Data Structures

Double Linked List – insert_after

Team Emertxe

Double Linked List

Data Structure – Linked List

Analysis – insert_after

Analysis: Logic / Cases

Flowchart

Algorithm

Code

Insert after - Analysis

Analysis

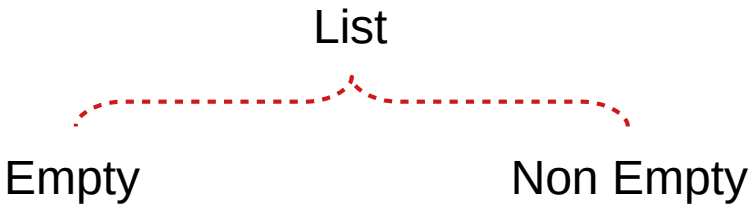
insert_after

Cases :

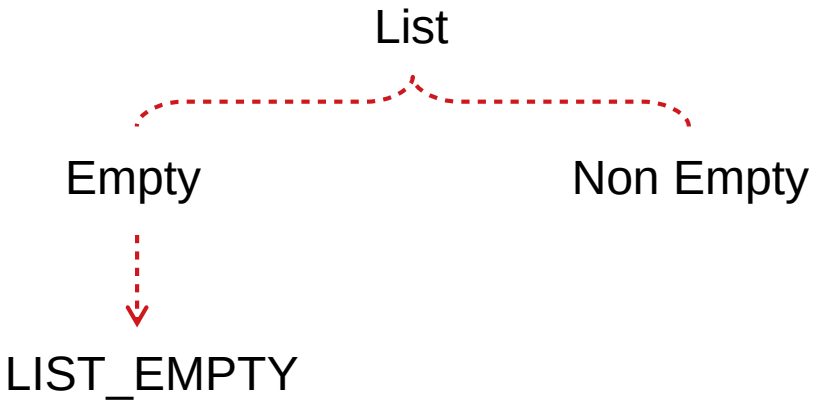
Analysis
insert_after

List

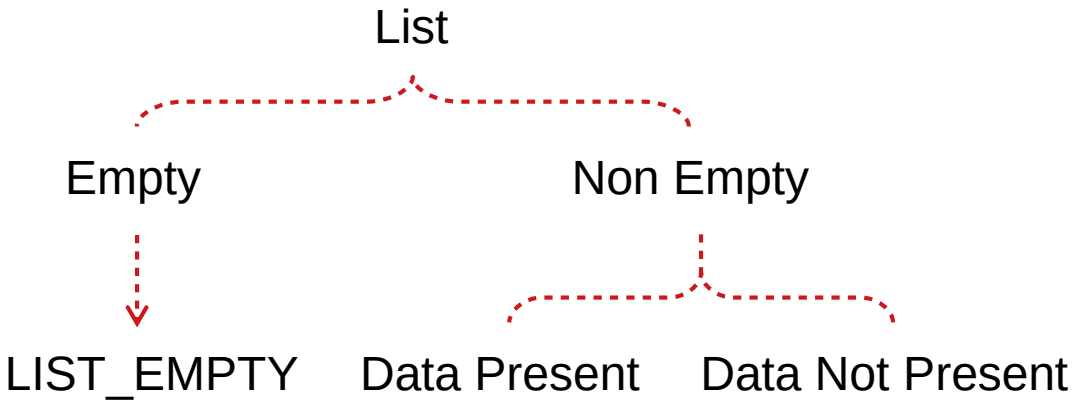
Cases :



Cases :



Cases :


List
Empty
Non Empty
LIST_EMPTY
Data Present
Data Not Present

Cases :

Analysis
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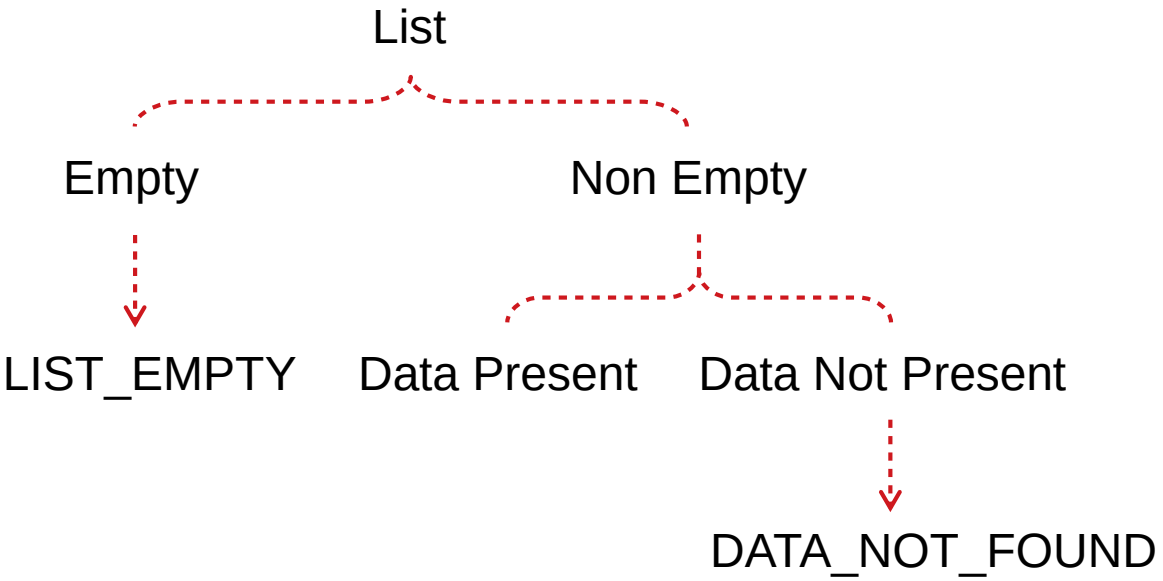

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Analysis

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Analysis
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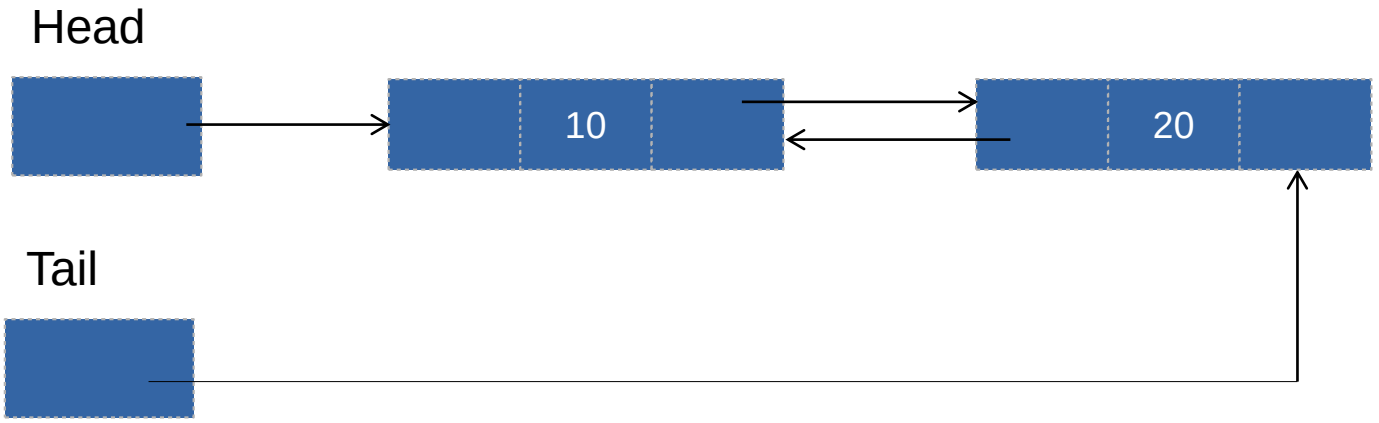
Non Empty List



