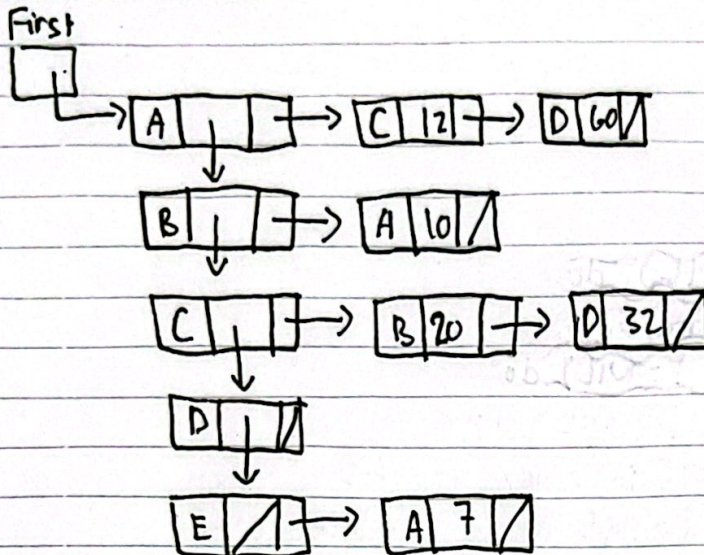


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## Tugas Minggu 12 : Graph

1. Sebuah graf berarah dan berbobot direpresentasikan dengan multi linked-list berikut :



ADT

type `adrVertex` : Pointer to vertex

type `adrEdge` : Pointer to edge

type `Vertex` :  $\langle$  id : Char,  
next : `adrVertex`,  
firstEdge : `adrEdge`  $\rangle$

type `Edge` :  $\langle$  id Vertex : Char,  
weight : integer,  
next : `adrEdge`  $\rangle$

type `graph` :  $\langle$  first : `adrVertex`  $\rangle$

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Buat fungsi berikut :

function inDegree ( $G : \text{graph}$ ,  $V : \text{adrVertex}$ )  $\rightarrow \text{integer}$

{ Menghitung derajat masuk (in-degree) untuk simpul  $v$  }

kamus

jumlahDegree : integer

$P : \text{adrVertex}$

$e : \text{adrEdge}$

Algoritma.

jumlahDegree = 0

$P = G.\text{first}$

while ( $P \neq \text{NIL}$ ) do

$e = P \rightarrow \text{firstEdge}$

while ( $e \neq \text{NIL}$ ) do

if ( $e \rightarrow \text{idVertex} == V \rightarrow \text{id}$ ) then

jumlahDegree = jumlahDegree + 1

endif

$e = e \rightarrow \text{next}$

endwhile

$P = P \rightarrow \text{next}$

endwhile

return jumlahDegree

Endfunction

function outDegree ( $G : \text{graph}$ ,  $V : \text{adrVertex}$ )  $\rightarrow \text{integer}$

{ Menghitung derajat keluar (out-degree) untuk simpul  $v$  }

kamus

jumlahOutDegree : integer

$e : \text{adrEdge}$

Algoritma

jumlahOutDegree = 0

$e = V \rightarrow \text{firstEdge}$

while ( $e \neq \text{NIL}$ ) do

jumlahOutDegree = jumlahOutDegree + 1

$e = e \rightarrow \text{next}$

endwhile

return jumlahOutDegree

Endfunction



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function degree ( $G$  : graph,  $v$  : adrVertex)  $\rightarrow$  integer  
[Menghitung derajat Simpul  $v$ ]

kamus

function inDegree (graph, adrVertex)  $\rightarrow$  integer

function outDegree (graph, adrVertex)  $\rightarrow$  integer

jumlahDegree : integer

jumlahOutDegree : integer

Algoritma

jumlahDegree = inDegree ( $G$ ,  $v$ )

jumlahOutDegree = outDegree ( $G$ ,  $v$ )

return jumlahDegree + jumlahOutDegree

End function

function isSimpleGraph ( $G$  : graph)  $\rightarrow$  boolean

[Menghasilkan true jika  $G$  graf sederhana atau false jika bukan graf sederhana. Graf sederhana tidak mengandung busur Parallel. Pada graf berarah beberapa busur disebut busur Parallel jika simpul awal dan simpul tujuannya sama?]

kamus

$v$  : adrVertex

$e$  : adrEdge

Algoritma

$v = G.first$

while ( $v \neq NIL$ ) do

$e = v \rightarrow firstEdge$

while ( $e \neq NIL$ ) do

if ( $(e \rightarrow idVertex) == v \rightarrow id$ )

return false

else

$e = e \rightarrow next$

end if

end while

$v = v \rightarrow next$

end while

return true

end function

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