MODELING AND SIMULATION LABORATORY
INDUSTRIAL ENGINEERING STUDY PROGRAM
UNIVERSITAS SUMATERA UTARA

PRACTICUM MODULE

COMPUTER PROGRAMMING COURSE

NAME:

NIM:

2024/2025

PREFACE

All praise be to God for the glory and blessing of grace, the authors were given the chance to conceive this handbook for Computer Programming Practicum Material. The preparation of this handbook is intended as a guide to the implementation of the Computer Programming Program of the Industrial Engineering Study Program, Faculty of Engineering, University of Sumatera Utara.

On this occasion, the authors would like to profusely thank the Chancellor of the University of Sumatera Utara (USU), the Dean of the Faculty of Engineering of USU, and the Head of the Industrial Engineering Study Program of USU, as well as all those who participated in the process of drafting this handbook from its inception until the completion of the compilation process.

With all of the existing limitations, the authors hope this handbook can provide a broader insight to the readers. The authors realize this handbook still needs improvements in accordance with the development of science, especially in computer and software implementations.

Medan, February 2025

Head of Modeling and Simulation Laboratory

Ir. Khalida Syahputri, ST., MT.

NIP: 197806132008122001

A. PREREQUISITES

Prerequisites that must be fulfilled before participating in practicum activity are as follows:

1. Registered administratively by the Industrial Engineering Study Program, Faculty of Engineering, University of Sumatera Utara, as evidenced by study plan card (Kartu Rencana Studi/ KRS).
2. Registered and completed the Training of Python for Data Science with Anaconda 2024.
3. Signed up for the computer programming course.

B. REGULATIONS AND PROCEDURES FOR COMPUTER PRORAMMING COURSE ASSIGNMENT

Regulations and procedures for computer programming course assignments that must be obeyed for participating in practicum activities are as follows:

1. Students are required to wear neat clothes (shirts, long pants, and lace-up shoes) during practicum activities.
2. Students are required to bring equipment to each practicum activity as instructed by the assistant. If students cannot complete the instructed equipment within 15 minutes, they will be sanctioned in the form of a 5-point reduction in value according to the practicum activities being undertaken.
3. Students are required to be present 15 minutes before the practicum activity.
4. Students who are late by less than 15 minutes will incur a deduction of 5 points, and a deduction of 10 points will be applied if the lateness exceeds 15 minutes from the practicum activities being undertaken.
5. During assignment accomplishment, **students must**:
    a. Examine the assignment with the assistant that has been appointed.
    b. Accomplished the assignment of all modules.
6. Students who smoke during practicum activities will be sanctioned in the form of a reduction in value by 15 points and are considered absent from the practicum activities being undertaken.

7. Students will be considered absent if they do not attend practicum activities without permission from the assistant, and a deduction of 20 points will be applied to the final report for the practicum activities being undertaken.
8. Students who make noise during the practicum activities will be excluded from the practicum activities and will be considered absent.
9. Students who sleep, use cell phones, eat, and do other activities that are not instructed by the assistant during practicum activities will be sanctioned in the form of a 10-point reduction in value according to the practicum activities being undertaken.
10. Students who are late in submitting individual assignments will be penalized in the form of a score reduction of 20 points from their individual assignment score.
11. During the working period of practicum, students ought to:
    a. Submit a practicum assignment for each module that has been through ACC (after check and correct) on time. If the assignment is submitted late, the pertinent students will be penalized by **one WARNING NOTE**.
    b. Conduct assistance until the practicum assignment is accepted with ACC.
12. Students who are caught plagiarizing will be sanctioned with **two WARNING NOTE**.
13. Students who get **one WARNING NOTE** will be subject to a reduction in the final report score by **10 points**, and multiples apply.
14. The highest decision is based on the result of assistants' deliberation along with the Modeling and Simulation Laboratory Staff.

C. ORGANIZATIONAL STRUCTURE

LECTURERS PERSONALIA

Ir. Khalida Syahputri, ST, MT.
Head of Laboratory

Ir. Mangara Mangapul Tambunan, M. Sc.
Laboratory Staff

Ir. Ivo Andika Hasugian, ST, MT.
Laboratory Staff

Prof. Dr. Ir. Humala Napitupulu, DEA
Laboratory Staff

Ir. Indah Rizkya Tarigan, ST, MT.
Laboratory Staff

DEMISIONER 2020

Jerry, S.T.
Demisioner

Gwyndolyn, S.T.
Demisioner

David Wijaya, S.T.
Demisioner

Alkent Chenio, S.T.
Demisioner

Luciana Dumasih Rimbun L., S.T.
Demisioner

Hanif Fadhilah, S.T.
Demisioner

Andika Sukma Ompusunggu, S.T.
Demisioner

Teguh Juang Sinaga, S.T.
Demisioner

TOP MANAGEMENT 2021

ASSISTANT 2022

Willsen Huang
Practicum Coordinator

Eka Maulidya
ISO Member

Syifani Sabila
IT Member

Gretha Irene
Library Member

Vieni Angelina Hanatio
Library Member

Abel Ageshwara Dhyra
IT Member

Fadhil Samosir
Facility & Equipment Member

Stephen Gerrard Pasaribu
Facility & Equipment Member

ASSISTANT 2023

D. PRACTICUM MATERIALS

1. Algorithm of Programming

This module includes the introduction of the programming concepts, how to understand and make algorithms logically, correctly, efficiently, and effectively so that the flowchart of the algorithm is made in the proper way as well.

2. Spreadsheet Data Analysis

This module includes the explanation of the features available in Microsoft Excel, how to understand formulas in Microsoft Excel, manage statistical functions, generate random numbers, and test patterns, and also in compiling databases, formulating formulas, duplicating formulas, understanding financial functions in Excel, and analyzing quantitative (financial) problems that exist effectively and efficiently.

3. Database Management

This module includes the knowledge of making relational databases, how to fill databases, compile modules, prepare information displays, and operate database systems.

4. Fundamentals of Java Programming

This module includes the introduction to the programming language and the explanation of the features (applications) available on programming using Java and oriented to the NetBeans IDE.

5. Python for Data Science

This module includes the knowledge of the use, language, and fundamentals of Python Programming and Python in Data Science.

E. ASSESSMENT OF PRACTICUM RESULTS

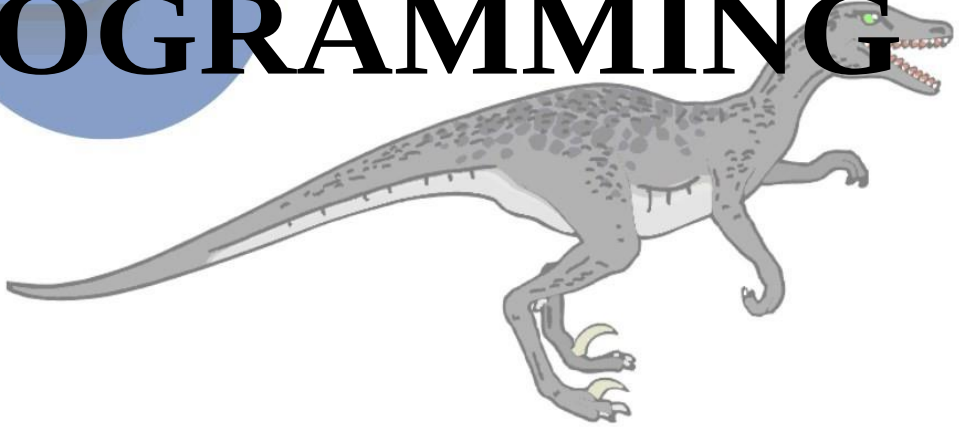
Assessment of practicum results is carried out starting from practical tests, task implementation, and Practicum assignment collection, with the division of assessment as follows:

