MTD 3043: ANALISIS DAN REKA BENTUK SISTEM / *SYSTEM ANALYSIS AND DESIGN*

SESI PENGAJIAN: SEM 2 (2021/2022)

KUMPULAN KULIAH MTD 3043 (A211): A

(TUTORIAL 3)

DATA FLOW DIAGRAM [DFD]

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**NAMA PENSYARAH: PUAN HARNANI BINTI MAT ZIN**

1. Describe <mark>data and process modeling</mark> and name the main data and process modeling techniques.

   - A process-centered approach is data and process modeling. It concentrates on data flow and the processes that impact it. A systems analyst creates graphical models to explain how the system turns data into meaningful information during data and process modeling. Data and process modeling produces a logical model that supports business activities and meets user requirements. Data flow diagrams (DFDs), the data dictionary, and process description tools are the three basic data and process modelling methodologies.

2. Describe the <mark>Gane and Sarson symbols</mark> used for <mark>processes, data flows, data stores, and entities</mark>. Give four examples of typical names for processes, data flows, data stores, and entities.

   - **Process** - Receives data as input and outputs data with a different content, form, or both. A black box is what it's called. A rectangle with rounded sides is the Gane and Sarson sign for a process. The process's name is written inside the symbol. *Apply Payment, Create Invoice, Verify Order,* and *Assemble Order* are some examples of common process names.
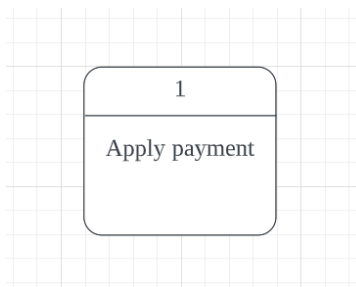

   - **Data Flow** - One or more data items are represented by this object. A data flow is represented by a line with a single or double arrowhead. The data flow's name is written above, below, or beside the line. The arrowhead on the line indicates the direction in which the data flows. *Order, Accepted Order, Payment,* and *Inventory Change* are some examples of common titles for data flows.
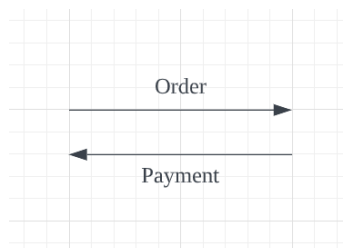
- **Data Store** - Represent the data that the system keeps track of. Because you're only interested in a logical model, the physical qualities of a data storage are irrelevant. A data storage is represented by a flat rectangle with the right side open. The data store's name is written inside the symbol. *Daily Payment, Account Receivable, Student Details,* and *Order Database* are some examples of common names for data storage.

- **External Entity** - The entity's name appears inside the symbol. A person, department, outside organization, or other information system that sends data to or gets output from the system is referred to as an entity. In both sets, the symbol representing an external entity is a square. The external entity's name is written inside the symbol. *Customer, Supplier, Student,* and *Instructor* are some examples of common entity names.
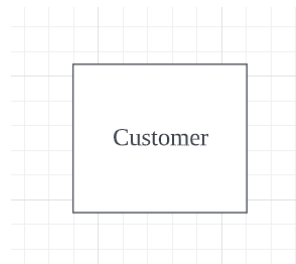
3. What is the ==relationship between a context diagram and diagram 0==, and which ==symbol is not used in a context diagram==?

- Only one process symbol, process 0, appears in the context diagram, and it represents the whole system. On the context diagram, Diagram 0 is a more comprehensive, expanded, partitioned, or decomposed version of process 0. Diagram 0 depicts the information system's key operations, data flows, and data repositories. The letter "O" is the only symbol that isn't used. In a context diagram, the data storage symbol is not utilized. Only utilize a data store if it is shared by two or more processes.

4. What is meant by an ==exploded DFD==?

- A more detailed or extended form of a higher-level process is an exploded data flow diagram.

