**Customer Segmentation & Its Impact On Business Strategy Analysis**

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**Appendix A**

**CEP Mapping**

**Ks are addressed through the project and mapping among Ks,COS and POS**

| **Ks** | **Attribute** | **How ks are addressed through the project** | **CO** | **PO** |
| --- | --- | --- | --- | --- |
| **K2** | Mathematics | Details and basic of Knowledge Statistics | **CO-1** | **PO-a** |
| **K3** | Engineering  Fundamental | Knowledge about Machine Learning, Different types of Learning, Machine Learning Algorithms, Data Analysis Tool, and Python Language, and different types of Framework. | **CO-1**  **CO-2** | **PO-a**  **PO-b**  **PO-c** |
| **K4** | Specialist  Knowledge | Developing Dataset, Data Cleaning, Data  Processing, Data Normalization, Feature  Extraction, Design, Train & Test. | **CO-1**  **CO-2** | **PO-a**  **PO-b**  **PO-c**  **PO-e** |
| **K6** | Engineering Practice | Knowledge of programming language python, knowledge of using library, Machine learning based model, Understanding data, idea of large data set, classes of machine learning problem | **CO-1**  **CO-2** | **PO-a**  **PO-c**  **PO-e** |
| **K8** | Research  Literature | The research requires a detailed study of the  related research field and other sources and  documentation | **CO-1**  **CO-5** | **PO-a**  **PO-d**  **PO-h** |

**Ps are addressed through the project and mapping among Ps, COs, and POs**

| **Ps** | **Attribute** | **How Ps are addressed through the project** | **CO** | **PO** |
| --- | --- | --- | --- | --- |
| **P1** | Depth of  Knowledge  Requirement | Basic & advance statistics knowledge(**K2**)  Project requires study of research on Data Science, Data Analysis & Machine Learning Algorithms (**K8**)  Data collection from Online shop, super shop, e-commerce site (Facebook page) **(K3, K4)**  knowledge of using Library, Machine learning Based Model, Understanding Data, Idea of Large Data Set, Classes of Machine Learning Problem (**K6**) | **CO-1**  **CO-2**  **CO-8** | **PO-a**  **PO-b**  **PO-c**  **PO-d**  **PO-j**  **PO-l** |
| **P2** | Range of Conflicting Requirements | Developing a practical machine learning model with proper regularization with low variance while limited given data will be used. If the learning process is unsupervised or reinforcement rather than supervised learning, then accurate segmentation will be commuted | **CO-2**  **CO-4** | **PO-a**  **PO-c**  **PO-g** |
| **P3** | Depth of Analysis Required | A huge algorithm can be adopted but choice of the selected algorithm requires in-detail and depth analysis | **CO-1**  **CO-2** | **PO-a**  **PO-b**  **PO-d**  **PO-l** |
| **P4** | Familiarity of  Issues | CSE graduates are not typically familiar with customer management, business analytics and business policy. | **CO-5** | **PO-f** |
| **P5** | Extent of  Applicable Codes | We maintained user privacy carefully as well as took other ethical approaches and usedopen-licensed tools to develop the system. | **CO-5**  **CO-6** | **PO-f**  **PO-h**  **PO-i** |
| **P6** | Diverse Groups | People of all ages and classes are involved specially the more loyal people | **CO-6** | **PO-i** |
| **P7** | Interdependence | Research involves a number of sub-system like Data Collection, Training Dataset, Machine Learning Algorithms, Data Analysis,Data Processing. | **CO-3**  **CO-6**  **CO-8** | **PO-c**  **PO-i**  **PO-j**  **PO-k** |

**Addressing Complex Activities (As) through the project**

| **As** | **Attribute** | **How As are addressed through the project** |
| --- | --- | --- |
| **A1** | Range of Resources | The project requires the use of diverse  resources including different types of **materials**, **Information’s**: dataset (test & training), **Datase**t(Link:) **people**: (Members: Tanveer Ahamed Rabby,Md.Efti Khirul Alam,Sharmin Akter) |
| **A2** | Level of  interaction | The level of interaction between the group members has been varied when it comes to making the dataset in our model. By using data analysis & Machine learning algorithms to segment customers from a large dataset for a particular company. |
| **A4** | Consequences for society  and the environment | By segmenting customers, it can be easy to understand the divergence between loyal customers and so-called customers. If we can segment the customer which contains some features, it can be easier for a businessman or a company to realize the loyal and targeted customer which will be a more efficient way for business. |
| **A5** | Familiarity | The project deals with data analysis and machine learning algorithms for segmenting customer and market basket analysis for learners. |

**Course Outcomes (CO) with PO mapping for this project**

| **CO No.** | **CO Statements** | **Corresponding**  **POs** |
| --- | --- | --- |
| **CO1** | We identified, formulated, and analyzed the real-world problem of Supershop/E-commerce by segmenting their customer analyzing dataset. | **a**  **b**  **d**  **l** |
| **CO2** | We proposed a solution using data science and machine learning algorithms to segment the customer for any kind of enterprise as well as find the most selling item of a company. | **a**  **c**  **e** |
| **CO3** | Expected completion time of 6 months,initially for analysis no budget required. | **k** |
| **CO4** | Marketers can be extra efficient in phrases of time, cash, and other sources through segmenting their facts. Marketplace segmentation permits organizations to have a higher understanding in their clients. They gather a greater draw close to the requirements and desires of customers, allowing them to personalize campaigns to the consumer groups most likely to buy objects. | **g** |
| **CO5  CO5** | Understood the concept of professional ethics, confidentiality,  industrial standards, risk-benefit analysis and explained the impact of engineering solutions in social safety,data safety, and welfare from the Code of Ethics (https://www.acm.org/code-of-ethics) | **f**  **h** |
| **CO6** | Function effectively in a multidisciplinary team | **i** |
| **CO8** | The present design,analysis,analysis output, documentation through oral presentations | **c**  **j** |

**Washington Accord Program Outcomes (PO) for engineering programs**

| **No.** | **PO** | **Differentiating Characteristic** |
| --- | --- | --- |
| **a** | Engineering Knowledge | Breadth and depth of education and type of  knowledge, both theoretical and practical |
| **b** | Problem Analysis | Complexity of analysis |
| **c** | Design/ development of  solutions | Breadth and uniqueness of engineering  problems such as the extent to which problems  are original and to which solutions have  previously been identified or codified |
| **d** | Investigation | Breadth and depth of investigation and  experimentation |
| **e** | Modern Tool Usage | Level of understanding of the  appropriateness of the tool |
| **f** | The Engineer and Society | Level of knowledge and responsibility |
| **g** | Environment and  Sustainability | Type of solutions. |
| **h** | Ethics | Understanding and level of practice |
| **i** | Individual and Team work | Role in and diversity of team |
| **j** | Communication | Level of communication according to type  of activities performed |
| **k** | Project Management and  Finance | Level of management required  for differing types of activity |
| **l** | Lifelong learning | Preparation for and depth of Continuing  learning. |