1.	**VB Demonstration**		**= 25%**
2.	**Module**		**= 50%**
	a. Task	= 40%	
	b. Practicum Assignment	= 60% +	
	Subtotal	= 100%	
3.	**Practice**		**= 25%**
	a. Asisstance	= 50%	
	b. Attitude	= 50% +	
	Subtotal	= 100%	+
	Total		**= 100%**

All of the scores will be carried out by the Assistants of the Modeling and Simulation Laboratory. The final score band will be given based on the following range of scores:

1. Band A = 80 -100
2. Band B+ = 70 -79,99
3. Band B = 65 - 69,99
4. Band C+ = 60 - 64,99
5. Band C = 55 - 59,99
6. Band D = 45 - 54,99
7. Band E = 0 - 44,99

ALGORITHM OF PROGRAMMING



MODELING AND SIMULATION LABORATORY
INDUSTRIAL ENGINEERING STUDY PROGRAM
UNIVERSITAS SUMATERA UTARA

I. OBJECTIVES

1. Be able to understand concepts of algorithm and programming.
2. Be able to make a sequence of steps to solve the problem using the algorithm in the proper way.
3. Be able to understand the use of flowchart symbols and make flowcharts properly and correctly.

II. EQUIPMENTS

1. Laptop.
2. Microsoft Visio.
3. Raptor Software.
4. Badge name.
5. Practicum Module.
6. Stationery.
7. Literature & Tutorial about the pertinent program.

III. LITERATURE REVIEW

Definition of Program/Programming/Programming Language

1. Program is a problem-solving method provided in computers for human use to facilitate work or activities).
2. Programming is the process of implementing a sequence of steps to solve a problem using programming languages.
3. Programming Language is a language used to translate programming logic into instructions that can be understood by computers to then run (and in this case to make a program).

The Purposes of Structured Programming

1. Increase program reliability.
2. Increase program readability and exploration.
3. Increase program productivity.
4. Easier to maintain the program.
5. Simplify the complex program.

Algorithm

An algorithm is a technique of making a sequence of steps to solve the problem using the form of sentences with a limited number of words, but arranged logically and systematically.

The steps are outlined in writing. The first thing to emphasize is the way of completing a job. That is why algorithms of a job are possible to be divergent. Moreover, the second is the algorithm is written which may be in a sentence, image or table.

A good algorithm has the following characteristics:

1. Precise, correct, simple, standard dan effective.
2. Logic, structured and systematic.
3. All operations are defined.
4. All process must end after the steps are done.
5. Written in standard language with programming format so it is easy to implement and doesn't imply to double meaning.

Algorithm Criteria According to Donald E. Knuth:

1. Input : algorithm can define 0 (zero) or more inputs.
2. Output : algorithm must have at least one output.
3. Definiteness : algorithm has clear and unambiguous instructions.
4. Finiteness : algorithm must have a stop point (stopping role)
5. Effectiveness : algorithm must be arrange effectively (precise and efficient).

Type of Algorithm Process

1. Sequence Process : instructions are carried out sequentially.
2. Selection Process : instructions are defined with certain criteria.
3. Iteration Process : instructions are defined with certain condition.
4. Concurrent Process : several instructions are carried out at once.

Algorithm Examples

Algorithm in area of triangle calculation:

1. Start.
2. Input base value.
3. Input height value.
4. Calculate the area of triangle, L <– a*t/2
5. Define the value of area of triangle.
6. End.

Algorithm Implementation in Daily Activity

Algorithm in printing billing statement:

1. Start.
2. Turn on the laptop/computer.
3. Connect the laptop/computer to the internet.
4. Open the Google Chrome Application.
5. Type “Billing Statement USU”
6. Type your students’ identity number (NIM) on directed webpage.
7. Select “Lihat”.
8. Click “Print”.
9. End.

The Sequence of Steps in Programming

1. Identify the problem

   Identification of a problem is the most important thing for a programmer in determining the first step. According to Murphy’s law (by Henry Ledgard): “the faster the program is composed, the longer we can solve it”. That is why the problem needs to be identified, such as what can be solve by computer and also together with the input and output.

2. Find the solution

   After the problem is identified, the next step is to find the solution. If the problem is too complex, it is better to split the problem into smaller modules to make it easier to solve. With these used modules, the main program will be more concise.

3. Choose an algorithm

   Choose an algorithm that is efficient and fits the program.

4. Write the program

   Select a language that is easy to learn, easy to use and even better if it is mastered, has a high level of compatibilities with other hardware and platform.

5. Test the program

   After the program is built, test the program with all of the probabilities included in the error-handling so the program can run smoothly and perfectly.

6. Write the documentation

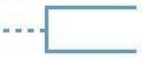
   Writing a documentation is really important because whenever any changes are made or source code is needed to be reread again, we can easily remember the pertinent part. We need to write comments about the codes or parameters used.

7. Maintain the program

   The finished program must be maintained periodically to prevent any bugs or improve new features.

Flowchart

Flowchart is a representation graphically from a sequence of steps of a program. The main purpose from flowchart uses is to depict the steps of a problem simply and clearly with standard symbols. A sequence of steps must be presented effectively and precisely.

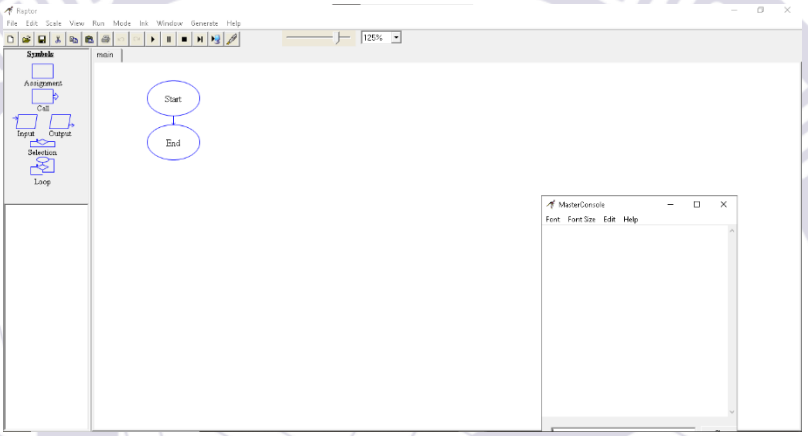
Symbol	Symbol Name	Description
	Flow lines	Flow lines are used to connect symbols used in flowchart and indicate direction of flow.
	Terminal (START / STOP)	This is used to represent start and end of the flowchart.
	Input / Output	It represents information which the system reads as input or sends as output.
	Processing	Any process is represented by this symbol. For example, arithmetic operation, data movement.
	Decision	This symbol is used to check any condition or take decision for which there are two answers. Yes (True) or No (False).
	Connector	It is used to connect or join flow lines.
	Off-page Connector	This symbol indicates the continuation of flowchart on the next page.
	Document	It represents a paper document produced during the flowchart process.
	Annotation	It is used to provide additional information about another flowchart symbol which may be in the form of descriptive comments, remarks or explanatory notes.
	Manual Input	It represents input to be given by a developer or programmer.
	Manual Operation	This symbol indicates that the process has to be done by a developer or programmer.
	Online Storage	It represents online data storage such as hard disks, magnetic drums or other storage devices.
	Offline Storage	It represents offline data storage such as sales on OCR, data on punched cards.
	Communication Link	It represents the data received or to be transmitted from an external system.
	Magnetic Disk	It represents data input or output from and to a magnetic disk.