5. Describe a data dictionary and give examples of how and when it is used.

    *   A data dictionary, also known as a data repository, is a central repository for information on the data in a system. The data dictionary is used by analysts to gather, document, and categories particular system information. All data elements and valid combinations of data components are also defined and described. A data dictionary may be used to comprehend where a data item belongs in the structure, what values it may include, and what the data item signifies in real-world terms while designing programs that use the data model. A bank or a collection of banks, for example, might represent the data objects used in consumer banking. They may then supply a data dictionary to programmers at a bank. The data dictionary for consumer banking would describe each of the data elements in the data model (for example, "Account holder" and "Available credit").

6. Explain the DFD leveling technique.

    *   Exploding, dividing, or decomposing are all terms used to describe the process of levelling. Leveling is a strategy for depicting an information system's graphical model as a single process, then in increasing and greater detail until all processes are functional primitives.

7. What is a balanced DFD?

    *   The input and output data flows of the parent process are kept on the child data flow diagram in a balanced data flow diagram.

8. What is structured English?

    *   Structured English is a subset of regular English that is used to convey logical processes clearly and properly.

9. You are the IT director at Humra University. As part of a training program, you decide to draw a DFD that includes some obvious mistakes to see whether your newly hired junior analysts can find them. You came up with the diagram 0 DFD shown in Figure 1. Basedon the rules explained in this chapter, how many problems should the analysts find?
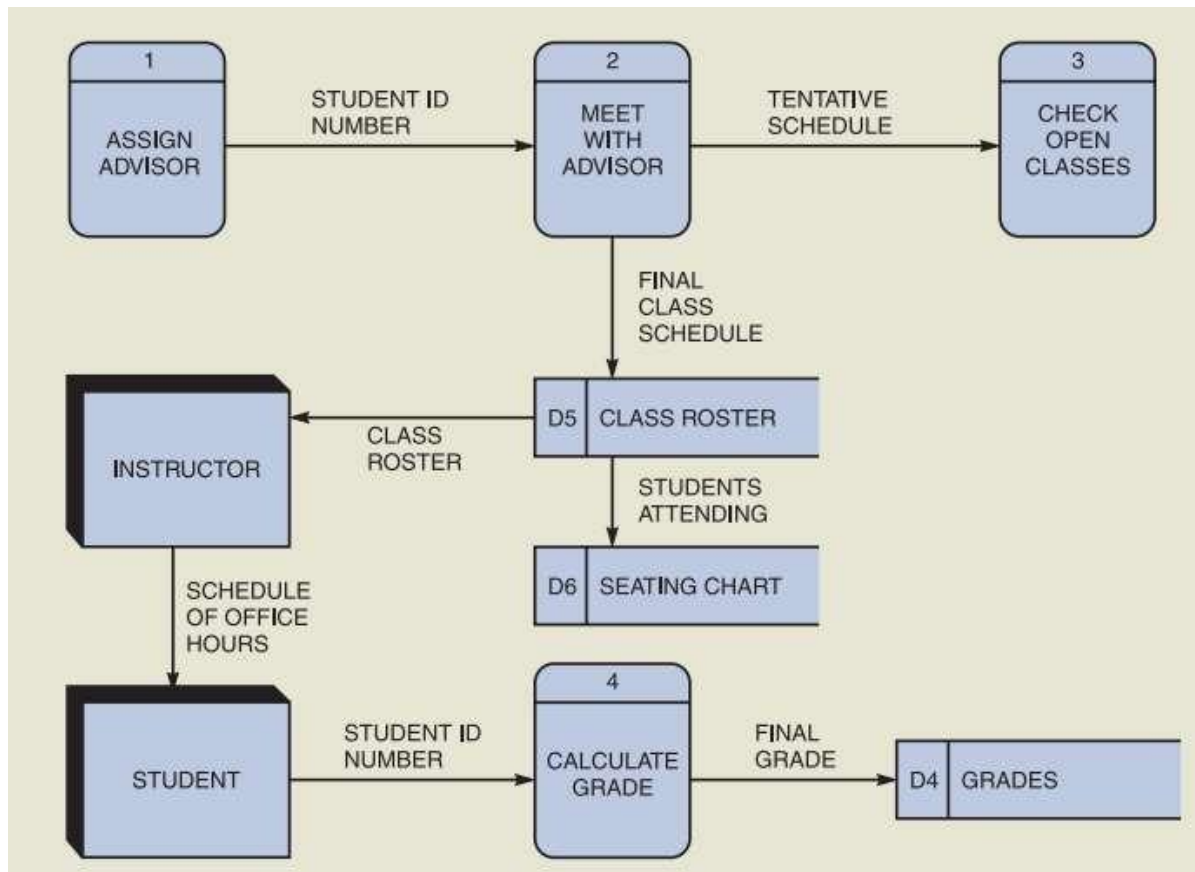
- The following are some of the errors;
    1. ASSIGN ADVISOR, procedure 1, is a **miracle**.
    2. Process 3 of CHECK OPEN CLASSES is a **black hole**.
    3. Process 4 of CALCULATE GRADE is a **gray hole**.
    4. External entities such as INSTRUCTOR and STUDENT **cannot be attached to a data flow**.
    5. The INSTRUCTOR entity also **isn't linked to any processes**.
    6. The data storage for GRADES is **black holes**.
    7. The data storage for SEATING CHART is **black holes**.
    8. The data stores for the CLASS ROSTER are **not compatible connected to a data flow**.
    9. The data stores for the SEATING CHART are **not compatible connected to a data flow**.