Analysis
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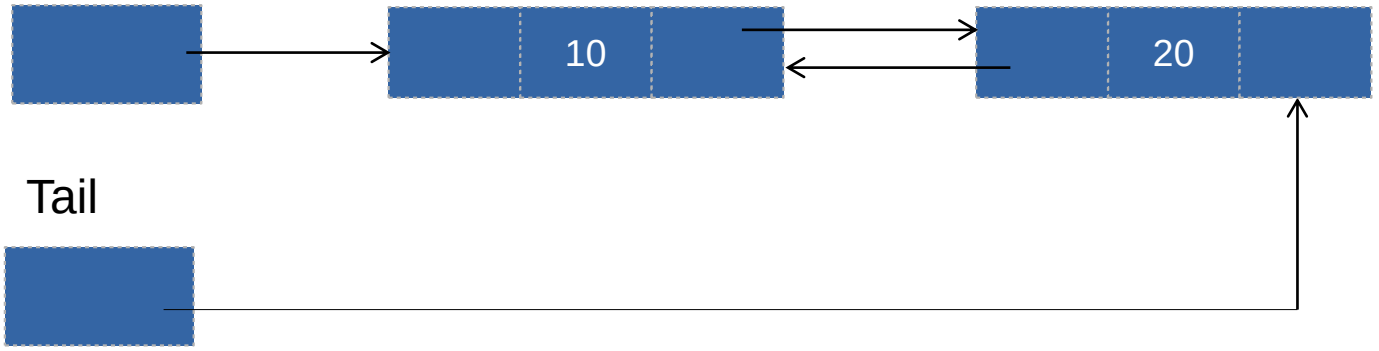
Non Empty List

g_data = 40 n_data = 25

Head



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Analysis
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Non Empty List

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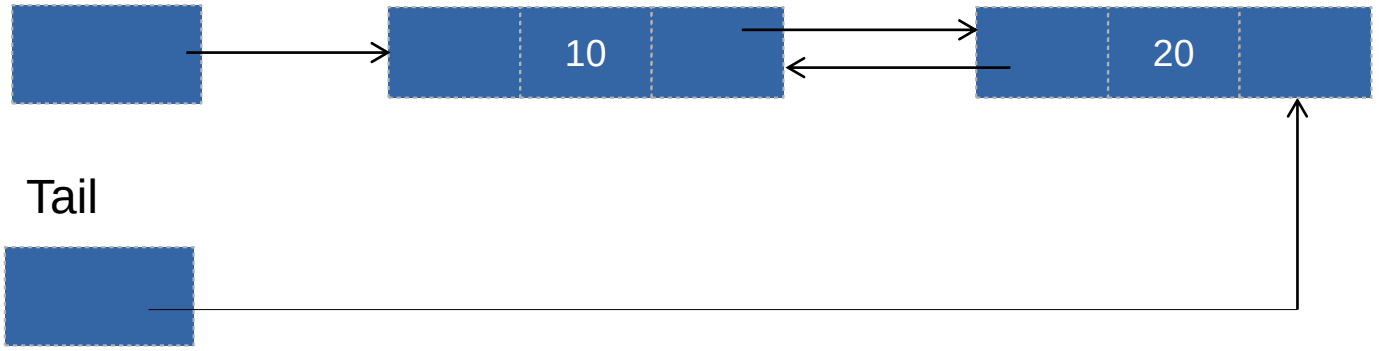
Head



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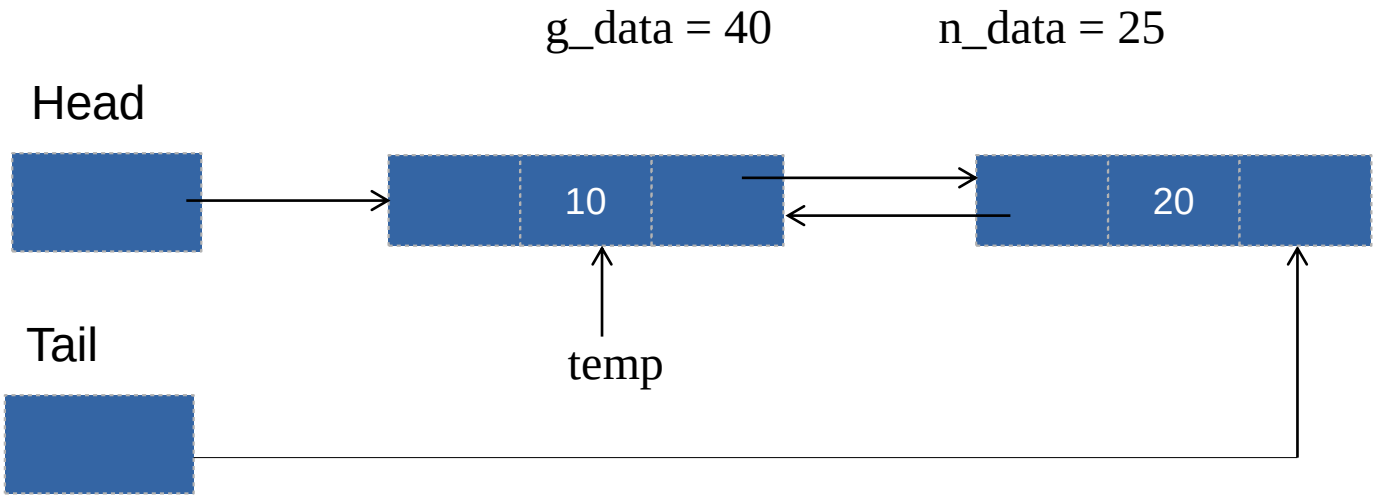

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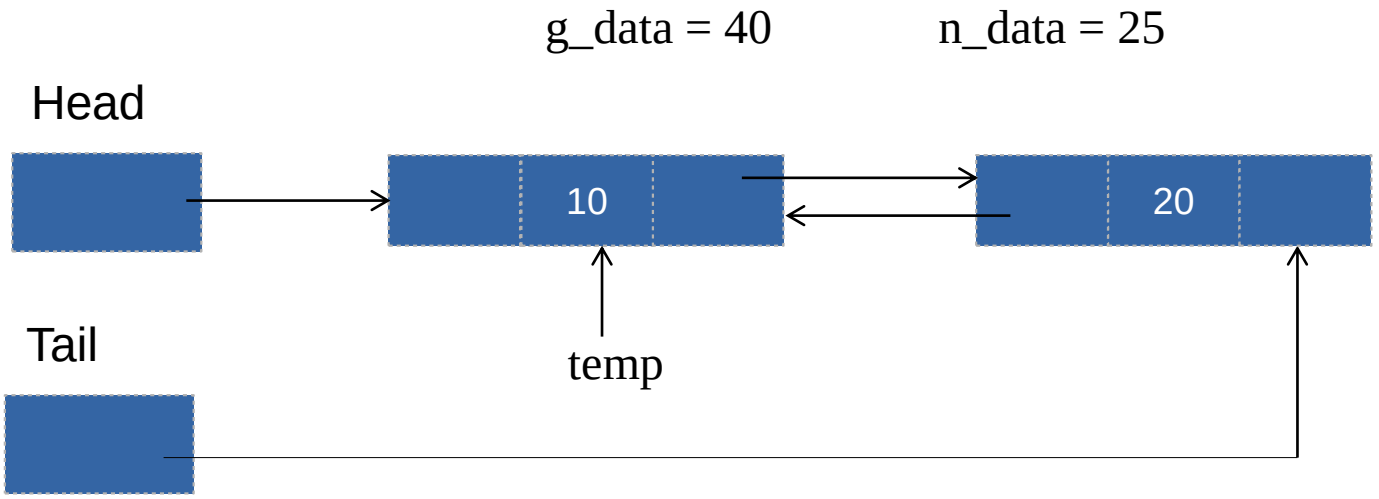