Flowchart Symbols Image

Flowchart Software Programming

1. RAPTOR

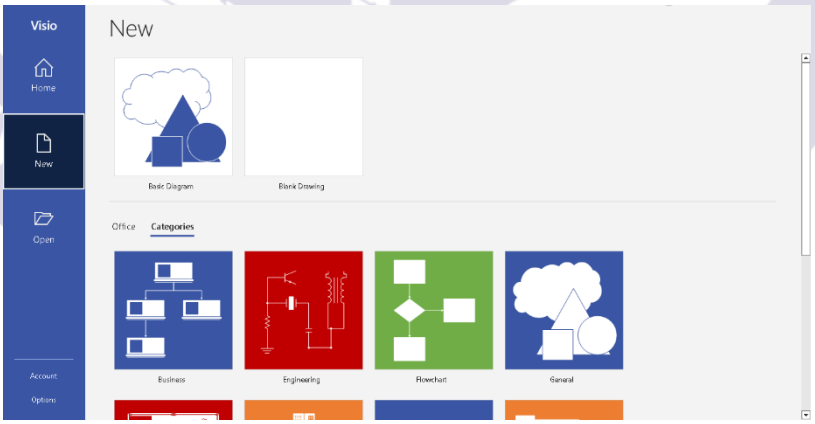
   Raptor is an open-source tool that fully supports object-oriented programming, including encapsulation, inheritance and polymorphism. Raptor enables to execute their algorithms within the environment, rather than having to separately compile and execute their programs. Raptor begins by opening a UML diagram, in which users can create classes, interfaces and enumeration types and specify relationships between the diagrams.



Raptor Software Image

2. Microsoft Visio

   Microsoft Visio is a computer application program released by Microsoft Corporation that often creates diagrams, flowcharts, brainstorming sessions, and network schematics. It uses vector graphics to create its diagrams.



Microsoft Visio Software Image

SPREADSHEET DATA ANALYSIS

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I. OBJECTIVES

1. Be able to understand the uses of functions in Excel to analyze the quantitative issues effectively and efficiently.
2. Be able to understand the uses of Pivot Table in analyzing data.

II. EQUIPMENTS

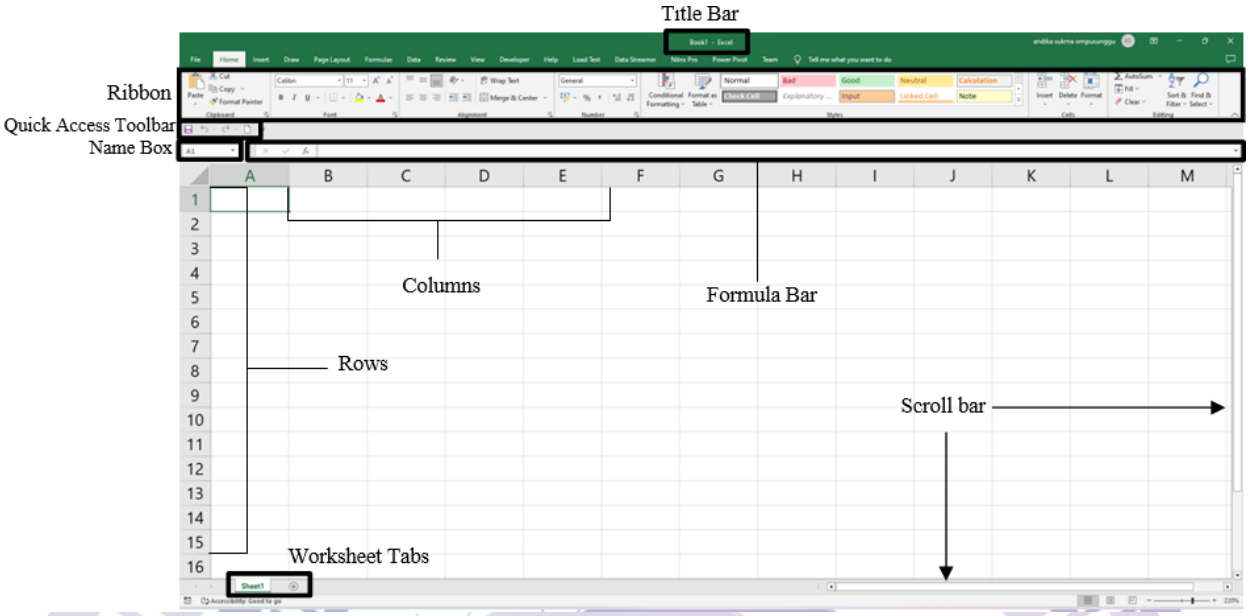
1. Laptop.
2. Microsoft Excel Program.
3. Badge name.
4. Practicum Module.
5. Stationery.
6. Literature & Tutorial about the pertinent program.
7. Cheatsheet.

III. LITERATURE REVIEW

Excel

Microsoft Excel is a software for processing automatically including basic calculations, usage functions, creating a chart and data management.

Excel allows to create a worksheet that is much like a ledger that can calculate automatically. Each Excel File is a ledger that can store a lot of worksheets. A worksheet consists of columns and rows, and consists of formula cells. In this cell the mathematical formulas can be used.



Microsoft Excel Worksheet Image

Description :

1. Office Button

   A button containing the basic functions of document management.

2. Quick Access Toolbar

   A shortcut keys of the existing function in the Office Toolbar.

3. Tab Ribbon

   Grouping of existing functions/commands in Microsoft Excel.

   Home : Contains a group of basic typing function keys and a table/base cell setting format

   Insert : Contains a group of function keys to insert something in the worksheet

   Page Layout : Contains a group of worksheet display setting buttons such as paper borders

   Formulas : Contains a group of formula buttons provided by Microsoft Excel

Data : Contains a group of buttons for data processing (related to databases)

Review : Contains a group of function keys to assess the contents of a document

View : Contains a group of function keys to manage the screen display of Microsoft Excel

4. Ribbon

   A group of function buttons in Microsoft Excel.

5. Title Bar

   Describe the document name description.

6. Formula Bar

   A box that describe the contents of an active cell (both data and formula).

7. Name Box

   A box describing the position of active cell, beginning of cell from cell/range block, and row count x column of cell block/range (if mouse button is not removed).

8. Column

   Describes the position of the column, consisting of alphabetical names of A-XFD as much as 16,384 columns.

9. Row

   Describe the position of the line, consisting of numbers from 1-1.048.576 rows.

10. Cell

    Position that edits the current text or data. If it consists of many cells called Range.

11. Worksheet

    Workplace where editing documents.

12. Scroll Bar

    The page slider button. This Scroll bar appears when the length/width of a page exceeds workspace.

13. Tab Worksheet

    Group of worksheet.

14. Insert Worksheet

    Shortcut key for new worksheet.