INSTRUCTION:

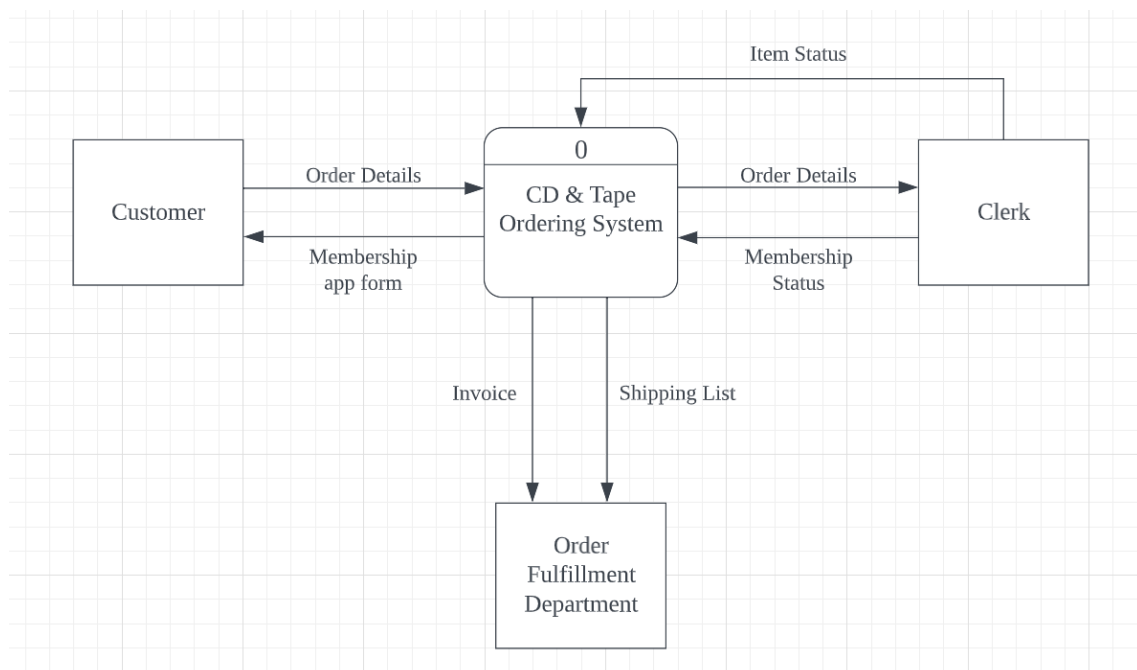**Draw the context diagram and DFD based in the scenario given.**

SCENARIO 1

A mail order company distributes CDs and tapes at discount prices to record club members. When an order processing clerk receives an order form, she verifies that the sender is a club member by checking the MEMBER FILE. If the sender is not a member, the clerk returns the order along with a membership application form. If the customer is a member, the clerk verifies the order item data by checking the ITEM FILE. Then the clerk enters the order data and saves it to the DAILY ORDERS FILE. At the same time the clerk also prints an invoice and shipping list for each order, which are forwarded to the ORDER FULFILLMENT DEPARTMENT for processing there.

