Learning Summary Report

DATABASE, ANALYSIS AND DESIGN / INF10002

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# Self-Assessment Details

The following checklists provide an overview of my self-assessment for this unit.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Pass (D) | Credit (C) | Distinction (B) | High Distinction (A) |
| Self-Assessment |  |  |  |  | **✔** |

Self-Assessment Statement

|  |  |
| --- | --- |
|  | Included |
| Learning Summary Report | **✔** |
| Test 1 and Test 2 are Completed (at least 10/20) | **✔** |
| 5 Pass tasks are Complete | **✔** |

Minimum Pass Checklist

|  |  |
| --- | --- |
|  | Included |
| 5 Credit tasks are Complete | **✔** |

Minimum Credit Checklist (in addition to Pass Checklist)

|  |  |
| --- | --- |
|  | Included |
| Distinction task are Complete | **✔** |
| Test 3 is Completed | **✔** |

Minimum Distinction Checklist (in addition to Credit Checklist)

|  |  |
| --- | --- |
|  | Included |
| High Distinction task is completed | **✔** |
| Custom project meets HD requirements | **✔** |

Minimum High Distinction Checklist (in addition to Distinction Checklist)

Declaration

I declare that this portfolio is my individual work. I have not copied from any other student’s work or from any other source except where due acknowledgment is made explicitly in the text, nor has any part of this submission been written for me by another person.

Signature: **Hai Hoang Le**

# Course Overview

Databases are accustomed to creating, storing, organizing, and disseminating data. During this course of INF10002, we learned the basic principles for the effective design and use of databases. We unpack the notion of information and introduce contemporary tools and techniques for storing, retrieving, exploiting, and visualizing data. We would gain an understanding of knowledge modeling and style approaches, and therefore the emerging opportunities afforded by big data, social media, data analytics, and unstructured data. We particularly specialize in commercial and open-source direction tools.

# Major learning Topics

1. Microsoft Access
2. Microsoft Power BI Desktop
3. Structured Query Language (SQL)
4. Entity Relationship Diagrams (ERD)
5. Normalization
6. No SQL database
7. Data warehouse (DW)
8. Transactions

# Work Overview

In the following section, the report is going to describe all the stages of the course INF10002 which includes all the topic’s focus points as well as the whole tasks that we have to finish every weekend for pass, credit, and distinction that I am trying to approach through this report. In addition, the section will contain many various challenges that I faced during the working periods, it also contains expectations regarding the studies, as well as techniques for the future and some of the methods that I used to help me understand each unit, and complete all the pass, credit and distinction tasks to touch the distinction grade for the spring semester. Still, one but most important for our lecturer, Mr. Pham Thai Ki Trung, who gave his passion, experience, and knowledge to support us, and much real-life simple that created a vivid image of how a database of an organization works in our mind to learn and practice.

## Week 1 - 3: Introduction to Microsoft Access Database

In the first week 1 of the course, we were given an overview of the database concepts, a relational model (RM), a relational database management system (RDMS), Access, Table, Record, Primary Key, Foreign Key, and some demonstration of Filter and Query. Mr. Trung explained to us the concept of a database. A database is the storage of an organization that is used for storing data, this can be a simple explanation. However, questions appear, what is the difference between a database with a storage device (HDD, SSD, USB)? A database is used for storing data and information, but it stores all data in order, that is why it is different from a storage device. The data that is stored is represented as two-dimensional tables. Each dimension has properties: a set of columns with unique names/ attributes and a set of unnamed rows that for input in, both columns and rows are irrelevant. All of these data must be stored in order in the Relational Database Management systems like a pattern. Then, Mr.

Trung instructed us to download and create a database site in Microsoft Access, we watched him create a table and set up name and data as well as set a primary key for each table. A table must have a Primary key which has a role of an identifier for each record that the user put in

the table. As a record that has a primary key, it will become unique and there are no duplicates. In the end, he showed us simple filters or queries to see the ability access to filter the data from the records that he had already input.

Next in week 2, We began to practice on Microsoft Access for the first Task that we need to finish. I felt a bit of worry about the task because this is the first time I try Access which is a real program used such as a big business, although I already know about Excel. We learned more about the Primary key and Foreign key which can’t be indispensable in the relationship between tables. We are required to run some kind of queries to test the amount of data from tables that the tasks provide for us. In practicality, a movie will be cast by many actors, each actor will have their name, surname, date of birth, and the most important is actorID which is the primary key for the actor table. With queries, I can see who is cast in what movie, the actor that was cast in the most movie. There are some queries that I didn’t know so I started watching more tutorials about the queries in Access from Youtube as well as reviewing available code on Stackoverflow and W3School. These websites took an important part in my studies period to have a view of people around the world use queries and I learned a lot from there.

