# Solution Document Program design and development

# YOUR NAME e.g Jon Doe

# YOUR ID W2309230923

**Don’t forget to submit your java file(s) too. ( and just your java files ) .**

**If you need an extension for any reason please contact ASK4Help either in person in the library or via the web.**

|  |  |  |  |
| --- | --- | --- | --- |
| 3.1 | What is the URL for Oracle’s documentation for TreeMap in Java? | 2 Marks |  |
| 3.2 | In 200 words or less describe what a TreeMap does.  What interfaces does TreeMap implement?  What unique methods does the **NavigableMap?**  **Pick one method from the unique methods NavigableMap and explain what does.**  **What is your estimate for the O Notation for that method.** | 5 Marks |  |
| 4.1 | Based on **the last DIGIT** of your STUDENT ID name pick one of the following pairs   * + 2,6,0,     1. Look at ArrayList and LinkedList   + 3,7,1     1. Look at TreeMap and HashMap   + 4,8     1. Look at TreeSet and HashSet   + 9,5,     1. Look at HashMap and ArrayList   + IN A MINIMUM OF **400** YOUR OWN WORDS (each 800 total) – Pick a method from each class which is faster than the other. Say which method that is and explain why it is faster ( you might need to refer to how to the   + If you have problems writing use     1. Diagrams you can assume 1 diagram == 30 words.     2. One code example = 30 words   + For each data method write 100 words on what circumstances might be faster for which purposed.   + Going over 800 and 200 is permissible.   + IF YOU HAVE PROBLEMS GETTING STARTED GOT TO THE LIBRARY AND GET ONE OF THE ALGORITHUM BOOKS OUT.   + This section will be checked for plagiarism | 20 Mark |  |
|  | Paste your words here. |  |  |
| 4 | 1. Profile SimulationModelTest.java    * Set isProfiling = true    * Do a performance analysis of the performance test in Netbeans.    * This is your time to be a detective.      1. Ask yourself what is slowing this code down ?      2. Dig wide and deep. Use the profiler to look for clues. |  |  |
| 5.1 | PASTE YOU IMAGE HERE [ 5 MARKS ]  Note last year people didn’t paste in the after image in section in 8 .  paste in a screen dump of your performance analysis when running with SimulationModelTest.java | 5 Marks |  |
| 5.2 | In your solution document identify from the profiler which top 4 methods from the project code are the most time consuming? You’re looking for the methods which are most responsible for slowing the program down.   |  |  | | --- | --- | | **1** |  | | **2** |  | | **3** |  | | **4** |  | | 4 Marks |  |
| 5.3 | Now examine the code inside the project. Which methods should receive priority for your attention put down the name of the method and why you chose it. You don’t have to pick the slow methods. You might pick another method for some reason. For example, one method might speed up other method. Provided you have a good reason that’s fine   |  |  |  | | --- | --- | --- | |  | Target | Reason | | **1** |  |  | | **2** |  |  | | **3** |  |  | | **4** |  |  | | 4 Marks |  |
| 5.4 | For each of your targets, write what is your estimate of the o notation ( eg. O(n), O(n2) O(log(n)) etc ) time of this methods and/or any methods it calls. Start with the most inefficient and move to down to most efficient.   |  |  |  | | --- | --- | --- | |  | Target | O-notation for estimate of speed | | **1** |  |  | | **2** |  |  | | **3** |  |  | | **4** |  |  | | 10 Marks |  |
| 5.5 | What is the overall O-Notation N for this project ? | 4 Marks |  |
| 5.6 | What is the O-Notation for ( eg. O(n), O(n2) O(log(n)) etc ) time of this methods and/or any methods it calls.   |  |  |  | | --- | --- | --- | |  | Target | O-notation for estimate of speed | | **1** | **StudentSimulation. move( )** |  | | **2** | **StudentSimulation. generate ( )** |  | | **3** | **StudentSimulation. testforInfection( )** |  | | 5 Marks |  |
| 8 | Now Implement your speed increases.  What marks did your Unit test return ?[ 20 marks ]  This will be automatically checked. IF you don’t submit your code ( see below) the mark will be reduced to zero. | 20 Marks |  |
|  | Time so show off your brilliance.  What are the top 4 changes you made and why? This can be to data structures, changing classes of alterations to methods.  If you have lost the original code you modified look in BASECASE\_IGNORE\_INTERNAL.java ( starts off the same ).  NOTE IF YOU CAN’T GET THE CODE TO WORK/Compile ( it happens ) You can write in what changes you think you should make as explanations or peusdo code. |  |  |
| 9. | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Change | Original code | Changed code | Reason | Smaller | Mark | | Example | public List<Card> processCardsUsed( String p1cardsUsed , Deck dck )  {  List<Card> cds = new ArrayList<Card>();  p1cardsUsed = p1cardsUsed.replace("used,", "");  String cardsUsed[] = p1cardsUsed.split(",");    for( String s: cardsUsed )  { | public List<Card> processCardsUsed( String p1cardsUsed , Deck dck )  {  p1cardsUsed = p1cardsUsed.replace("used,", "");  String cardsUsed[] = p1cardsUsed.split(",");  List<Card> cds = new **ArrayList<Card>(cardsUsed.length);**    for( String s: cardsUsed )  { | Allocating ArrayList with known number of items will save time reallocating several times the array as it grows.  *Note this isn’t a good example. Won’t make a big change in code time.* | Was your code bigger smaller or the same size. | - change 0 | | 1. |  |  |  |  | [4] | | 2. |  |  |  |  | [4] | | 3. |  |  |  |  | [4] | | 4 |  |  |  |  | [4] | | 16 Marks |  |
| 10 | FINALY Run your program under the profiler – and screen grab the profiler again  PASTE YOU IMAGE HERE [ 5 MARKS ] | 5 Marks |  |
|  | **Submission of materials check list** **– tick everything off so you don’t loose marks for dumb mistakes** |  |  |
|  | **Your solution (word document) this document is done [ ]** |  |  |
|  | **YOUR NAME AND ID is IN YOU JAVA CODE [ ]** |  |  |
|  | **YOUR NAME AND ID in at the top of this document [ ]** |  |  |
|  | **The Zipped file of your changes ( Java files this word document ) [ ]** |  |  |
|  | **You zip file name only contains your last name and first initial and id ie. DaltonNW124030202022.zip [ ]** |  |  |
|  | **You are using a .zip file and nothing else [ ]** |  |  |
|  | **The zip file does not contain Matchfile.txt [ ]** |  |  |
|  | **The Zip file does not contain Players.txt [ ]** |  |  |