IBS-3

Assignment-1

1. Use the di-graph assigned to you already for the previous assignment. Code the following in the assigned language

   1.1 Create an adjacency matrix corresponding to that di-graph
   1.2 Calculate the in-degree for each node from the matrix and display the value
   1.3 Calculate the out-degree for each node from the matrix and display the value
   1.4 Create the degree matrix (diagonal in nature) and display it

Due date: 14/08/2020

Answer:

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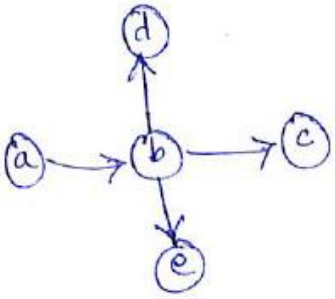
THE DIGRAPH:



THE CODE USED FOR COMPUTATION (IN JULIA):

```
using LinearAlgebra

function find_degree(A)

    #Retrieve size of matrix

    s = size(A);

    #Indegree of a node is sum of the elements present in node's column of the Adjacency Matrix

    indegree = [sum(A[:,i]) for i in 1:s[2]];

    #Outdegree of a node is sum of the elements present in node's row of the Adjacency Matrix

    outdegree = [sum(A[i,:]) for i in 1:s[1]];

    #Degree of node is sum of its indegree and outdegree

    degree = indegree .+ outdegree;

    #Degree Matrix is a diagonal matrix

    degree_Mat = Diagonal(degree);

    return indegree, outdegree, degree, degree_Mat

end
```

```
# 1.1

Adj_Mat = [0 1 0 0 0;0 0 1 1 1;0 0 0 0 0;0 0 0 0 0;0 0 0 0 0];

Adj_Mat
#Calling the function

Indegree, Outdegree,Degree, Degree_Mat = find_degree(Adj_Mat);

# 1.2

println(Indegree)

# 1.3

println(Outdegree)

#1.4

Degree_Mat
```

THE OUTPUT SCREEN SHOTS :

In [3]:
```
# 1.1
Adj_Mat = [0 1 0 0 0;0 0 1 1 1;0 0 0 0 0;0 0 0 0 0;0 0 0 0 0];
Adj_Mat
```

Out[3]:
```
5x5 Array{Int64,2}:
 0  1  0  0  0
 0  0  1  1  1
 0  0  0  0  0
 0  0  0  0  0
 0  0  0  0  0
```

In [5]:
```
# 1.2
println(Indegree)
```

```
[0, 1, 1, 1, 1]
```

In [6]:
```
# 1.3
println(Outdegree)
```

```
[1, 3, 0, 0, 0]
```

In [7]:
```
#1.4
Degree_Mat
```

Out[7]:
```
5x5 Diagonal{Int64,Array{Int64,1}}:
 1  ·  ·  ·  ·
 ·  4  ·  ·  ·
 ·  ·  1  ·  ·
 ·  ·  ·  1  ·
 ·  ·  ·  ·  1
```