(a) Identify the entity, process, data flow, and data store in the given scenario.

- **Process** – *Verify Membership, Verify Order Item,* and *Process Order.*

- **Data Flow** – *Order, Order and Membership application, Verified Member Order, Items Ordered, Invoice and Shipping List, Data Ordered, Item,* and *Member.*

- **Data Store** – *Member File, Item File,* and *Daily Order Item.*

- **Entity** – *Non-Member, Club Member,* And *Order Fulfillment Department.*

(b) Draw a context diagram for this problem.

(c) Draw the DFD for this problem.
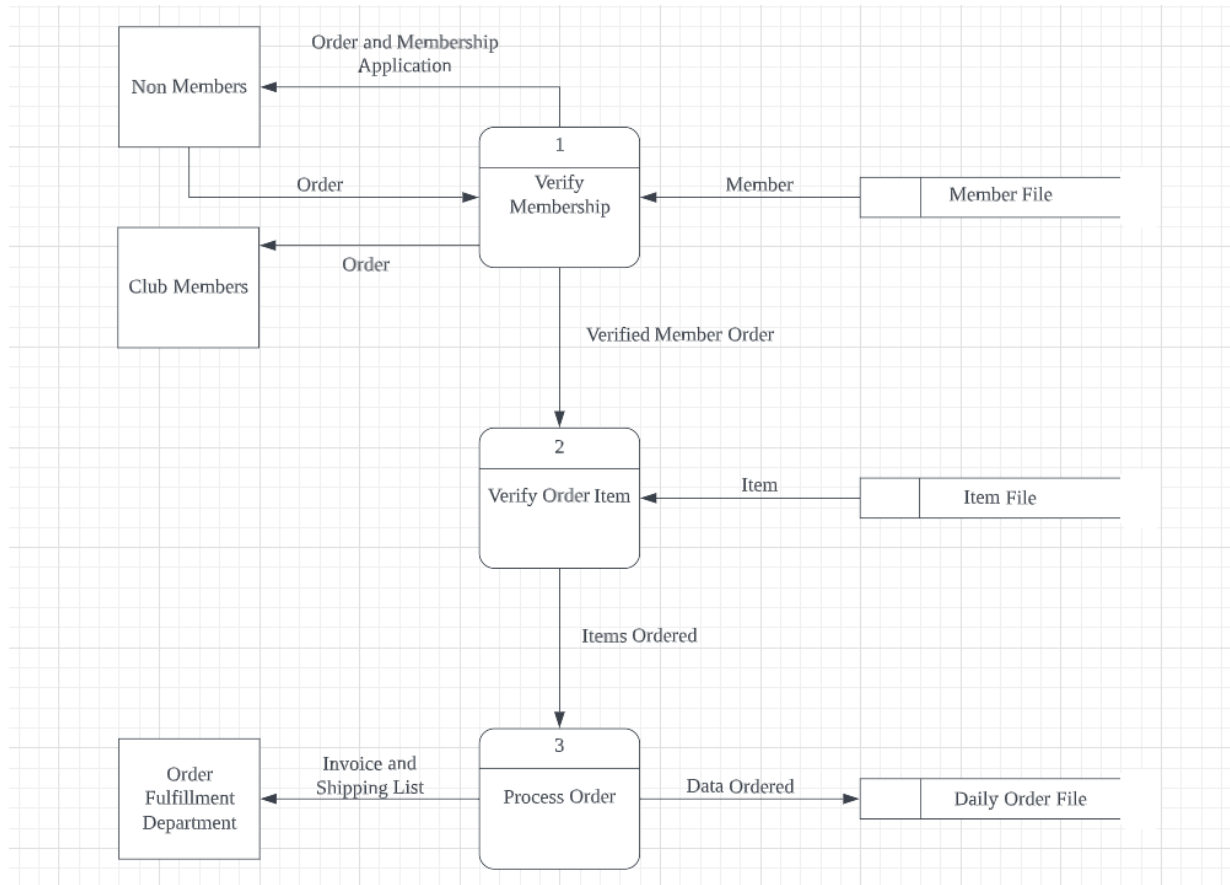
SCENARIO 2

Draw the context diagram and DFD for a distance education university. The enrolment process works as follows: Students send in an application form containing their ==personal details, and their desired course==. The university ==checks that the course is available==, and that the student has necessary ==academic qualifications==. If the course is available the student is ==enrolled in the course==, and the university ==confirms the enrolment== by sending a ==confirmation letter to the student==. If the course is unavailable the student is ==sent a rejection letter==.

