Republic of the Philippines
CAVITE STATE UNIVERSITY
Don Severino delas Alas Campus
Indang, Cavite

DATA STRUCTURES AND ALGORITHM

Exercises in

GRAPHS

Score

Submitted by:
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Monday-Thursday/10:00-1:00 / BSCPE 2-2

Date Submitted
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Submitted to:

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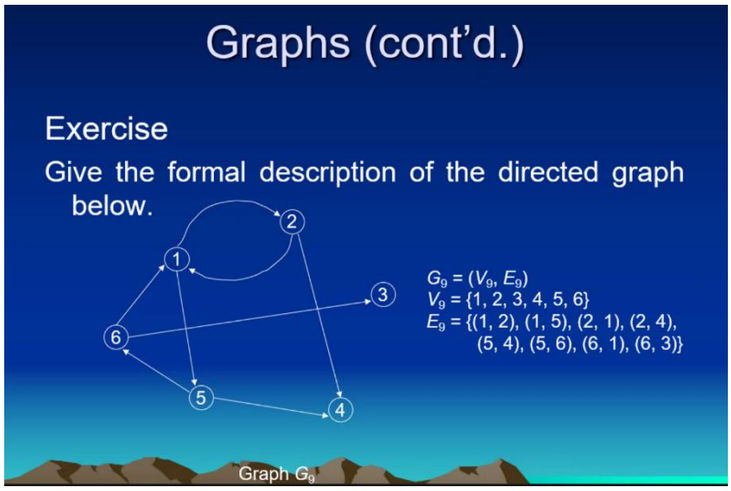


Formal Description:

$G_9 = \{V_9, E_9\}$

$V_9 = \{1,2,3,4,5,6\}$

$E_9 = \{(1, 2), (2, 1), (1, 5), (2, 4), (5, 4), (5, 6), (6, 1), (6, 3)\}$

PATHS

Paths with length of 2:

V = {(1, 2, 4), (1, 2, 1), (1 5, 6), (2, 1, 2), (5, 6, 1), (5, 6, 3), (6, 1, 2), (6, 1, 5)}

Paths with length of 3:

V = {(1,5,6,1), (1,5,6,3), (2,1,5,6), (2,1,5,4), (6,1,5,6), (6,1,2,4), (5,6,1,2), (5,6,1,5), (6,1,5,4)}

Path with length of 4:

V = {(2,1,5,6,3), (5,6,1,2,4)}

SIMPLE PATHS

Simple paths with length of 2:

V = {(1,2,4), (1,5,6), (1,5,4), (5,6,1), (5,6,3), (6,1,2), (6,1,5)}

Simple paths with length of 3:

V = {(1,5,6,3), (2,1,5,4), (2,1,5,6), (5,6,1,2), (6,1,5,4), (6,1,2,4)}

Simple paths with length of 4:

V = {(2,1,5,6,3), (5,6,1,2,4)}

SIMPLE CYCLE

Simple cycle with length of 2:

V = {(1,2,1), (2,1,2)}

Simple cycle with length of 3:

V = {(1,5,6,1), (5,6,1,5), (6,1,5,6)}

INDEGREE

node 1: V = {2, 6}
node 2: V = 1
node 3: V = 6
node 4: V = {2, 5}
node 5: V = 1
node 6: V = 5

OUTDEGREE

node 1: V = {2, 5}
node 2: V = {1, 4}
node 3: V = null
node 4: V = null
node 5: V = {4, 6}
node 6: V = {1, 3}

VERTICES ADJACENT TO THE NODES

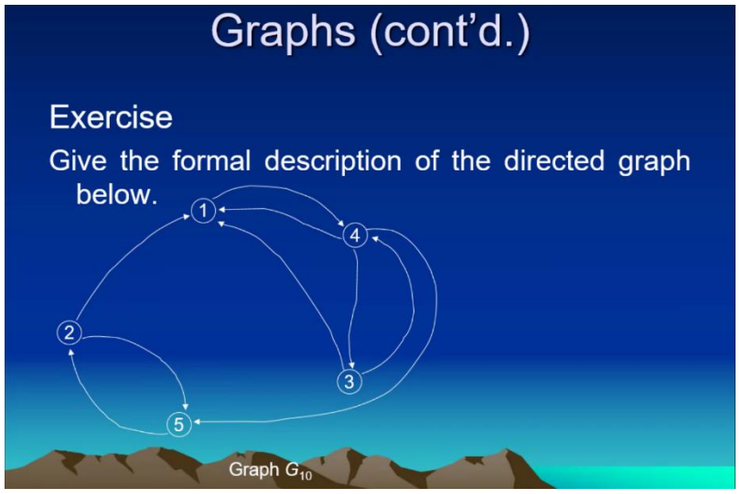
node 1: V = {2, 6}
node 2: V = 1
node 3: V = 6
node 4: V = {2, 5}
node 5: V = 1
node 6: V = 5