15. Zoom

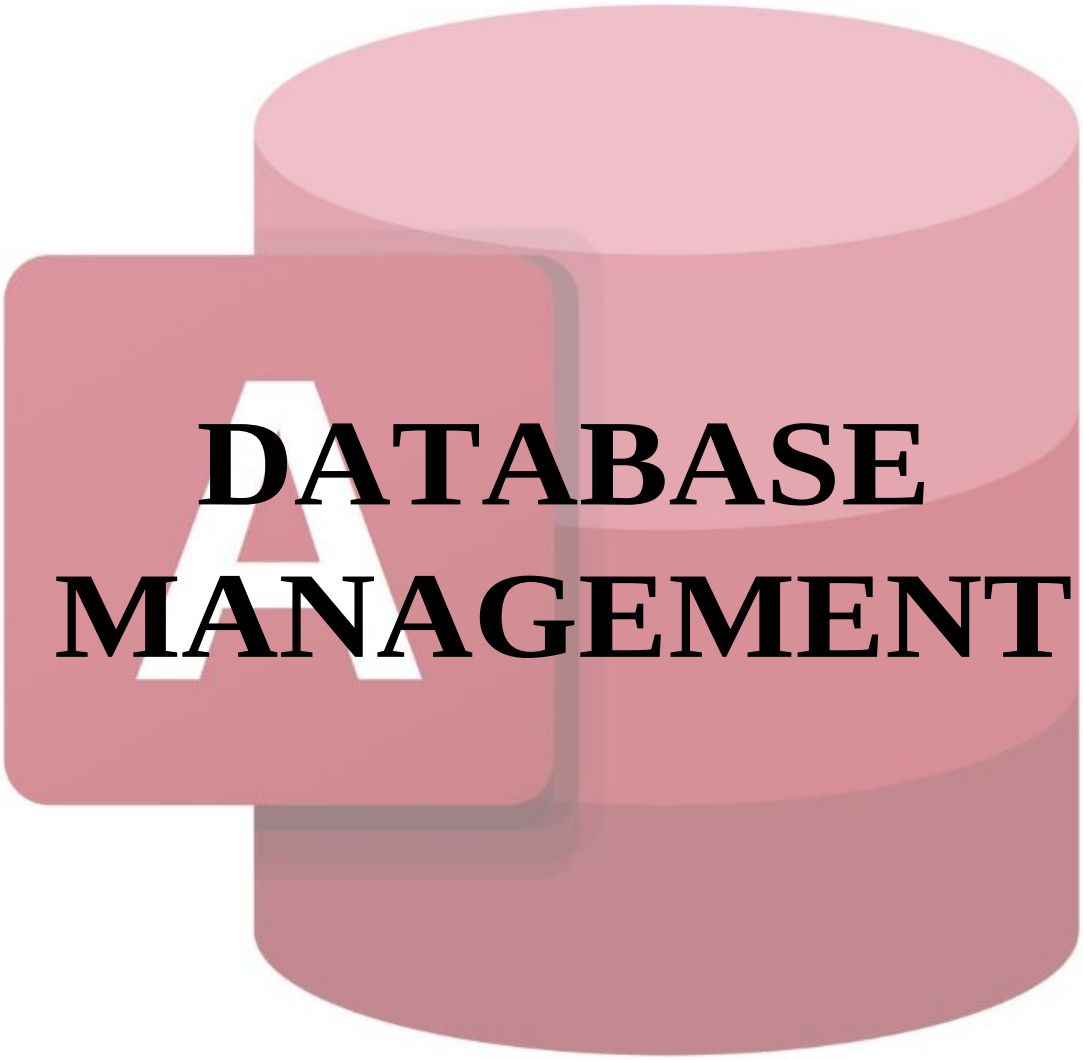
    Button used to control work view/display.

Pivot Table

Pivot Table is a table which displays data in more detail, is more interactive grouping data faster and easier, summarize large amounts of data, as well as perform various kinds of calculations quickly.

The benefit or the uses of Pivot Tables are creating data groupings based on categories as needed, make data summaries on various matters calculations, such as sum, average, and others, filter the data you want to display.

One of the advantages of Pivot Tables is that this feature is a data analysis feature easy to apply and easy to layout changed according to needs.



DATABASE MANAGEMENT

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INDUSTRIAL ENGINEERING STUDY PROGRAM
UNIVERSITAS SUMATERA UTARA

I. OBJECTIVES

1. Be able to compile the data according to the needs based on the expected criteria.
2. Be able to know and understand the use of database properly.
3. Be able to use Microsoft Access in database creation.

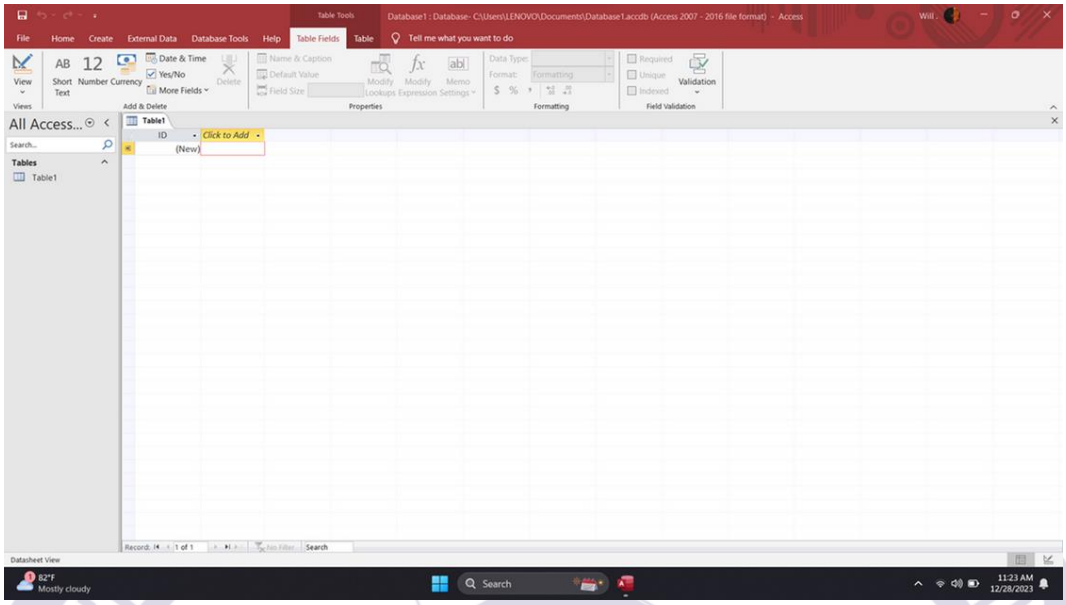
II. EQUIPMENTS

1. Laptop.
2. Microsoft Access Program.
3. Badge name.
4. Practicum Module.
5. Stationery.
6. Literature & Tutorial about the pertinent program.

III. LITERATURE REVIEW

Databases are a collection of data/information that is organized based on specific criteria that are interconnected. In computerization, database can be categorized very special because it has always been the main thing in designing the computer system of a company. A database can consist of a group of tables or a single table containing interconnected data. In Microsoft Access 2002, called One database is the same as a single file with an extension/ending MDB. For example Payroll. Mdb.

Microsoft Access is one of the most advanced database processing programs, used to process data types with easy operation. Many conveniences will be awarded if working with Microsoft Access. More over, it can perform sorting processes, managing data, labelling data and making daily activity report. For example, Microsoft Access can be used to accommodate customer lists, employee data logging and so on.