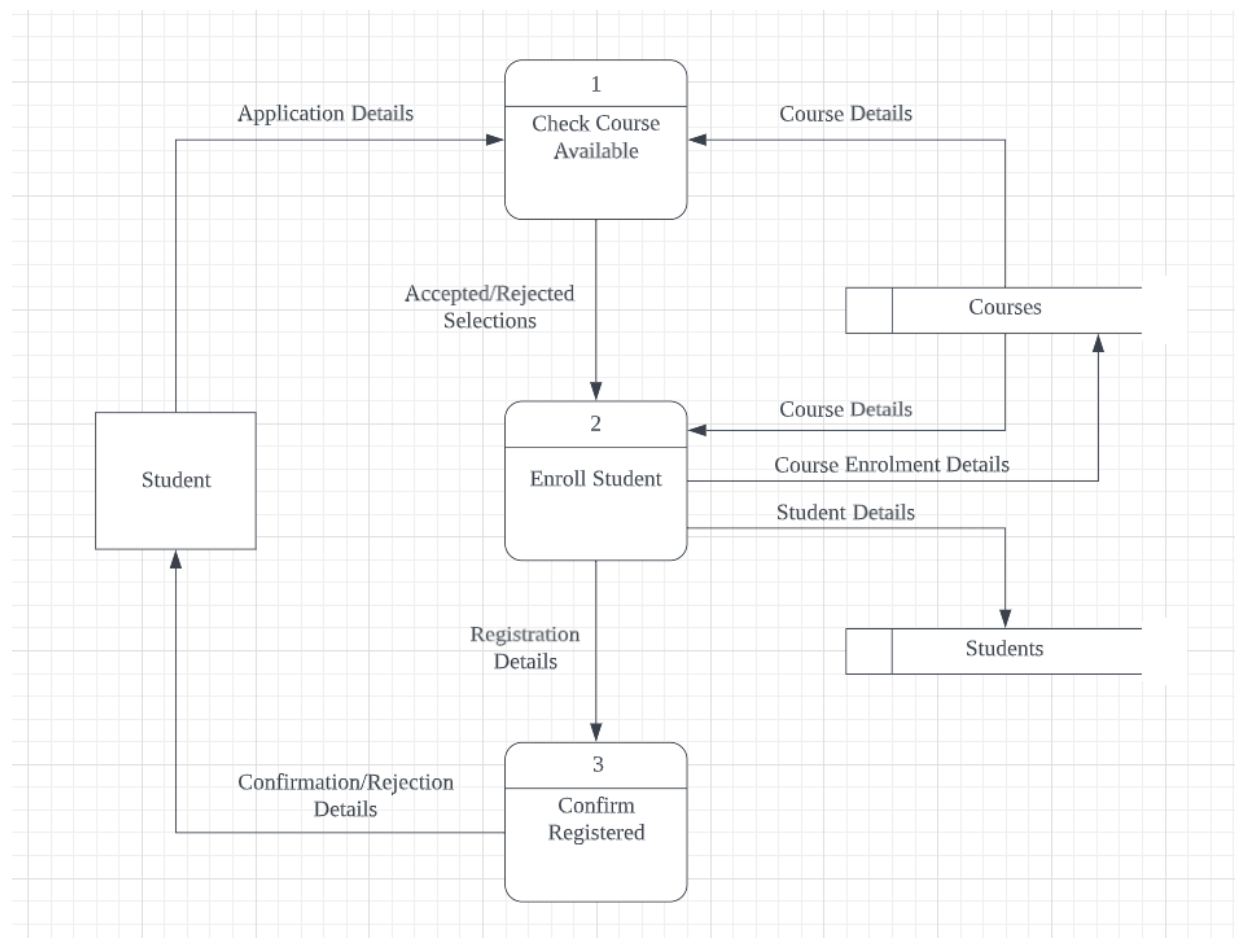==Process, Data Flow, Data Store, and Entity==:

