**FYP Zeroth Review Preparatory Material**

1. OCEAN Model –

a) O – openness – scale of how open a person is to try new things and is curious about everything.

b) C – conscientiousness – scale of how disciplined and organized a person is in his life.

c) E – extroversion – scale of how energetic and solitary a person is.

d) A – agreeableness – scale of how compassionate and challenging a person is in his life.

e) N – neuroticism – scale of how sensitive minded and resilient a person is.

2. MBTI Model – 16 personality types made up of four letters –

a) Extroversion (E) / Introversion (I) – How do you direct and receive energy? Extraverts are energized by people and activity, while introverts prefer to be alone or with a small group.

b) Sensing (S) / Intuition (N) – How do you take in information? Sensors are focused on information that’s real, tangible, and practical. Intuitives focus more on the big picture, abstract ideas and making connections between the facts.

c) Thinking (T) / Feeling (F) – How do you make decisions? Thinkers make decisions with their head, focusing on logic and reason. Feelers make decisions with their hearts, focusing on their values and the other people involved.

d) Judging (J) / Perceiving (P) – How do you approach the outside world? Judgers prefer structure and order, while Perceivers prefer flexibility and spontaneity.

3. MBTI Dataset – This dataset contains over 8600 rows of data, on each row is a person’s:

a) Type (This persons 4 letter MBTI code/type)

b) A section of each of the last 50 things they have posted (Each entry separated by "|||" (3 pipe characters))

4. Big Five (OCEAN) Dataset – This dataset contains 1,015,342 questionnaire answers collected online by Open Psychometrics. The test consists of fifty items that you must rate on how true they are about you on a five-point scale where 1=Disagree, 3=Neutral and 5=Agree.

5. R-CNN – R-CNN, or Regions with CNN Features, is an object detection model that uses high-capacity CNNs for bottom-up region proposals in order to localize and segment objects. It uses selective search to identify a number of bounding-box object region candidates (“regions of interest”), and then extracts features from each region independently for classification.

6. CNN – A convolutional neural network, or CNN, is a deep learning neural network sketched for processing structured arrays of data such as portrayals. Convolution means, convolving/applying a kernel/filter of nxn dimension on a selected pixel and its surroundings, then moving the same kernel to the next pixel and its surrounding and so on, to assess each pixel. Mainly, CNN is used with images to extract features. CNN applies filters to each pixel of the image to examine the feature type which this pixel belongs to.

7. SVM – Support Vector Machine or SVM is a supervised learning algorithm which is used for classification as well as regression problems. The goal of SVM is to create the best line or decision boundary that can segregate an n-dimensional space into classes so that we can easily put the new data point in the correct category in the future. This best decision boundary is called a hyperplane.

8. Random Forest – Random Forest is an ensemble technique capable of performing both regression and classification tasks with the use of multiple decision trees and a technique called Bootstrap and Aggregation, commonly known as bagging. The basic idea behind this is to combine multiple decision trees in determining the final output rather than relying on individual decision trees. Random Forest has multiple decision trees as base learning models. We randomly perform row sampling and feature sampling from the dataset forming sample datasets for every model. This part is called Bootstrap. It then combines the output of multiple decision trees to reach a single result. This part is called Aggregation.

Random forest algorithms have three main hyperparameters, which need to be set before training. These include node size, the number of trees, and the number of features sampled.

9. WEKA tool – An open-source software that provides tools for data preprocessing, implementation of several ML algorithms, and visualization tools so that you can develop machine learning techniques and apply them to real-world data mining problems.

10. TF-IDF Vectorization – Term frequency - Inverse document frequency (TFIDF) is based on the Bag of Words (BoW) model, which contains insights about the less relevant and more relevant words in a document.

𝑡𝑓𝑖𝑑𝑓𝑖,𝑗 = 𝑡𝑓𝑖,𝑗 ∗ log (𝑁/𝑑𝑓𝑖) - (1) where,

𝑡𝑓𝑖 𝑑𝑓𝑖,𝑗 = tf-idf weight for token i in document j.

𝑡𝑓𝑖,𝑗 = Number of occurrences of token i in document j.

𝑑𝑓𝑖 = Number of documents that contain token i.

*N* = Total number of documents.

11. RAVDESS Dataset – The RAVDESS contains 24 professional actors (12 female, 12 male), vocalizing two lexically-matched statements in a neutral North American accent. Speech emotions includes calm, happy, sad, angry, fearful, surprise, and disgust expressions. Each expression is produced at two levels of emotional intensity (normal, strong), with an additional neutral expression.

12. SAVEE Dataset – The SAVEE database was recorded from four native English male speakers, postgraduate students and researchers at the University of Surrey aged from 27 to 31 years. Emotion has been described psychologically in discrete categories: anger, disgust, fear, happiness, sadness, and surprise. Neutral (calm) has been added to provide recordings of 7 emotion categories.

13. CK+ Dataset – The Extended Cohn-Kanade (CK+) dataset contains 593 video sequences from a total of 123 different subjects, ranging from 18 to 50 years of age with a variety of genders and heritage. Each video shows a facial shift from the neutral expression to a targeted peak expression, recorded at 30 frames per second (FPS) with a resolution of either 640x490 or 640x480 pixels. Out of these videos, 327 are labelled with one of seven expression classes: anger, calm, disgust, fear, happiness, sadness, and surprise.

14. IMED Dataset – The dataset consists of 19 classes of emotions, such as happy, sad, angry, etc., demonstrated by six male and nine female subjects. There are 6 basic emotions, 12 mixed emotions, and neutral facial expression in video and image format. All participants are Indonesian, aged from 17 to 32 years old, from various ethnicities includes pure and mixed of Javanese, Bataknese, Sundanese, Minang, and Manadonese.

15. libROSA Python Library – libROSA is a python package for music and audio analysis. It provides the building blocks necessary to create music information retrieval systems.

16. MTCNN Dataset – MTCNN or Multi-Task Cascaded Convolutional Neural Networks is a neural network which detects faces and facial landmarks on images. The process consists of three stages of convolutional networks that are able to recognize faces and landmark location such as eyes, nose, and mouth.

17. ImageNet Dataset – ImageNet contains 14,197,122 high-resolution images, useful for many computer vision applications such as object recognition, image classification, object localization etc.