In the third week, we are instructed to import and export a CVS extension file or txt extension file by Access and I see it is very practical when I go out for work in the future. This week, we also learn more about the calculation function in Access such as the Delete, the Update, and the SUM queries to count data in tables. Through the first three weeks, I can have minor knowledge of working with the data in Access, however, It is a few skills that are needed in a real job, I still need more practice and explore more abilities that Access can do with the data

## Week 4: Introduction to Microsoft Power Bi

In the 4th week, we started to work with a new application from the Microsoft company, it Is the Power Bi which is a very popular application used in business for creating charts, diagrams, tables to visualize data in a vivid way which is for analyzed and review by data analyzer. First, I had no idea with is Power Bi is, as usual, Mr. Trung would be instructed us to download and he

provided some demonstration for us to have a view of the application to finish the task. At first, I tried to work with the Power Bi and It challenged me a lot I lost a few days to understand what I need to do to create a visualization. Because It is mostly for business, I expect the application will be more user-friendly, however, I still need more and more practice to be better in visualization. For the final week of the course, Mr. Trung invited a Professor from Thien Long Group to come and demonstrate how Power Bi is used for his job as a data analyst.

## Week 5 – 9: SQL and ERD

In week five, it means we are finished half of the course and it is focussing on the main topic of the course. In this period, we started to learn many new concepts that are used in the business system. We learned more about the Entity-Relationship Diagram (ERD), we understood the meanings of the attributes, entities, composite attributes, and composite primary key. From the videos in the course, we were confident when looking at an ERD of a simple business and seeing it works as well as understanding how their database is organized from there we learned and can create ERD from a narrative that the task asks us to draw. Also, there are two relationship types in an ERD, the first is Many-to-Many (M: M), and second is the One-to-Many (1:M). Going to further at task 5 which requires us to draw an ERD for a motorbike maintenance company, I spent 4 hours completing it and It challenged me a lot. The more practice I did, the better I am now. There was an important thing that this week covered is the Structured Query Language (SQL). Swinburne University provides us a Portal to the school iSQL database for students to practice and complete the task there. At first, it was not easy for me to understand the SQL code, but after I read all the documents provided on Canvas as well as watched the recorded in class, I did understand all the steps to create a table, create an attribute, primary keys, foreign keys between table, and insert record to test my code. It was not very hard when we understand the logic in the SQL. It was very pleasant for W3school when the website can be seen as a source to find the function such as inner join function, distinct function,… In my opinion, the course from week 5 to week 9 is a little bit hard, but if we are hard-working it is not difficult at all, and this part is the main thing that students need to understand in the INF10002 because most company database is most depended on a well-structured ERD and SQL.

## Week 10 - 12: Normalization – NoSQL – JSON – WD – Transaction

In week 10, we learned about Normalization. It is a database design technique that simple larger tables into small tables which are connected by using relationships. Secondly is about the NoSQL database server, how it works and how popular NoSQL is in today’s world. Mr. Trung also about the JSON and the Data warehouse (DW). We are introduced to the transactions topic in the banking system which is set by many updated SQL statements when we want to deposit, withdraw, and send money. It was interesting when a value is changed, the other values in the different tables will change as well.

# Learning Outcomes

* Using Microsoft Access
* Import and Export between a database application
* Identify, set up the primary key for a new table
* Using query, SQL code to search and filter data
* Using data to analyze and point out problems as well as solution
* Using Power Bi to visual information to table, chart, table
* Using SQL to create, insert, and complex SQL for data
* Understand the meanings of ERDs in business
* Draw ERDs for each type of business using 1:M or M: M relationship
* Combine many tables with SQL

# Reflection

## Part 1

The most challenging port of the course now is the Entity Relationships Diagram (ERD) where each type of business I need a different a ERD which is best suit for that business and it also based on the aim from that organization which they want to focus on profit, on customer. In my opinion, the most inspired me is learning about the SQL when it is very practical not only in the course but also for the future when I would become a data analyst and I would appreciate it if I learned the basics that is SQL. The most interesting thing is how the data is related to each other by using the primary key between tables, just using SQL or Query I can look up the information I want immediately.

Not only learning from the course, but I also learned from the Internet such as Youtube, Stackoverflow, and W3school to understand more about the database. These skills that I learned from this course will be along with me after my graduation and beyond there when I have an internship or a real IT job.

I used to think that the course would be easier the first time, so I did not pay much attention to the course until I failed the first Test which I only get 9/20, and I am very worried about that could affect my final grade. I controlled myself again and pass test 2 with a score of 16/20 as well as completed all pass and credit tasks on time to prove that I am good to get the Distinction grade in this course.

Throughout the task I have finished, I always have a small analysis from each query run successfully, their analysis is not required in the task but it is very good for my critical thinking skills as well as making an assumption about the data that I got.

I have a project about making a website for a business selling baby equipment in the ICT10001, and with the knowledge, I learned from the course I can develop a better database that stored the customers’ information as well as products.

## Part 2

In my desire to get a Distinction grade, I completed the Distinction task and I think it is not to hard to finish it, I knowledge I learned from week 1 to 12, It is suitable for students to take time to understand and finish. Although there are some technical problems in some steps I quickly search for solution and finish the task on time.