- **Process** – *Check Course Available, Enroll Student,* and *Confirm Registered.*
- **Data Flow** – *Accepted/Rejection Selection, Registration Details, Confirmation/Rejection Details, Application Details, Course Details, Course Enrollment Details,* and *Student Details.*
- **Data Store** – *Courses* and *Students.*
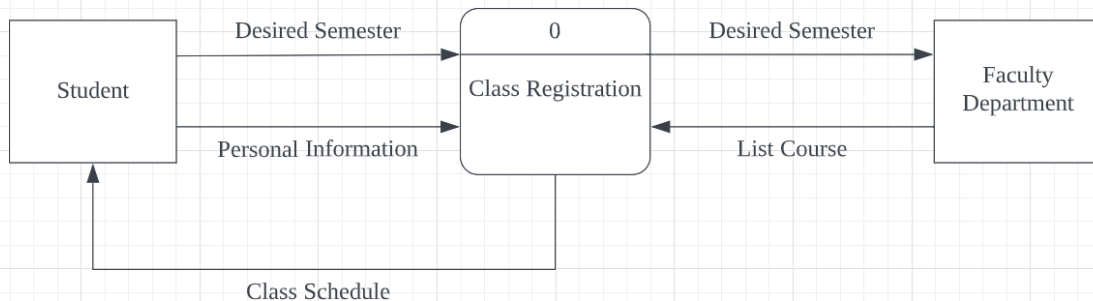- **Entity** – *Students.*

==Context Diagram==:
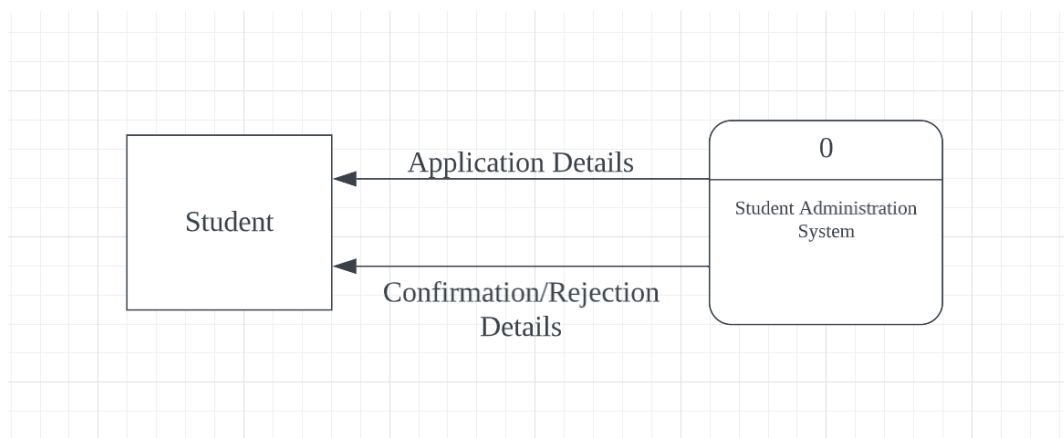
SCENARIO 3

UPSI is one of the universities in Malaysia that used computer-based system for the class registration. Firstly, the students can <mark>view list</mark> of the course offered by entering their desired semester. The list of courses is extracted from Course database that already update in advance by the faculty's department. The students also can <mark>view the class schedule</mark> for each course. This schedule will be extracted from Class Roster database. If the student finds their suitable course, they can proceed with the course registration by <mark>entering their personal information</mark> such as matric number, name, semester, and so on. The registration details will be kept in Registered Student database which can be <mark>viewed</mark> by the faculty's department later. The students also can print their class schedule for future reference.

<mark>Process, Data Flow, Data Store, and Entity</mark>:

- **Process** – *Course Offered, Class Schedule and Insert Information Details*
- **Data Flow** – *List of course, Updating, Printing Schedule, Registration Details, View, Suitable Course and Extracted.*
- **Data Store** – *Course Database, Class Roster Database and Registered Student Database*
- **Entity** – *Students and Faculty*

<mark>Context Diagram</mark>: