**Freightos**

**Software Development Engineer**

**Qualifying Assignment**

**Name**  :……………………………………

**Sent by HR-**

**Date:** 16/3/2018

**Time:** 19:00 PM

**Submitted by candidate-**

**Date:**

**Time:**

Thank you for your interest in joining Freightos team and congratulations on being shortlisted for this employment opportunity at Freightos.

This **24-hour** assignment will test your skills relating to the professional execution of the Software Development Engineer position’s major job responsibilities. This assignment will test your level of knowledge mainly in Computer Science Fundamentals (coding, algorithms and data structures), OO, and problem solving among other skills.

**Instructions:**

1. Read the below three project descriptions carefully, and add your solution to **ONLY ONE** project. Before submitting your answer, please save the file as “2018 Day Month SDE Name”.
2. Attach a must readme document explaining the approach you followed, and include the following:
   1. Justify why you have selected this project.
   2. Explain why your approach best fits the problem.
   3. The testing scenarios.
   4. How to run the code on windows or Mac if applicable.
   5. Optimization techniques, if any.
   6. A workflow diagram showing the logical flow of the solution. [This is needed to give the reviewers the chance to track and trace the solution]
   7. A UML diagram, if applicable.
   8. Project 1 and 2, coding is a requirement

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**1- Project One:**

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| --- | --- |
| Problem statement | **Input**: You are given one million documents. Assume approximately that the size of every 3,500 documents equals to 1 Gigabytes.  **Assignment**: Provide a solution for counting unique words across all documents. Do not test on small sample, one million is needed. |

**2- Project Two:**

|  |  |
| --- | --- |
| Problem statement | You have a convoy of 100 trucks and a variable amount of boxes to move. Your mission is to distribute the boxes across the trucks in a way that the lightest truck and the heaviest truck weigh almost the same amount. You are given a list of boxes, each with a weight and a volume. Your code must output for each box, in the same order as they were given, in which of the 100 trucks labelled 0 to 99 you decide to place that box.  Each truck can carry a maximum volume of boxes of 100. You should assume the box volumes simply add together on a given truck. There is no limit on the weight of the boxes. If you successfully place each box in the trucks, you will be awarded a score corresponding to the weight difference of your heaviest and lightest trucks (the lower score the better). |
| Input | Integer “boxCount” for the total number of boxes to distribute.  “boxCount” lines of two floats per box (separated by space) which represent the weight and the volume of that box. |
| Output | One line: boxCount space-separated integers for the indices of the trucks in which to place each box, in the same order as they were given.  Note: All the given boxes have an associated truck and none of the trucks have a total volume of boxes greater than 100. |
| Constraints | 100 > boxCount  0 < weight < 100  0 < volume ≤ 26 |
| Testing | Write a program that reads the generated output from the above and then make sure that all the boxes are assigned to valid trucks, and that no truck is carrying a load of more than 100 volume units. |

**3- Project Three:**

|  |  |
| --- | --- |
| Problem statement | **Input**: Provide an object-oriented design for a Clinic appointment system. The clinic hosts different doctors working in multi-shifts. As a patient, the system allows you to fix an appointment and get notification either from the Clinic or the doctors. Events such as cancellation, absence, etc., may occur anytime, therefore the design shall handle such events. Appointments may be for first time appointment or follow-up appointments.  **Assignment**: Provide a detailed UML class diagram showing classes with complete attributes, methods and associations. |