VERTICES ADJACENT FROM THE NODES

node 1: V = {2, 5}
node 2: V = {1, 4}
node 3: V = null
node 4: V = null
node 5: V = {4, 6}
node 6: V = {1, 3}

EDGES INCIDENT TO THE NODES

node 1: E = {(1,2), (2,1), (1,5), (6,1)}
node 2: E = {(2,1), (1,2), (2,4)}
node 3: E = {6, 3}
node 4: E = {(2,4), (5,4)}
node 5: E = {(1,5), (5,6), (5,4)}
node 6: E = {(6,1), (6,3), (5,6)}



Formal Description:

$G_{10} = \{V_{10}, E_{10}\}$

$V_{10} = \{1, 2, 3, 4, 5\}$

$E_{10} = \{(1, 4), (2, 1), (2, 5), (3, 1), (3, 4), (4, 1), (4, 3), (4, 5), (5, 2)\}$

PATHS

Paths with length of 2:

V = {(1,4,3), (1,4,1), (1,4,5), (2,1,4), (2,5,2), (3,1,4), (3,4,3), (3,4,1), (3,4,5), (4,1,4), (4,3,1), (4,3,4), (4,5,2), (5,2,5), (5,2,1)}

Paths with length of 3:

V = {(1,4,3,1), (1,4,5,2), (2,1,4,3), (2,1,4,5), (3,4,5,2), (3,1,4,3), (3,1,4,5), (4,3,1,4), (4,5,2,1), (5,2,1,4)}

Path with length of 4:

V = {(1,4,5,2,1), (2,1,4,5,2,), (3,1,4,5,2), (3,4,5,2,1), (4,5,2,1,4), (5,2,1,4,3), (5,2,1,4,5)}

SIMPLE PATHS

Simple paths with length of 2:

V = {(1,4,3), (1,4,5), (2,1,4), (3,1,4), (3,4,1), (3,4,5), (4,3,1), (4,5,2), (5,2,1)}

Simple paths with length of 3:

V = {(1,4,5,2), (2,1,4,3), (2,1,4,5), (3,4,5,2), (3,1,4,5), (4,5,2,1), (5,2,1,4)}

Simple paths with length of 4:

V = {(3,1,4,5,2), (3,4,5,2,1), (5,2,1,4,5)}

SIMPLE CYCLE

Simple cycle with length of 2:

V = {(1,4,1), (2,5,2) ,(3,4,3), (4,1,4), (4,3,4), (5,2,5)}

Simple cycle with length of 3:

V = {(1,4,3,1), (3,1,4,3), (4,3,1,4)}

Simple cycle with length of 4:

V= {(1,4,5,2,1), (2,1,4,5,2), (4,5,2,1,4), (5,2,1,4,5)}

INDEGREE

node 1: V = {2, 3, 4}
node 2: V = 5
node 3: V = 4
node 4: V = {1, 3}
node 5: V = {2, 4}

OUTDEGREE

node 1: V = 4
node 2: V = {1, 5}
node 3: V = {1, 4}
node 4: V = {1, 3, 5}
node 5: V = 2

VERTICES ADJACENT TO THE NODES

node 1: V = {2, 3, 4}
node 2: V = 5
node 3: V = 4
node 4: V = {1, 3}
node 5: V = {2, 4}

VERTICES ADJACENT FROM THE NODES

node 1: V = 4
node 2: V = {1, 5}
node 3: V = {1, 4}
node 4: V = {1, 3, 5}
node 5: V = 2

EDGES INCIDENT TO THE NODES

node 1: E = {(1,4), (2,1), (3,1), (4,1)}
node 2: E = {(2,1), (2,5), (5,2)}
node 3: E = {(3,1), (3,4), (4,3)}
node 4: E = {(4,1), (4,3), (4,5), (1,4), (3,4)}
node 5: E = {(5,2), (2,5), (4,5)}