Analysis
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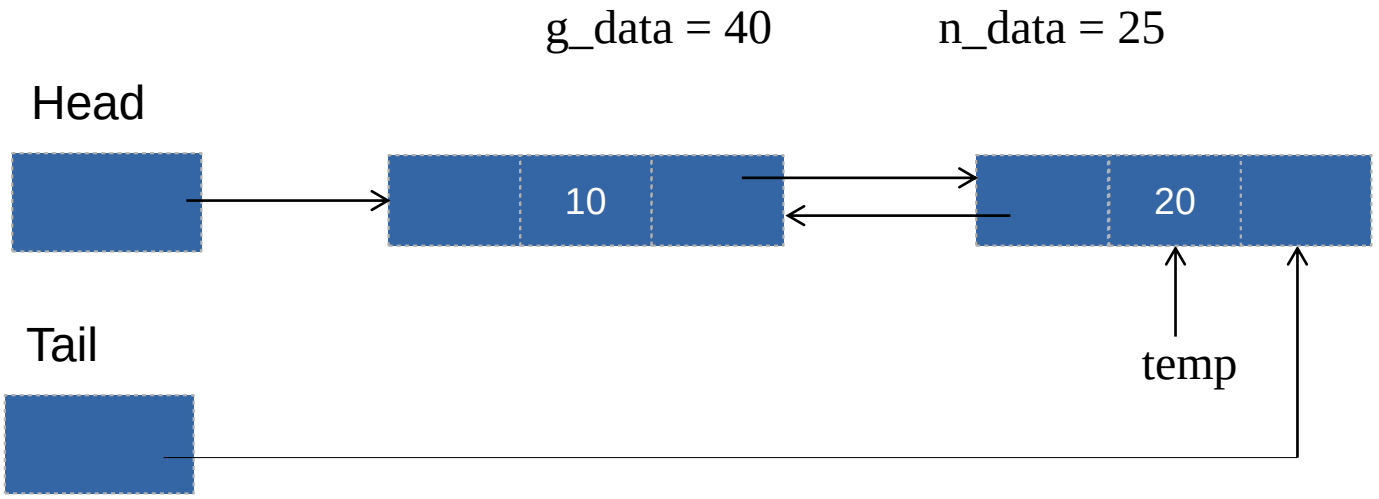

Analysis
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Non Empty List

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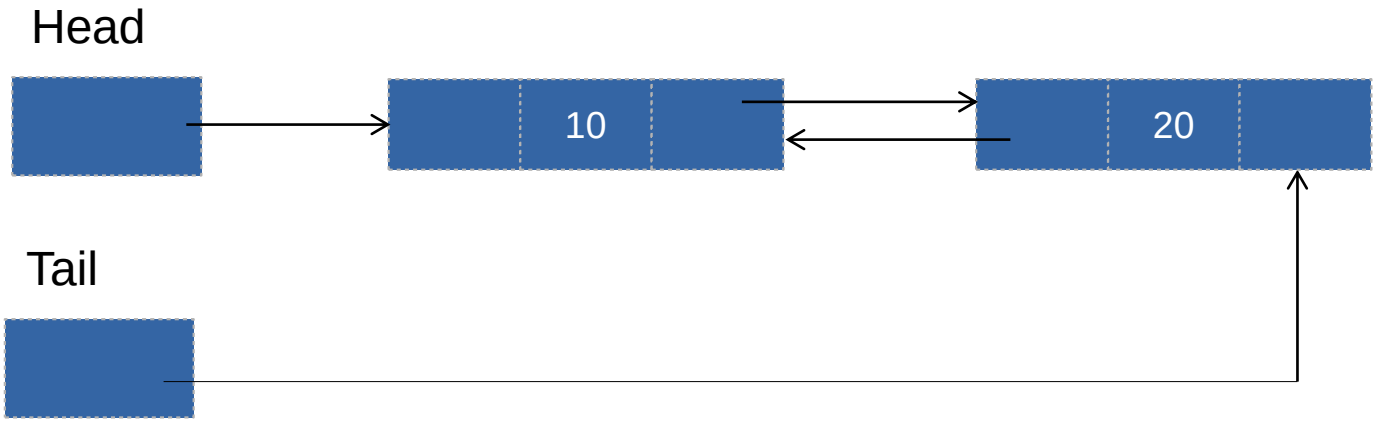

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EMERTXE

Analysis
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Non Empty List

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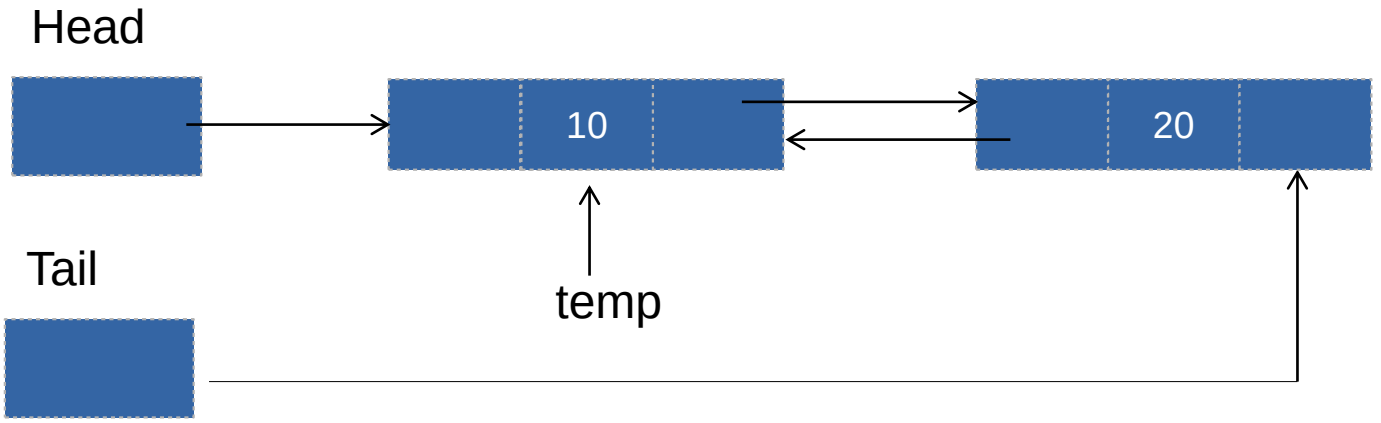

