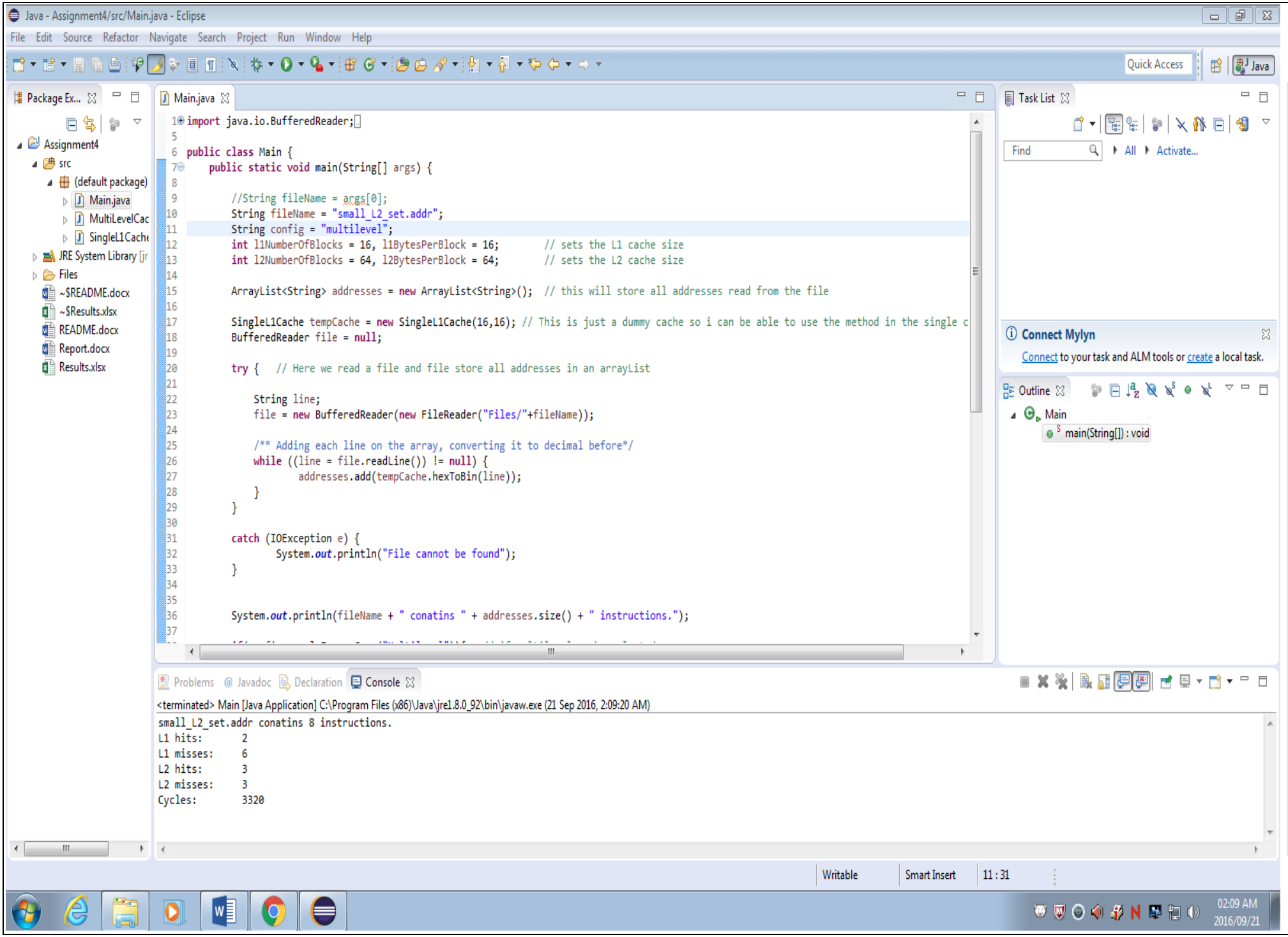
TO RUN ON AN IDE, FOLLOW THE FIRST TWO COMENTS ON THE MAIN CLASS.

Section 2: Proof of simulators functionality correctness

The simulator's functionality has been tested and proven to be working correctly, single level's cache configuration functionality was tested using the 'small_set.addr' file and the results produced were the same as those of the given example. Setting the size to 16 blocks and 32 bytes / block, the obtained results can be found on page 2, on the first attached screenshot.