Microsoft Access Image

Outline:

1. Definition of Database
2. Data Model (Types)
3. Data Flow Diagram (DFD)
4. Entity Relationship Diagram (ERD)
5. Data Relation
6. Microsoft Access
7. Main Components of Microsoft Access

IV. PRACTICUM ASSIGNMENT FORMAT

BAB I PENDAHULUAN

- 1.1. Latar Belakang
- 1.2. Tujuan Praktikum
- 1.3. Landasan Teori

BAB II PENGUMPULAN DATA

- 2.1. Data *Microsoft Access*
- 2.2. Tampilan Aplikasi Awal

BAB III PENGOLAHAN DATA

- 3.1. Pembuatan Tabel

DAFTAR PUSTAKA

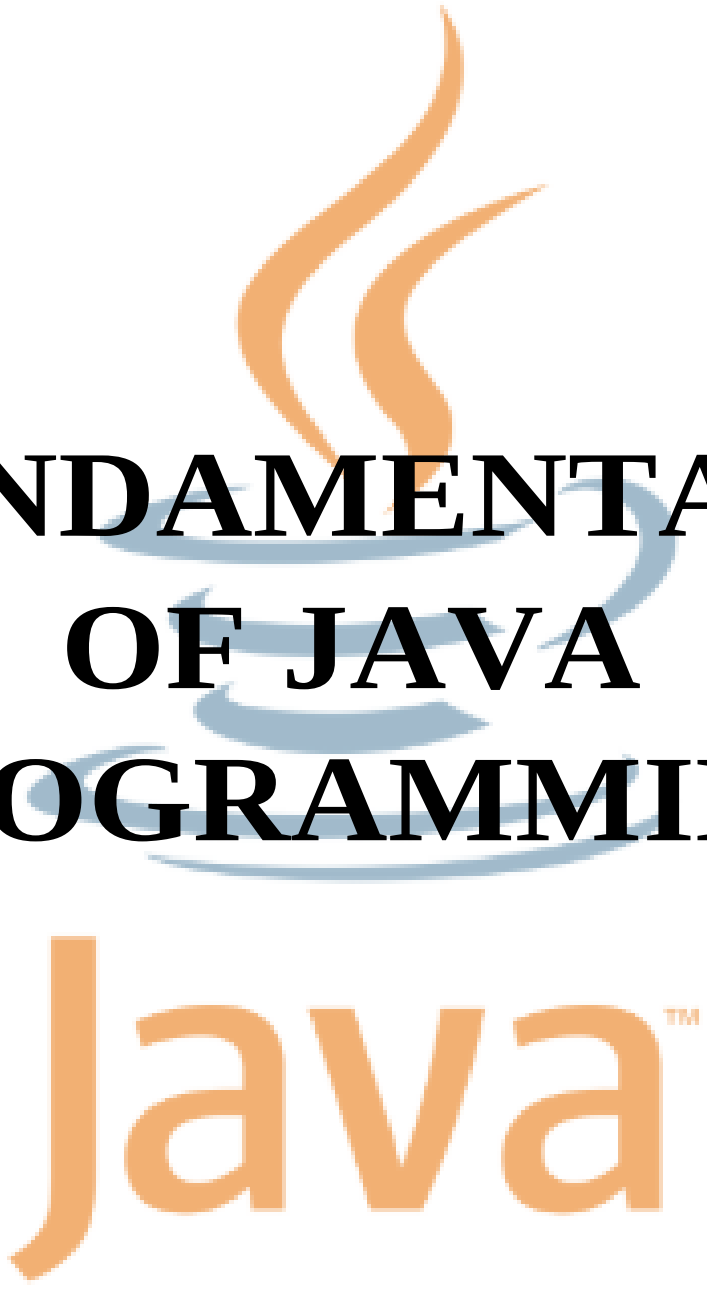
LAMPIRAN

Form Case

Form Pengumpulan Data

Form Asistensi

FUNDAMENTALS OF JAVA PROGRAMMING



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INDUSTRIAL ENGINEERING STUDY PROGRAM
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I. OBJECTIVES

1. Be able to know the use, language, and fundamentals of java programming.
2. Be able to model a program using Java.
3. Be able to know the uses of IDE NetBeans in creating java programs.

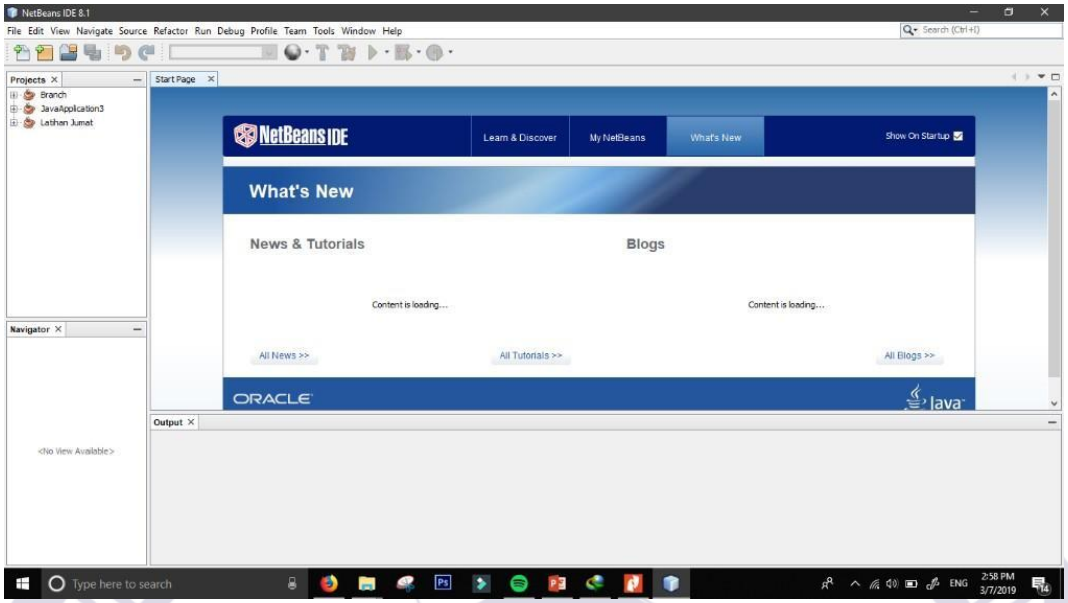
II. EQUIPMENTS

1. Laptop.
2. IDE NetBeans and Java Program Application.
3. Badge name.
4. Practicum Module.
5. Stationery.
6. Literature & Tutorial about the pertinent program.

III. LITERATURE REVIEW

Java is a programming language that can be run on various computers including mobile phones. The language was originally created by James Gosling while still joining Sun Microsystems is currently part of Oracle and released in 1995. It adopts syntactic in C and C++ but with simpler object model syntax as well as minimal lower-level routine support. Java-based applications are generally compiled into P-code (bytecode) and can be run on various Java Virtual machines (JVM). Java is a general-purpose programming language, and is specifically designed to make use of minimal implementation dependencies.

NetBeans is a Java based Integrated Development Environment (IDE) application from Sun Microsystems that runs over the swing. Swing is a Java technology for desktop application development that can run on a wide range of platforms such as Windows, Linux, Mac OS X and Solaris. An IDE is a programming scope that is integrated into a software application that provides a Graphic User Interface (GUI), a code editor or text, a compiler and a debugger.



NetBeans IDE Image

Outline:

1. Java Introduction
    a. Definition of Java
    b. History of Java
2. Object Oriented Programming and Java
    a. Objects and Classes
    b. Behaviour and Attributes
    c. Inheritance, Interfaces, and Packages
3. Fundamentals of Java
    a. Statements and Expressions
    b. Variable and Data Types
    c. Operators
    d. String Arithmetic
4. Arrays, Conditionals, and Loops
5. IDE NetBeans
6. Database MySQL
7. Example of Java Programming

