Project # 1 **Predictive Component Failures /parts in Aerospace**

1. What is the problem you want to solve?

Predict the remaining useful life of aircraft components in order to improve component stock availability, reduce inventory levels of related assets and improve maintenance planning

Dependent:

The future component failures

Independent:

Flight Hours and Cycle (1 takeoff and landing) based on installed and removed parts

2. Who is your client and why do they care about this problem? In other words, what will your client DO or DECIDE based on your analysis that they wouldn’t have otherwise?

Aerospace and Airline companies.

Improve production and/or maintenance efficiency

Reduce operational risk

Reduce unnecessary time-based maintenance operations

Lower inventory costs by reducing inventory levels and predicting the reorder point

3. What data are you going to use for this? How will you acquire this data?

Data Sources:

<https://github.com/Azure/cortana-intelligence-predictive-maintenance-aerospace>

4. In brief, outline your approach to solving this problem (knowing that this might change later).

Build Predictive Maintenance solutions can provide businesses with key performance indicators such as:

An estimate of the remaining lifespan of component parts

Estimated order dates for replacement of parts

Estimated order dates for replacement of parts

5. What are your deliverables? Typically, this would include code, along with a paper and/or a slide deck.

Deliver with code and power point and or slide desk.

Project # 2 **Bike Sharing Demand Predictor**

1. What is the problem you want to solve?

Build a model that will predict how many bikes will be rented during certain weather conditions

2. Who is your client and why do they care about this problem? In other words, what will your client DO or DECIDE based on your analysis that they wouldn’t have otherwise?

Bike City Owners

Provide the owners a predictive market of on-demand healthy transportation, to predict rider demand for any given day

3. What data are you going to use for this? How will you acquire this data?

<http://archive.ics.uci.edu/ml/datasets/Bike+Sharing+Dataset>

<https://www.kaggle.com/c/bike-sharing-demand/data>

The dataset consists of 11 columns that record information about bike rentals: date-time, season, working day, weather, temp, “feels like” temp, humidity, wind speed, casual rentals, registered rentals, and total rentals

4. In brief, outline your approach to solving this problem (knowing that this might change later).

The Bike Sharing dataset has 10,886 observations, each one pertaining to a specific hour from the first 19 days of each month from 2011 to 2012. The dataset consists of 11 columns that record information about bike rentals: date-time, season, working day, weather, temp, “feels like” temp, humidity, wind speed, casual rentals, registered rentals, and total rentals.

The data generated by these systems can be used for studying mobility in a city and to combine historical usage patterns with weather data in order to forecast bike rental demand in the City areas.

5. What are your deliverables? Typically, this would include code, along with a paper and/or a slide deck.

Deliver with code and power point and or slide desk.

Project # 3 **Flight delay prediction**

1. What is the problem you want to solve?

One of the major business problems that airlines face is the significant costs that are associated with flights being delayed due to mechanical problems. This is extremely costly as delays create problems in scheduling and operations, causes bad reputation and customer dissatisfaction along with many other problems.

2. Who is your client and why do they care about this problem? In other words, what will your client DO or DECIDE based on your analysis that they wouldn’t have otherwise?

For passengers: Help customers to decide which airline should you fly on to avoid significant delays?

3. What data are you going to use for this? How will you acquire this data?

The dataset contains flight delay data for the period April-October 2013

<https://www.transtats.bts.gov/DL_SelectFields.asp?Table_ID=236&DB_Short_Name=On-Time>

<https://www.ncdc.noaa.gov/orders/qclcd/>

4. In brief, outline your approach to solving this problem (knowing that this might change later).

The goal of the predictive maintenance solution for these cases is to predict the probability of an aircraft being delayed or canceled, based on relevant data sources such as maintenance history and flight route information

The flight legs and page logs data are used to predict the probability of an aircraft being delayed or canceled. Flight leg data includes data about the flight route details such as the date and time of departure and arrival, departure and arrival airports, etc. Page log data includes a series of error and maintenance codes that are recorded by the maintenance personnel.

5. What are your deliverables? Typically, this would include code, along with a paper and/or a slide deck.

Deliver with code and power point and or slide desk.