Soal Praktikum *Practicum Case* COMP6362 Data Structures	BINUS UNIVERSITY
Teknik Informatika *Computer Science*	**CS-COMP6362-Var03.3**
Periode Berlaku Mulai Semester Genap 2020/2021 ***Valid on*** *Even Semester Year* 2020/2021	**Revisi 00** *Revision 00*

Learning Outcomes
- Demonstrate how to create any learned data structure
- Analyze the usage of data structure in application

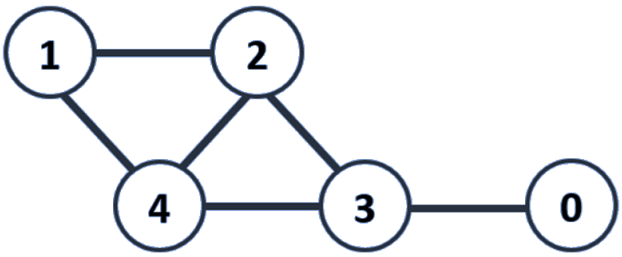
Topic
- Session 10 - Graph

Sub Topics
- Representation of graph
- Graph Traversal

Soal
Case

Make a program that ilustrates **the following Graph**. The requirements will be described below.

- Program consists of 6 menus:
  1. Show Adjacency Matrix
  2. Show Adjacency List
  3. Show Degree of all vertices
  4. Show BFS Traversal from vertex 0
  5. Show DFS Traversal from vertex 0
  6. Exit



- If user chooses **Show Adjacency Matrix**, then:
  show the graph representation in Adjacency Matrix form.
- If user chooses **Show Adjacency List**, then:
  show the graph representation in Adjacency List form.
- If user chooses **Show Degree of all vertices**, then:
  show the in degree, out degree, and total degree of all vertices.
- *If user chooses **Show BFS Traversal from vertex 0**, then:*
  show the result of Show BFS Traversal from vertex 0.
- *If user chooses **Show DFS Traversal from vertex 0**, then:*
  show the result of Show DFS Traversal from vertex 0.
- If user chooses **Exit,** then:
  Program ends.

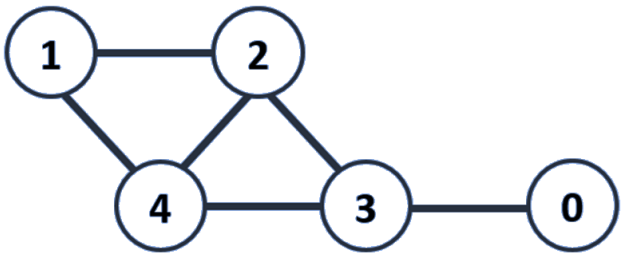
NB:
Menu 4 and 5 is not compulsory.
They are **challenge**.

Print screen of main menu

```
Graph Representation and Traversal
==================================

        1   -  2
          \   / \
            4  -  3  -  0


1. Show Adjacency Matrix
2. Show Adjacency List
3. Show Degree of all vertices
4. Show BFS Traversal from vertex 0
5. Show DFS Traversal from vertex 0
6. Exit

>> Input choice:
```

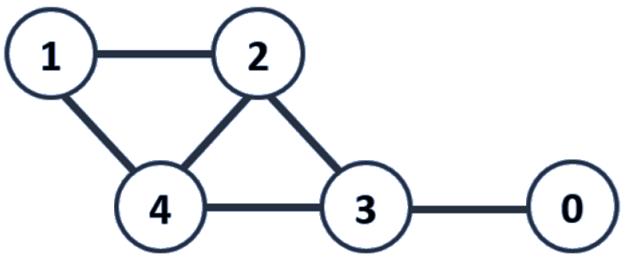
Print screen of Show Adjacency Matrix (Menu '1')

```
>> Input choice: 1

   Adjacency Matrix of this Graph
   ------------------------------

   Vertex    0  1  2  3  4

        0    0  0  0  1  0
        1    0  0  1  0  1
        2    0  1  0  1  1
        3    1  0  1  0  1
        4    0  1  1  1  0
```



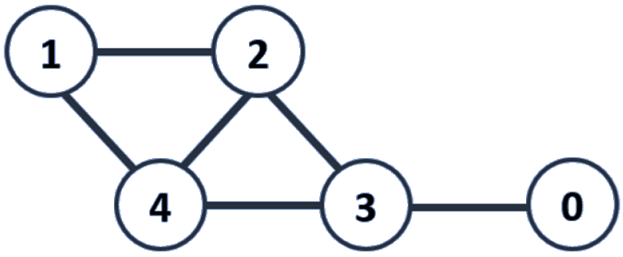
Print screen of Show Adjacency List (Menu '2')

```
>> Input choice: 2

   Adjacency List of this Graph
   ----------------------------

   Vertex 0 :  3 ->  NULL
   Vertex 1 :  2 ->  4 ->  NULL
   Vertex 2 :  1 ->  3 ->  4 ->  NULL
   Vertex 3 :  0 ->  2 ->  4 ->  NULL
   Vertex 4 :  1 ->  2 ->  3 ->  NULL
```



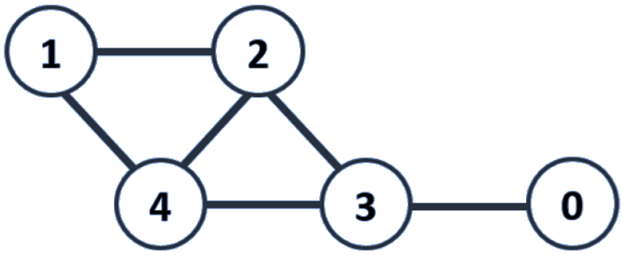
Print screen of Show Degree of all vertices (Menu '3')

```
>> Input choice: 3

   Degree of all vertices
   ----------------------

   Degree of vertex 0 : 1
   Degree of vertex 1 : 2
   Degree of vertex 2 : 3
   Degree of vertex 3 : 3
   Degree of vertex 4 : 3
```



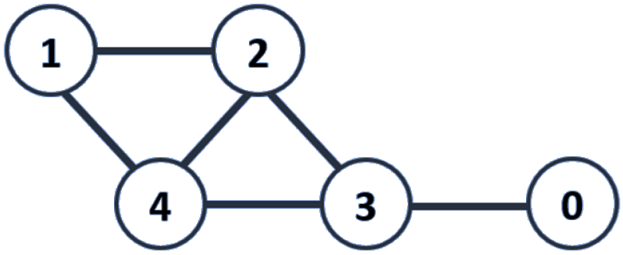
Print screen of *Show BFS Traversal from vertex 0* (Menu '4')

```
>> Input choice: 4

   BFS Traversal
   -------------

   Queue contains 0
                        Visited 0

   Queue contains 3
                        Visited 3

   Queue contains 2 4
                        Visited 2

   Queue contains 4 1
                        Visited 4

   Queue contains 1
                        Visited 1
```



Print screen of *Show DFS Traversal from vertex 0* (Menu '5')

```
>> Input choice: 5

   DFS Traversal
   -------------

   Visited 0
   Visited 3
   Visited 4
   Visited 1
   Visited 2
```



NB:
If menu 1, 2, 3, and 6 are done, then you may get **max**. 70.
If you explain them (menu 1, 2, 3, 6) in a presentation, then you may get **max**. +10.
If menu 4 is done and you explain it in a presentation, then you may get **max**. +10.
If menu 5 is done and you explain it in a presentation, then you may get **max**. +10.