IV. PRACTICUM ASSIGNMENT FORMAT

BAB I PENDAHULUAN

- 1.1. Latar Belakang
- 1.2. Tujuan Praktikum
- 1.3. Landasan Teori

BAB II PENGUMPULAN DATA

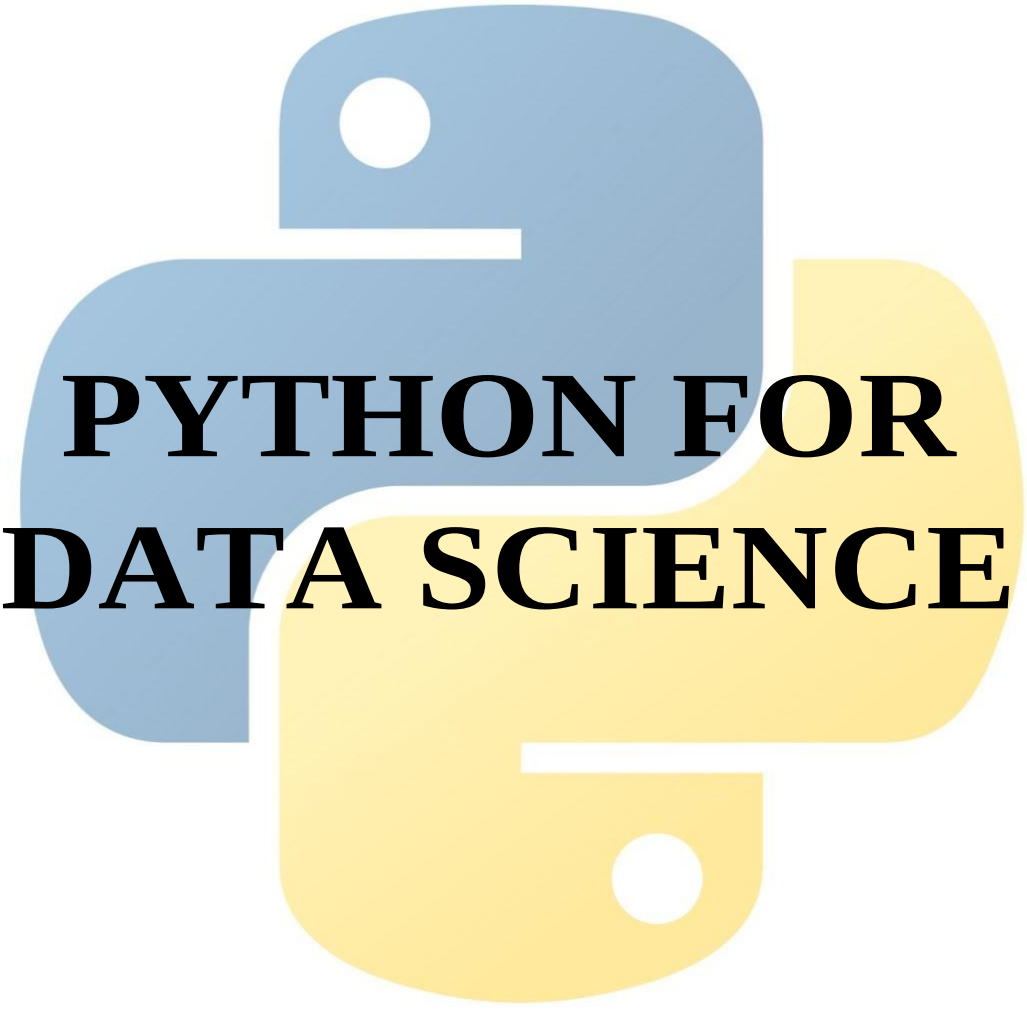
- 2.1. Permasalahan dan Formulasi Permasalahan
- 2.1.1. Permasalahan
- 2.1.2. Formulasi Permasalahan
- 2.2. *Flowchart* Pemecahan Masalah

BAB III PENGOLAHAN DATA

- 3.1. *Requirements*
- 3.2. Pembuatan *Command Line Interface* (CLI)
  - 3.2.1. Pembuatan *Project*
  - 3.2.2. Pembuatan *Package*
  - 3.2.3. Pembuatan *Class*
  - 3.2.4. Pembuatan *Database*
  - 3.2.5. Penulisan Kode Program *Command Line Interface* (CLI)
  - 3.2.6. Hasil Penulisan
- 3.3. Pembuatan *Graphical User Interface* (GUI)
  - 3.3.1. Tahapan Pembuatan *Form*
  - 3.3.2. *Interface* Program *Form*
  - 3.3.3. Penulisan Kode Program *Graphical User Interface* (GUI)
- 3.4. Perubahan Nilai *Properties Object*
- 3.5. Tampilan Akhir Program

BAB IV ANALISIS DAN EVALUASI

- 4.1. Analisis
  - 4.1.1. Analisis Pembuatan *Command Line Interface* (CLI)
  - 4.1.2. Analisis Pembuatan *Graphical User Interface* (GUI)
  - 4.1.3. Analisis Pembuatan *Form*



PYTHON FOR DATA SCIENCE

MODELING AND SIMULATION LABORATORY
INDUSTRIAL ENGINEERING STUDY PROGRAM
UNIVERSITAS SUMATERA UTARA

I. OBJECTIVE

1. Be able to know the use, language, and fundamental of Python Programming.
2. Be able to know the concept of Data Science.
3. Be able to know the uses of Python in Data Science.

II. EQUIPMENTS

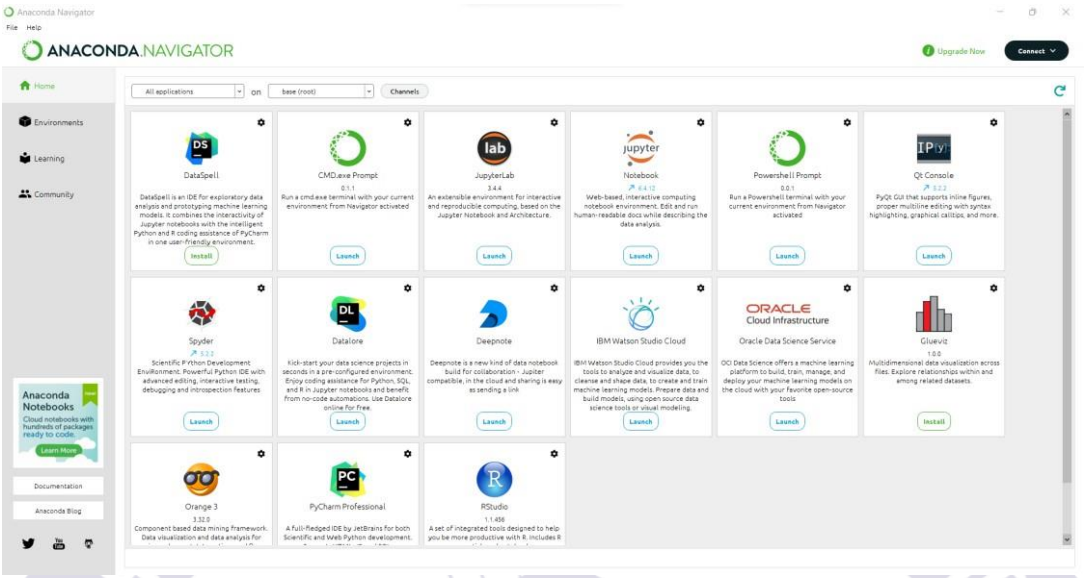
1. Laptop.
2. Jupyter Notebook.
3. Badge name.
4. Practicum Module.
5. Stationery.
6. Literature & Tutorial about the pertinent program.

III. LITERATURE REVIEW

Python is a popular and comprehensive high-level object-oriented programming language that combines capabilities, and clear code syntax and is equipped with a standard library that has enormous functionality. Python is one of the high-level programming languages such as C, C++, Java, Visual Basic, Perl, and Pascal programming languages.

Python was created by a person named Guido van Rossum in 1990 in the Netherlands to be precise at the Centrum Wiskunde and Informatica (CWI). Python is an advanced project of the ABC-type programming language. The first version of the Python programming language which was released in February 1991 was version 0.9.0.

Python can be installed on various platforms such as Windows, macOS and Linux operating systems. But in its use Python requires a lot of libraries to process data and requires prior arrangement before it can be used. To overcome this, you can use the Anaconda application, by installing Python on Anaconda, the libraries needed in Python will be installed automatically.



Anaconda Navigator view

Outline:

1. Definition of Python
2. History of Python
3. Library Python
    a. Pandas
    b. Numpy
    c. Seaborn
    d. Matplotlib
        1) Heatmap
        2) Line Chart
        3) Bar Chart
        4) Pie Chart
        5) Scatter Plot
    e. Scikit Learn
4. Data Science
    a. Definition of Data Science
    b. Development of Data Science
    c. OSEMN (Obtain, Scrub, Explore, Model, Interpret)

IV. PRACTICUM ASSIGNMENT FORMAT

BAB I PENDAHULUAN

- 1.1. Latar Belakang
- 1.2. Tujuan Praktikum
- 1.3. Landasan Teori

BAB II PENGUMPULAN DATA

- 2.1. Data Awal (Judul *Dataset*)
- 2.2. Formulasi Permasalahan Data Awal

BAB III PENGOLAHAN DATA

- 3.1. *Import* Data
- 3.2. *Import Library*
- 3.3. *Data Cleansing* dan *Exploratory Data Analysis*
- 3.4. Data *Visualization*
  - 3.4.1. *Heatmap*
  - 3.4.2. *Line Chart*
  - 3.4.3. *Bar Chart*
  - 3.4.4. *Pie Chart*
  - 3.4.5. *Scatter Plot*
- 3.5. *Linear Regression*

BAB IV ANALISIS DAN EVALUASI

- 4.1. Analisis
  - 4.1.1. Analisis *Dataset* Awal
  - 4.1.2. Analisis *Data Cleansing* dan *Exploratory Data Analysis*
  - 4.1.3. Analisis *Data Visualization*
  - 4.1.4. Analisis *Linear Regression*
- 4.2. Evaluasi
  - 4.2.1. Evaluasi *Dataset* Awal
  - 4.2.2. Evaluasi Analisis *Data Cleansing* dan *Exploratory Data Analysis*

ATTACHMENTS

LAPORAN PRAKTIKUM
MATA KULIAH PEMROGRAMAN KOMPUTER

Oleh

KELOMPOK X / GELOMBANG X

1.	AAAAAAAAAA	240403000
2.	BBBBBBBBBBB	240403000
3.	CCCCCCCCCC	240403000
4.	DDDDDDDDDD	240403000
5.	EEEEEEEEEEE	240403000

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MEDAN
2025

Laporan Praktikum

Mata Kuliah Pemrograman Komputer

LEMBAR PENGESAHAN

PRAKTIKUM MATA KULIAH PEMROGRAMAN KOMPUTER

Oleh

K E L O M P O K X / G E L O M B A N G X

1.	**AAAAAAAAAA**	**240403000**
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4.	**DDDDDDDDDD**	**240403000**
5.	**EEEEEEEEEEE**	**240403000**

Disetujui Oleh

Kepala Laboratorium

Pemodelan dan Simulasi

(Ir. Khalida Syahputri, S.T., M.T.)

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Laporan Praktikum

Mata Kuliah Pemrograman Komputer

MODUL X

XXXXXXXXXXXXXXXXXXXXX

Oleh

KELOMPOK X / GELOMBANG X

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4.	**DDDDDDDDDD**	**240403000**
5.	**EEEEEEEEEE**	**240403000**

LABORATORIUM PEMODELAN DAN SIMULASI

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Laporan Praktikum

Mata Kuliah Pemrograman Komputer

MODUL X

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Oleh

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3.	**CCCCCCCCCC**	**240403000**
4.	**DDDDDDDDDD**	**240403000**
5.	**EEEEEEEEEEE**	**240403000**

Disetujui Oleh

Asisten 2021	**Asisten 2022/2023**
Laboratorium Pemodelan dan Simulasi	**Laboratorium Pemodelan dan Simulasi**
(AAAAAAAAAAAAA)	**(AAAAAAAAAAAAA)**

L A B O R A T O R I U M P E M O D E L A N D A N S I M U L A S I

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2 0 2 5

	***FORM* ASISTENSI**
	LABORATORIUM PEMODELAN DAN SIMULASI
PROG. STUDI : Reguler (S1)	**MODUL : *Database Management***
KEL/GEL : I/A	**ASISTEN : Asisten 2021 Asisten 2022/2023**

NO.	TANGGAL	NIM	NAMA	KETERANGAN	T. TANGAN
1.		xx0403xxx	AAAAA		
		xx0403xxx	BBBBB		
		xx0403xxx	CCCCC		
		xx0403xxx	DDDDD		
		xx0403xxx	EEEEE		
2.		xx0403xxx	AAAAA		
		xx0403xxx	BBBBB		
		xx0403xxx	CCCCC		
		xx0403xxx	DDDDD		
		xx0403xxx	EEEEE		
3.		xx0403xxx	AAAAA		
		xx0403xxx	BBBBB		
		xx0403xxx	CCCCC		
		xx0403xxx	DDDDD		
		xx0403xxx	EEEEE		
4.		xx0403xxx	AAAAA		
		xx0403xxx	BBBBB		
		xx0403xxx	CCCCC		
		xx0403xxx	DDDDD		
		xx0403xxx	EEEEE		
5.		xx0403xxx	AAAAA		
		xx0403xxx	BBBBB		
		xx0403xxx	CCCCC		
		xx0403xxx	DDDDD		
		xx0403xxx	EEEEE		
6.		xx0403xxx	AAAAA		
		xx0403xxx	BBBBB		
		xx0403xxx	CCCCC		
		xx0403xxx	DDDDD		
		xx0403xxx	EEEEE		
7.		xx0403xxx	AAAAA		
		xx0403xxx	BBBBB		
		xx0403xxx	CCCCC		
		xx0403xxx	DDDDD		
		xx0403xxx	EEEEE		
8.		xx0403xxx	AAAAA		
		xx0403xxx	BBBBB		
		xx0403xxx	CCCCC		
		xx0403xxx	DDDDD		
		xx0403xxx	EEEEE		

FORM CASE DATABASE MANAGEMENT

Kelompok **: IA**

Anggota **: - Aaaa (240403xxx)**

- Bbbb (240403xxx)

- Cccc (240403xxx)

- Dddd (240403xxx)

Tema **: Penjualan**

Topik Permasalahan **: *Database* Toko *Furniture* LPS**

1. Rancangan Tabel

Berikut merupakan rancangan tabel daftar barang pada toko *furniture* LPS.

a. Tabel Daftar Barang

Sebuah tabel yang merupakan tempat untuk menampung *database* mengenai daftar barang.

Tabel 1. Tabel Daftar Barang

Kode Barang	Nama Barang	Harga Produk

Sumber: Pengumpulan Data

b. Tabel Daftar Pelanggan

Sebuah tabel yang merupakan tempat untuk menampung *database* mengenai daftar pelanggan.

Tabel 2. Tabel Daftar Pelanggan

ID	Nama	Jenis Kelamin	Alamat	No HP

Sumber: Pengumpulan Data

c. Tabel Daftar Pembelian

Sebuah tabel yang merupakan tempat untuk menampung *database* mengenai daftar pembelian.

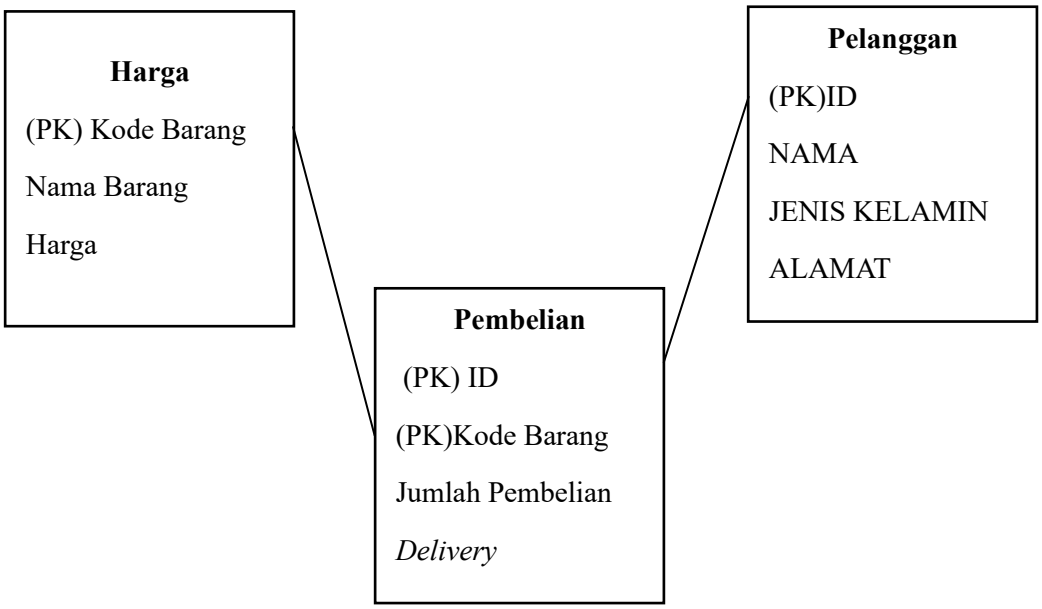
Tabel 3. Tabel Daftar Pembelian

ID	Kode Barang	Jumlah Pembelian	*Delivery*

Sumber: Pengumpulan Data

2. Rancangan *Relationship*

Berikut merupakan rancangan *relationship* pada toko *furniture* LPS.



Gambar 1. *Relationship*

Sumber: Microsoft Visio 2019

3. Rancangan *Expression Builder*

Berikut merupakan rancangan *expression builder* pada toko *furniture* LPS.

a. Harga sebelum diskon

Harga sebelum diskon :([Harga]*[Jumlah Pembelian])

b. Diskon

   Diskon: IIf([Jumlah Pembelian]>=8;"Yes";"No")

c. Harga setelah diskon

   Harga Setelah Diskon: IIf([Jumlah Pembelian]>=8;[Harga Sebelum Diskon]*0,9;[Harga Sebelum Diskon])

d. Harga Total

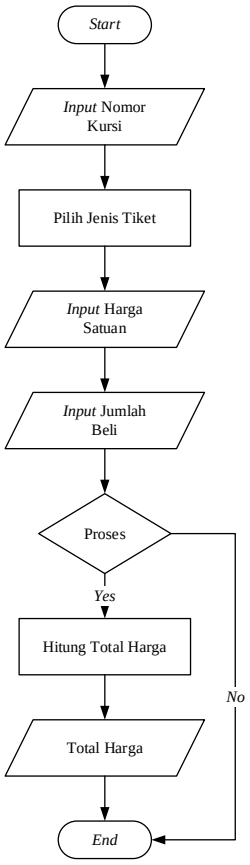
   Harga Total: IIf([Delivery]=Yes;([Harga Setelah Diskon]+50000);([Harga Setelah Diskon]))

FORM CASE FUNDAMENTALS OF JAVA PROGRAMMING

Kelompok	**:**	**IA**	
Anggota	**:**	**- Aaaaa**	**(240403XXX)**
		- Bbbbb	**(240403XXX)**
		- Ccccc	**(240403XXX)**
		- Ddddd	**(240403XXX)**
Tema	**:**	**Penjualan**	
Topik/Permasalahan	**:**	**Penjualan Tiket Bioskop**	

1. *Flowchart* Pemecahan Masalah

Flowchart pemecahan masalah pada kasus di atas adalah sebagai berikut.



Sumber: Microsoft Visio 2013

Gambar 1. *Flowchart* Pemecahan Masalah

2. Rancangan *Interface Program*

Rancangan *interface program* yang dibuat pada IDE *NetBeans* 12.1 dapat dilihat sebagai berikut:

a. *Form* Pemesanan Tiket Bioskop

Sebuah *form* yang merupakan halaman utama program. *Interface form* pemesanan tiket bioskop dapat dilihat pada Gambar 2.

Sumber: IDE NetBeans 12.1

Gambar 2. *Interface Form* Pemesanan Tiket Bioskop

Keterangan isian pada tampilan *interface form* pemesanan tiket bioskop dapat dilihat pada Tabel 1.

Tabel 1. Keterangan Pemesanan Tiket Bioskop

***Form* Pemesanan Tiket Bioskop**	**Kolom**
No. Kursi	(Dikosongkan)
Jenis Tiket	Reguler Ultra XD Ultra Gold
Harga Satuan	(Dikosongkan)
Jumlah beli	(Dikosongkan)
Total harga	(Dikosongkan)

Sumber: Pengumpulan Data

FORM CASE PYTHON FOR DATA SCIENCE

Kelompok	**: IA**	
Anggota	**: - Aaaaa**	**(240403xxx)**
	- Bbbbb	**(240403xxx)**
	- Ccccc	**(240403xxx)**
	- Ddddd	**(240403xxx)**
Judul *Dataset*	**: *Online Retail***	

1. Informasi *Dataset*

Data *Online Retail* adalah data dari penjualan sebuah toko kado yang menyediakan berbagai macam barang yang biasa diberikan kepada orang lain dalam bentuk hadiah atau kado. Informasi *dataset Online Retail* dapat dilihat pada Tabel 1.

Tabel 1. Informasi *Dataset Online Retail*

Index	*Column*	*Non-Null Count*	*Dtype*

Sumber: Pengumpulan Data

Informasi jumlah data kosong pada *dataset Online Retail* dapat dilihat pada Tabel 2.

Tabel 2. Informasi Jumlah Data Kosong pada *Dataset Online Retail*

Column	Jumlah Data

Sumber: Pengumpulan Data

2. Isi *Dataset*

Isi dari *dataset Online Retail* dapat dilihat pada Tabel 3.

Tabel 3. Isi *Dataset Online Retail*

Index	*Invoice*	*StockCode*	*Description*	*Quantity*	*InvoiceDate*	*Price*	*CustomerID*	*Country*

Sumber: Pengumpulan Data

3. Formulasi Permasalahan Data

Pada *dataset Online Retail* ditentukan beberapa sub komponen yang akan dijadikan sebagai variabel X dan variabel Y untuk dianalisis menggunakan diagram. Adapun sub komponen yang menjadi variabel X dan Y pada *dataset* ini dapat dilihat pada Tabel 4.

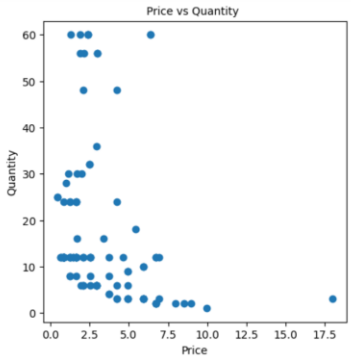
Tabel 4. Formulasi Permasalahan Data

No	Variabel X	Variabel Y	*Chart*	Keterangan
1			*Line Chart*	
2			*Bar Chart*	
3			*Pie Chart*	
4			*Scatter Plot*	

Sumber: Pengumpulan Data

4. *Scatter Plot*

Scatter plot dari *Price* dan *Quantity* untuk menentukan hubungan antara harga dan jumlah produk terjual dapat dilihat pada Gambar 1.



Sumber: Jupyter Notebook

Gambar 1. *Scatter Plot* Price vs Quantity

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