The multi level's cache configuration functionality was tested using the 'small_L2_set.addr' file and the results produced were the same as those of the given example. Setting the size to L1 cache: 16 blocks and 16 bytes / block and L2 cache: 64 blocks and 64 bytes / block. The obtained results can be found on page 3, on the second attached screenshot.


Java - Assignment4/src/Main.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Quick Access
Java
Package Explorer
Assignment4
Main.java
1 import java.io.BufferedReader;
5
6 public class Main {
7 public static void main(String[] args) {
8
9 //String fileName = args[0];
10 String fileName = "small_set.addr";
11 String config = "singlelevel";
12 int l1NumberOfBlocks = 16, l1BytesPerBlock = 32; // sets the L1 cache size
13 int l2NumberOfBlocks = 64, l2BytesPerBlock = 64; // sets the L2 cache size
14
15 ArrayList<String> addresses = new ArrayList<String>(); // this will store all addresses read from the fil
16
17 SingleL1Cache tempCache = new SingleL1Cache(16,16); // This is just a dummy cache so i can be able to use
18 BufferedReader file = null;
19
20 try { // Here we read a file and file store all addresses in an arrayList
21
22 String line;
23 file = new BufferedReader(new FileReader("Files/"+fileName));
24
25 /** Adding each line on the array, converting it to decimal before*/
26 while ((line = file.readLine()) != null) {
27 addresses.add(tempCache.hexToBin(line));
28 }
29 }
30
31 catch (IOException e) {
32 System.out.println("File cannot be found");
33 }
34
35
36 System.out.println(fileName + " conatins " + addresses.size() + " instructions.");
37
Welcome
Restore Welcome
Create a Hello World application
Introduction
This cheat sheet shows you how to create the famous "Hello World" application and try it out. You will create a Java project and a Java class that will print "Hello world!" in the console when run.
If you need help at any step, click the (?) to the right. Let's get started!
Click to Begin
Open the Java perspective
Create a Java project
Create your HelloWorld class
Add a print statement
Run your Java application
Find
Connect M
Connect to y
ALM tools or
local task.
Main
Problems @ Javadoc Declaration Console
<terminated> Main [Java Application] C:\Program Files (x86)\Java\jre1.8.0_92\bin\javaw.exe (21 Sep 2016, 1:40:33 AM)
small_set.addr conatins 9 instructions.
L1 hits: 5
L1 misses: 4
L1 cycles: 4050
Writable
Smart Insert
10 : 37
01:40 AM
2016/09/21


Java - Assignment4/src/Main.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Quick Access
Java
Package Ex...
Assignment4
src
(default package)
Main.java
MultiLevelCac
SingleL1Cache
JRE System Library [jr
Files
~$README.docx
~$Results.xlsx
README.docx
Report.docx
Results.xlsx
Main.java
1 import java.io.BufferedReader;
5
6 public class Main {
7 public static void main(String[] args) {
8
9 //String fileName = args[0];
10 String fileName = "small_L2_set.addr";
11 String config = "multilevel";
12 int l1NumberOfBlocks = 16, l1BytesPerBlock = 16; // sets the L1 cache size
13 int l2NumberOfBlocks = 64, l2BytesPerBlock = 64; // sets the L2 cache size
14
15 ArrayList<String> addresses = new ArrayList<String>(); // this will store all addresses read from the file
16
17 SingleL1Cache tempCache = new SingleL1Cache(16,16); // This is just a dummy cache so i can be able to use the method in the single c
18 BufferedReader file = null;
19
20 try { // Here we read a file and file store all addresses in an arrayList
21
22 String line;
23 file = new BufferedReader(new FileReader("Files/"+fileName));
24
25 /** Adding each line on the array, converting it to decimal before*/
26 while ((line = file.readLine()) != null) {
27 addresses.add(tempCache.hexToBin(line));
28 }
29 }
30
31 catch (IOException e) {
32 System.out.println("File cannot be found");
33 }
34
35
36 System.out.println(fileName + " conatins " + addresses.size() + " instructions.");
37
Task List
Find
All
Activate...
Connect Mylyn
Connect to your task and ALM tools or create a local task.
Outline
Main
main(String[]) : void
Problems
Javadoc
Declaration
Console
<terminated> Main [Java Application] C:\Program Files (x86)\Java\jre1.8.0_92\bin\javaw.exe (21 Sep 2016, 2:09:20 AM)
small_L2_set.addr conatins 8 instructions.
L1 hits: 2
L1 misses: 6
L2 hits: 3
L2 misses: 3
Cycles: 3320
Writable
Smart Insert
11 : 31
02:09 AM
2016/09/21