**Introduction**

In this assignment based on the structured problem solving using frameworks, you will be tested on applying the following frameworks on four different case studies:

* 5 WHYs
* 5 Ws
* SPIN Selling Framework
* Issue Tree Framework
* 7Ps Framework

In this assignment, we will test your understanding of applying some concepts from the frameworks mentioned above with the help of the following case studies. The 4 case studies and their problem statements are explained in the subsequent segments. There are reading materials attached along with the problem statements wherever required. These reading materials should be referred to as and how they are asked to in the problem statements.

**What is expected in this assignment?**

The assignment is unlike the previous assignments that you have done in the other courses, where you had to build a model or do analysis based on a dataset. Here, you get a chance of doing a structured problem solving based on some business problems with the necessary explanations of the domain/operations provided.

This assignment expects you to do a little research, reading, and understanding of frameworks through the links we have provided.  
  
You don't have to look for any additional material apart from the ones provided to you for case studies 1 and 3. The case studies 'Big Data Consultant in Complex Data' and 'WalStore Supermarket chain' have no additional reading material provided and just the problem statement is sufficient.  
  
Structured problem solving is often a broad topic and people might work in slightly **different ways while trying to do a root cause analysis**. However, to avoid any ambiguous answers, we have kept the case studies extremely straight forward and to the point.   
  
**In the case study 1 where you will be asked to find the possible root causes**, it is possible you frame your sentences in different ways or justify your answer in different ways. But the final underlying intention for that root cause and that justification remains the same and you will be awarded marks if that is correct.  
  
In the case study 'Big Data Consultant in Complex Data', again you will be asked to fill missing pieces in a conversation by filling in the blank questions. The case study 'WalStore Supermarket chain' asks to fill some type of questions that you will ask while trying to understand a business operation. Again, if the final underlying intention for that root cause and that justification are correct, no matter how you have phrased the question, you will be awarded marks.  
  
For case study 3, you will understand once you read the problem statement that ambiguous answers are anyways not possible and the answer for every question asked there will be to the point.   
  
**Please Note**: It may appear that the case studies are fairly difficult to complete in the given time, but with the right approach followed, you will be able to complete them as this does not require any data analysis or evaluation to be done, and everything required for you to come to the right set of answers are provided to you. You won't need to do any more additional research outside the links provided.

Also, we recommend revisiting this page once you have gone through the problem statement for all the four mini case studies present in the subsequent sections. You will be able to summarize the concepts you applied and map the thoughts you had before starting to solve the case studies and after solving them.  
  
Hope you have a great time doing this assignment! All the best!

**Problem Statement - Case Study 1**

**Case Study 1: Problem Statement**

Imagine you are in 1977 and you work as an air crash investigation officer on the Spanish island of Tenerife. You receive some bad news that two Boeing 747 passenger jets, KLM Flight 4805 and Pan Am Flight 1736, collided on the runway in the airport, which has resulted in the death of 583 people.

You have been tasked with investigating this incident to find the possible root causes for the crash.

**Reading Material**

We request you to go through the following link to understand the scenario of the airport and the disaster; it includes a detailed list of the events and the measures that were taken by the investigation board to ensure air safety for future air travel.

To understand the details of the accident, please go through the material listed below.

<https://en.wikipedia.org/wiki/Tenerife_airport_disaster> - Wikipedia article describing the accident in detail.

The aforementioned link provides details of the root causes of the accident.

Following are two additional links that can further aid your understanding of the common factors that contribute to air crashes.

* <http://aviationknowledge.wikidot.com/asi:tenerife-airport-disaster> – Additional material.
* <https://goflightmedicine.com/tenerife-disaster/> - Additional material.

For the air crash investigation, the **Human Factors Analysis and Classification System** (HFACS) is a well-known model to analyse human factors in accidents. This will also provide you with an issue tree framework to analyse air crashes. It is a simple framework for a problem- solving used in the aircraft industry. You can read about it at the link provided below.

* <https://hfacs.com/hfacs-framework.html>

Following is a detailed PDF to help you answer the second question.

* <https://dvikan.no/ntnu-studentserver/reports/A%20Human%20Error%20Approach%20to%20Aviation%20Accident%20Analysis.pdf>

This book details the application of the HFACS system to analyse air crashes. Refer to tables 3.1 (Pg. 52), 3.2 (Pg. 58), 3.3 (Pg. 64) and 3.4 (Pg. 69), along with the detailed trees provided on pages 71 and 93.

For understanding the detailed definitions of all the levels in the HFACs framework, one can also refer to the link given below

* <https://www.skybrary.aero/index.php/Human_Factors_Analysis_and_Classification_System_(HFACS)>

**Final Output Expected**

Based on these details, answer the questions provided in the excel below.

Case Study 1 – Question Download

The first tab named ‘Analysis’ is the WHY analysis where there are 3 questions given. You are asked to list the possible root causes for the three main questions that are given in **bold** and **highlighted in yellow**.

Some of the root causes can be further divided into sub-root causes, for which additional empty boxes have been provided, which you need to fill, too.

After this, in the second tab that is the HFACs tab in the Excel sheet, you have to fill Column J with a ‘Yes’ or ‘No’ to answer whether that factor is involved in the air crash or not. If the answer is ‘Yes’, write the corresponding reason for that in Column L. Four samples of ‘Yes and No’ answers have been given to you in the Excel sheet.