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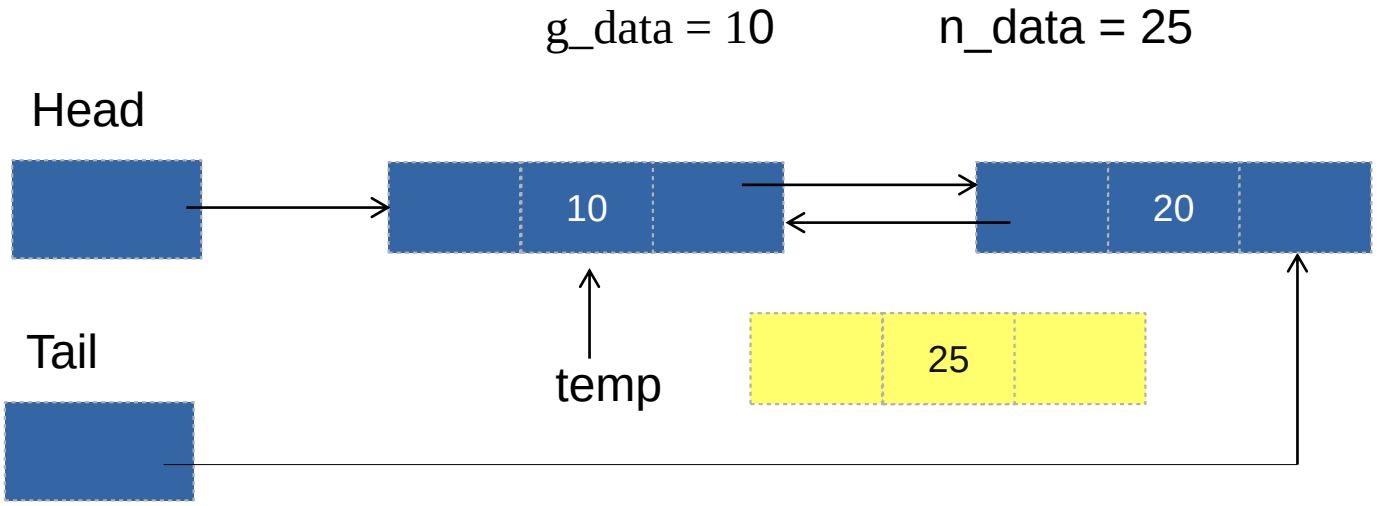

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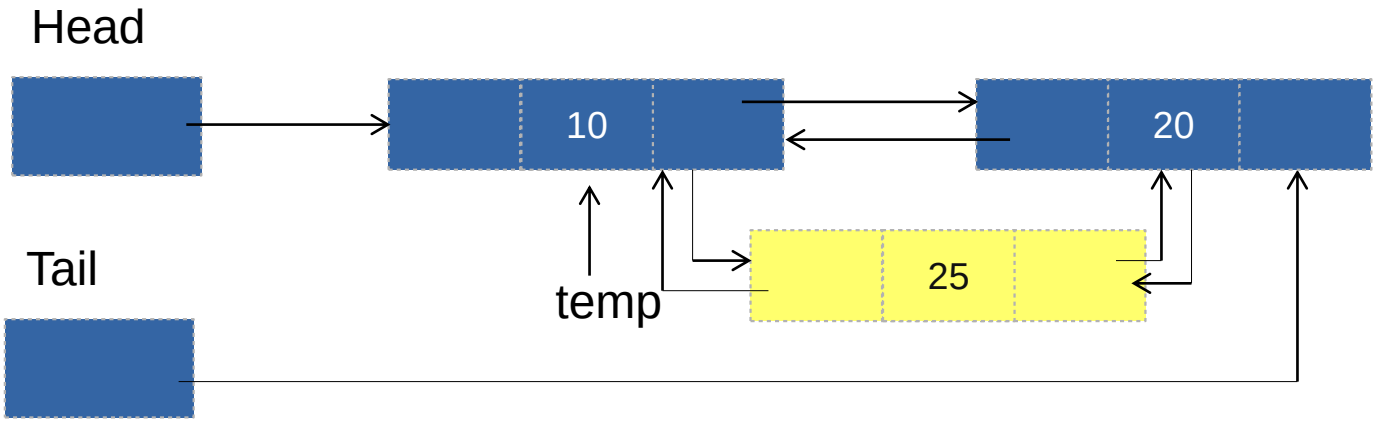

Insert after - Flowchart

Flowchart

insert_after

start

Flowchart

insert_after

Flowchart

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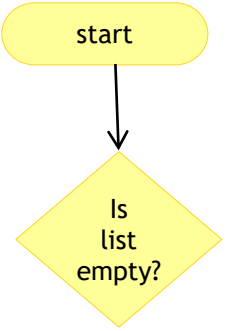

Flowchart
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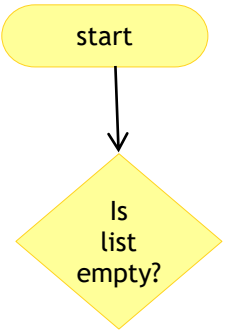

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EMERTXE

Flowchart
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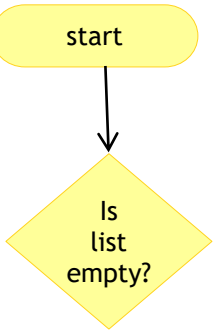

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EMERTXE

Flowchart
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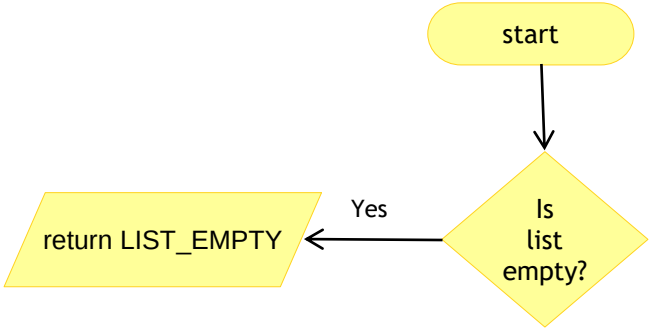


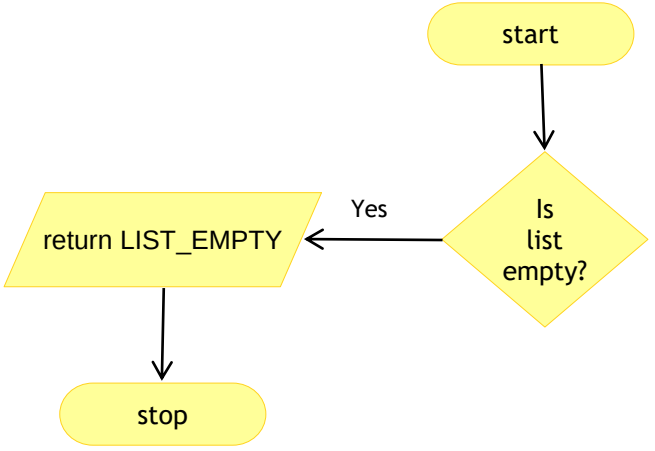
Head

NULL

Flowchart
insert_after

Head

NULL



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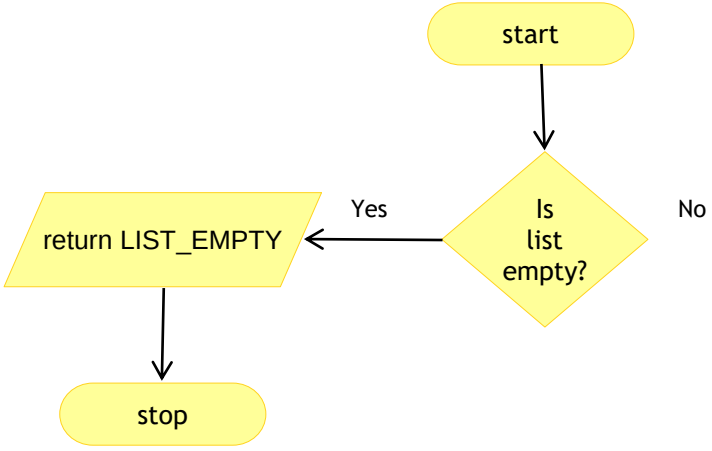

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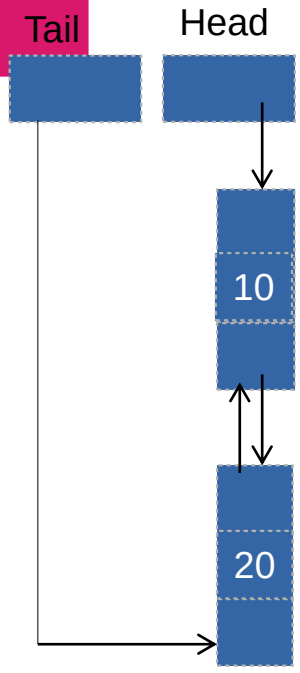

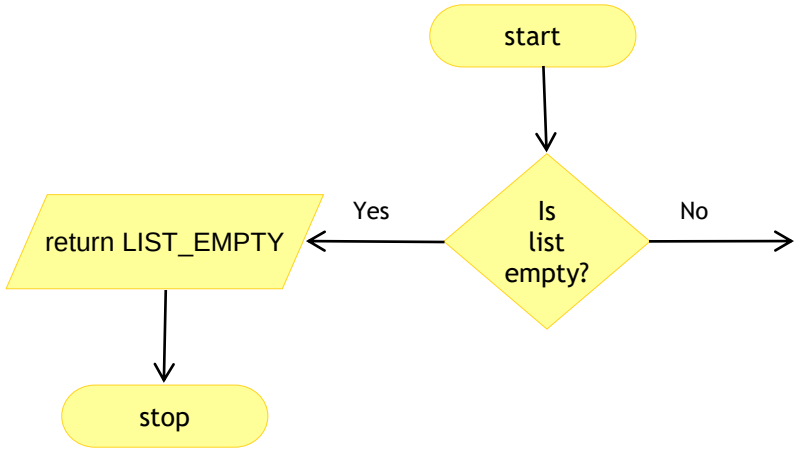

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Flowchart
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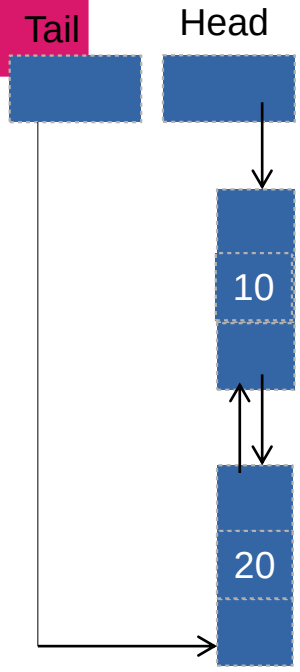

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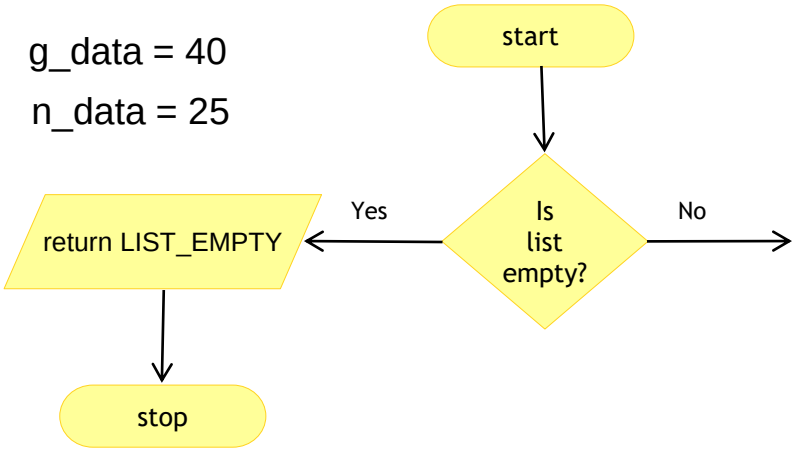

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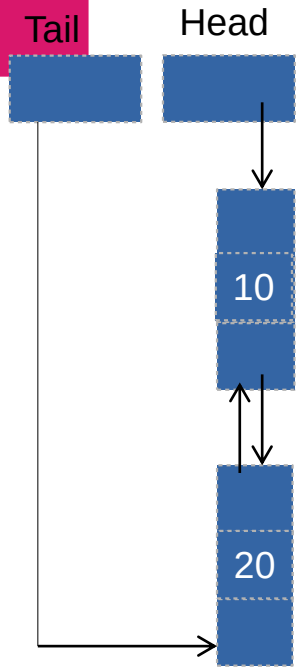

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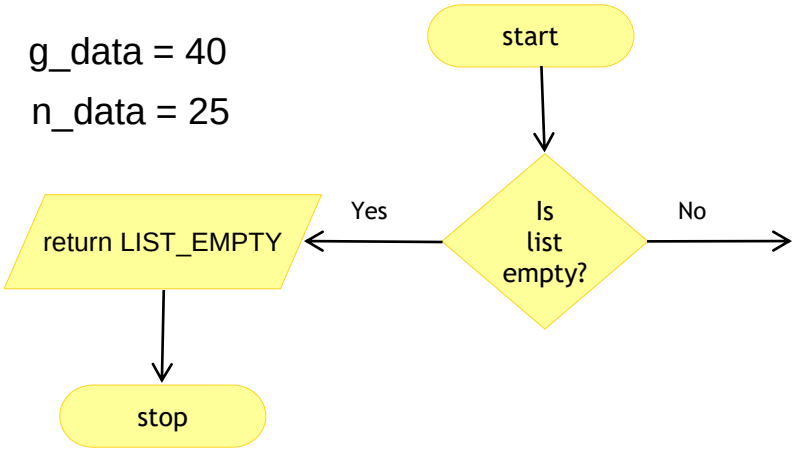

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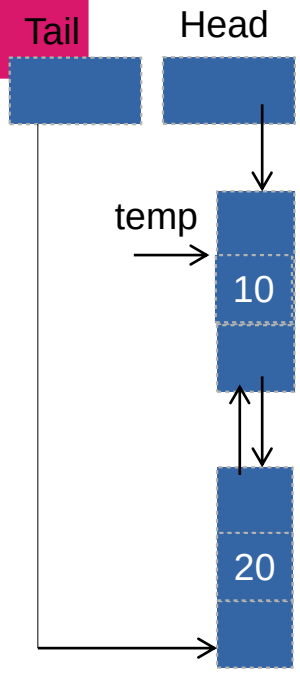

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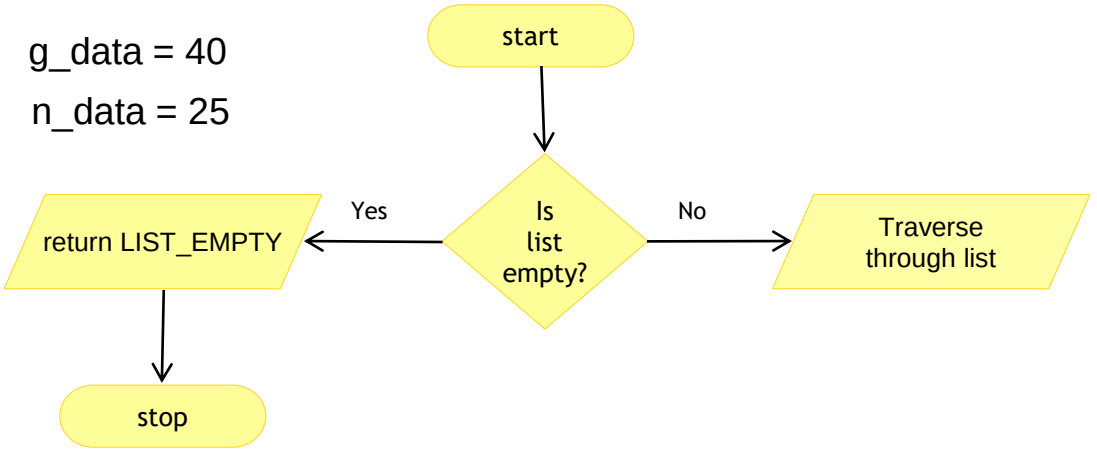

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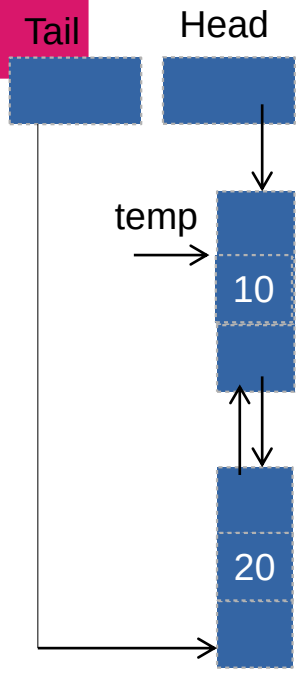

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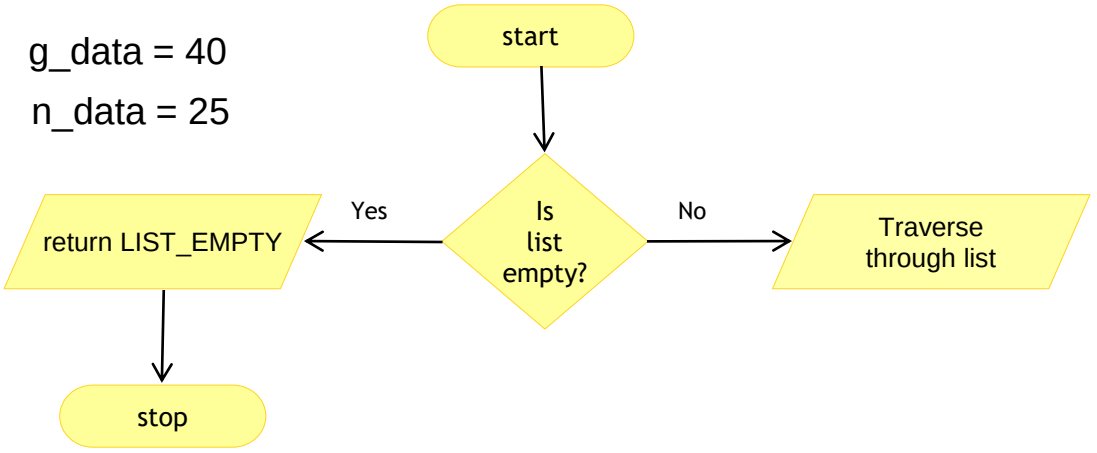

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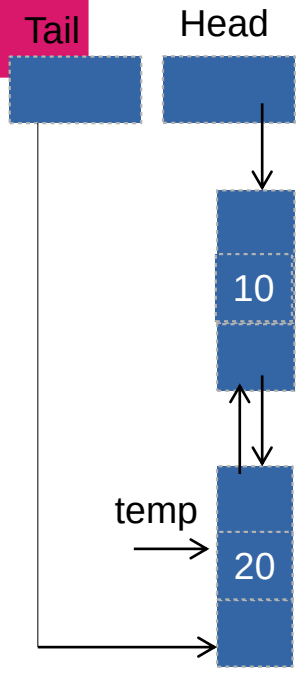

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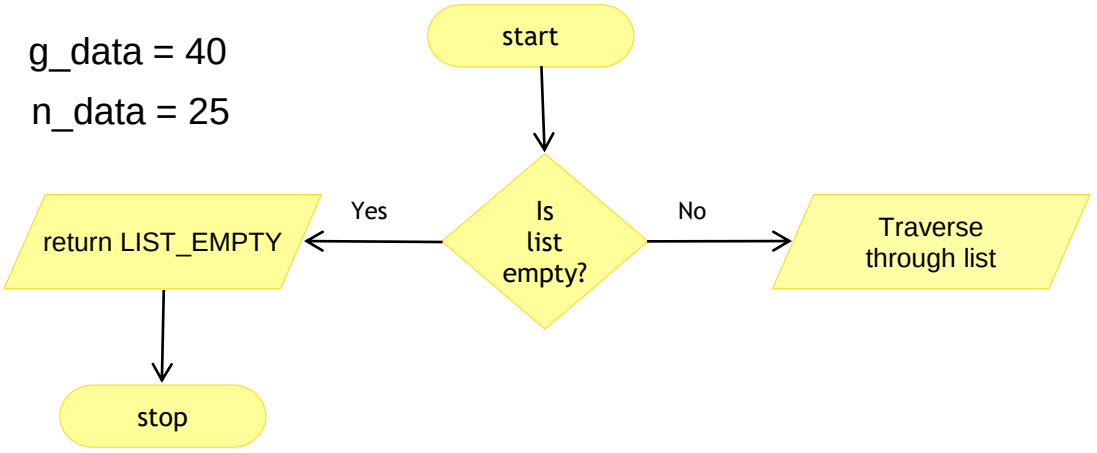

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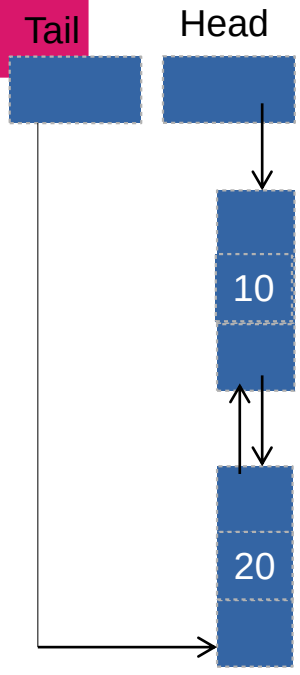

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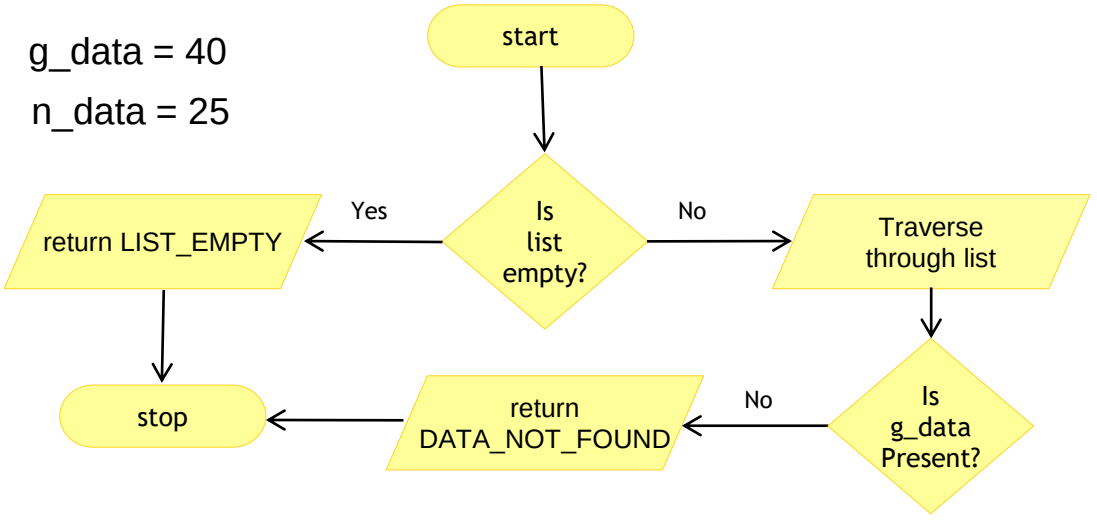

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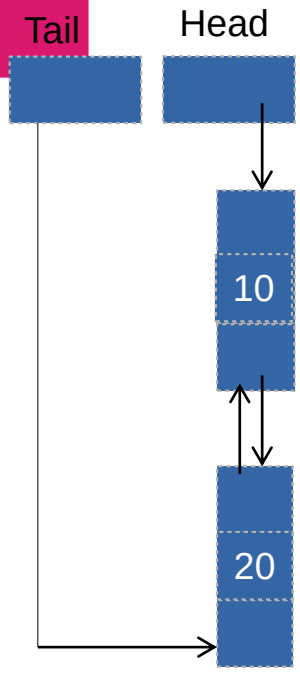

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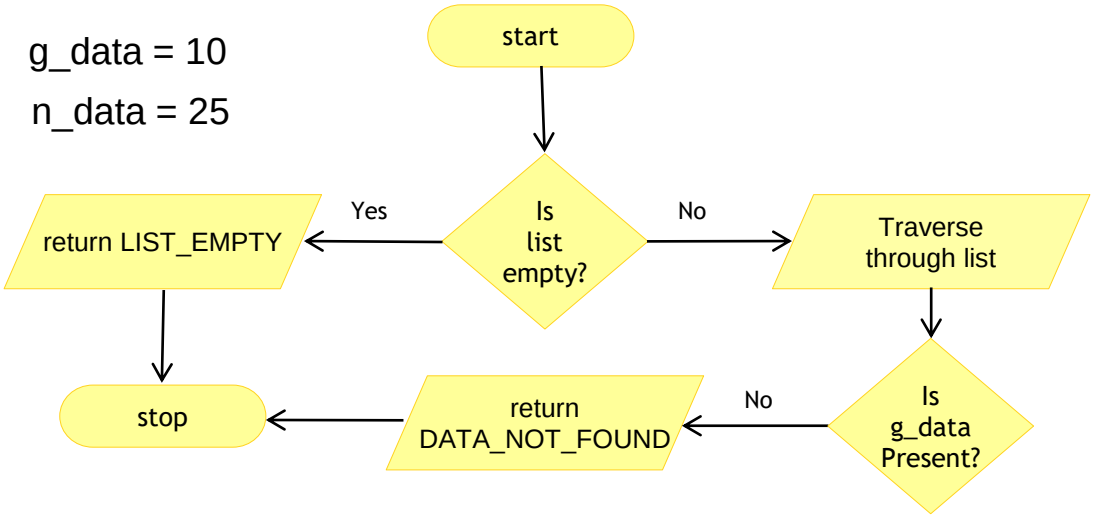

Flowchart
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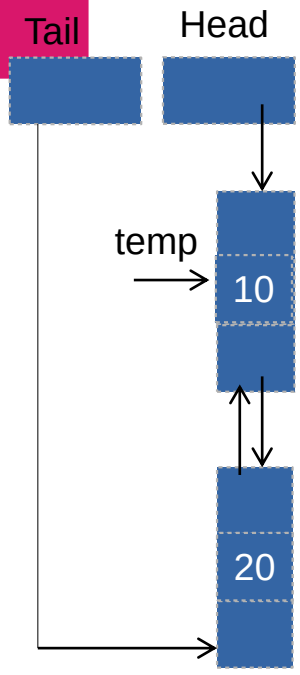

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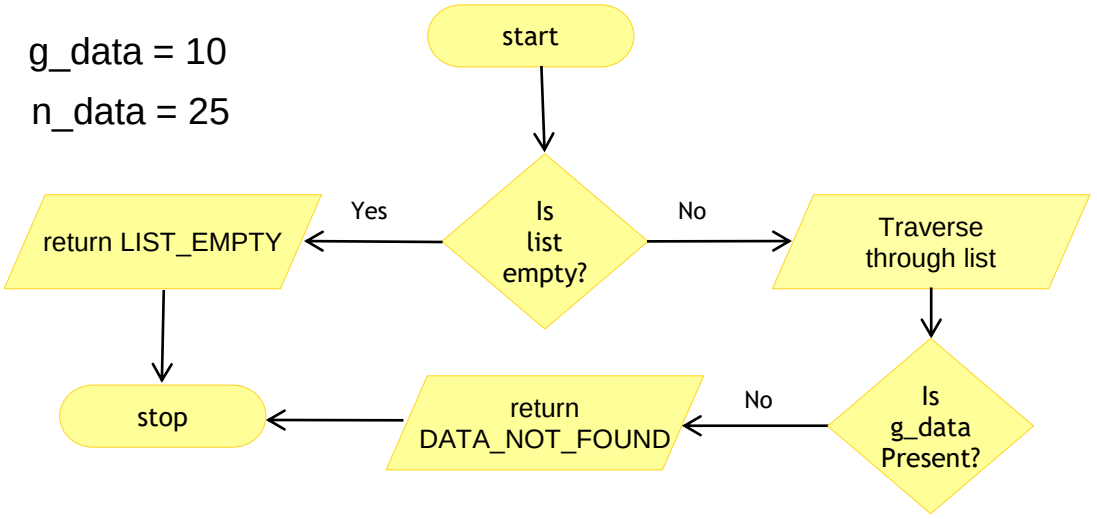

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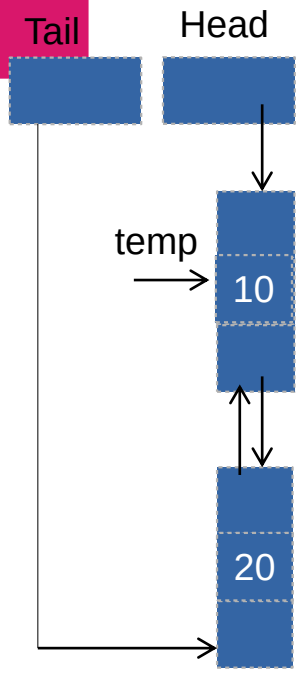

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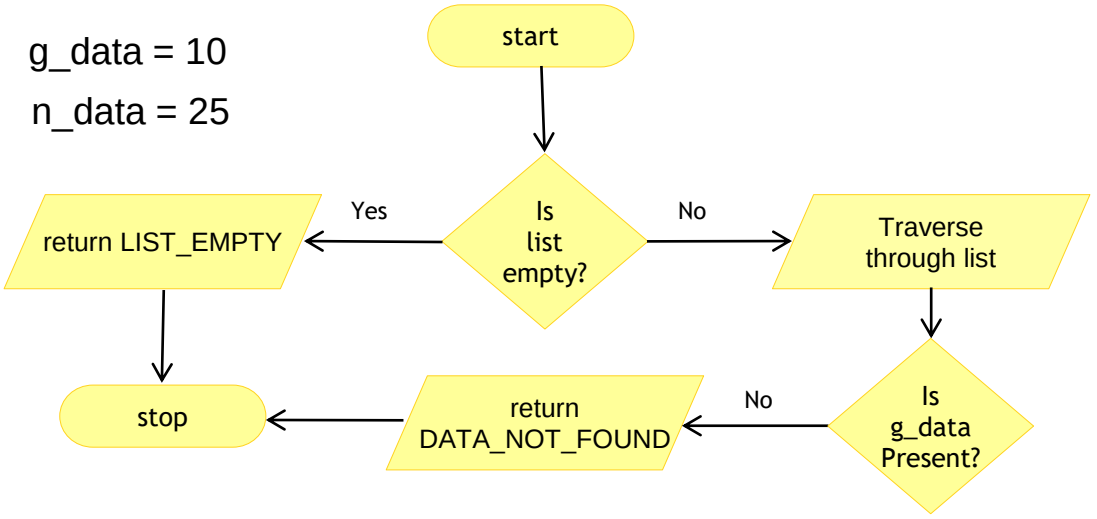

Flowchart
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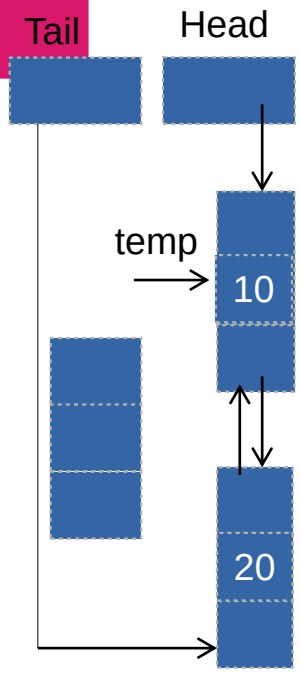

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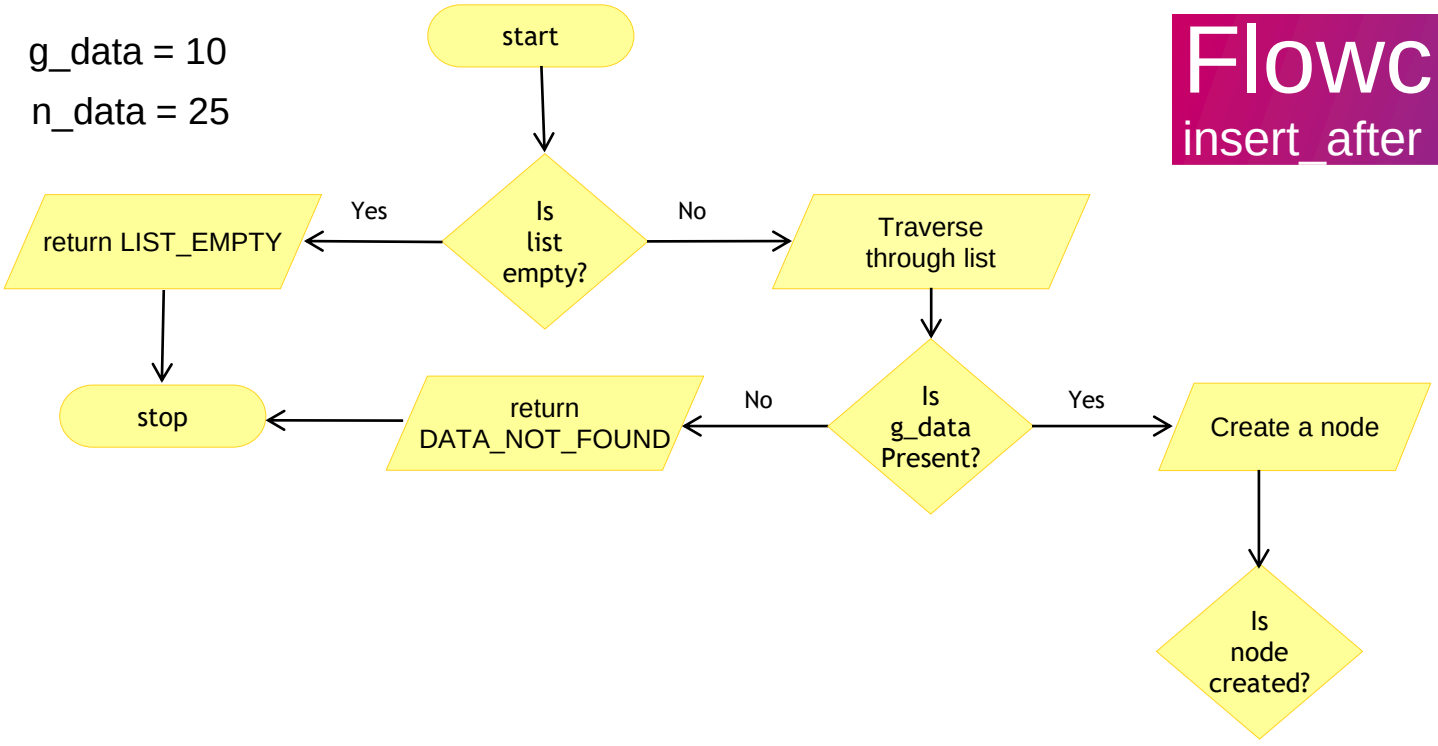

Flowchart
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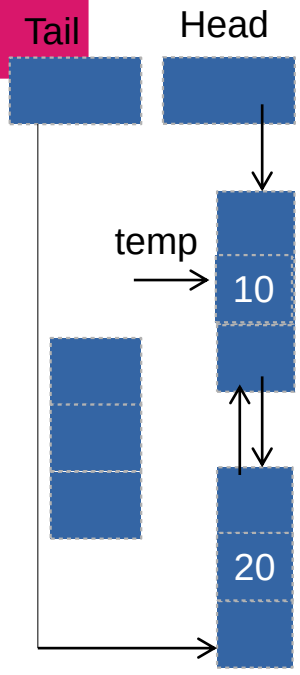

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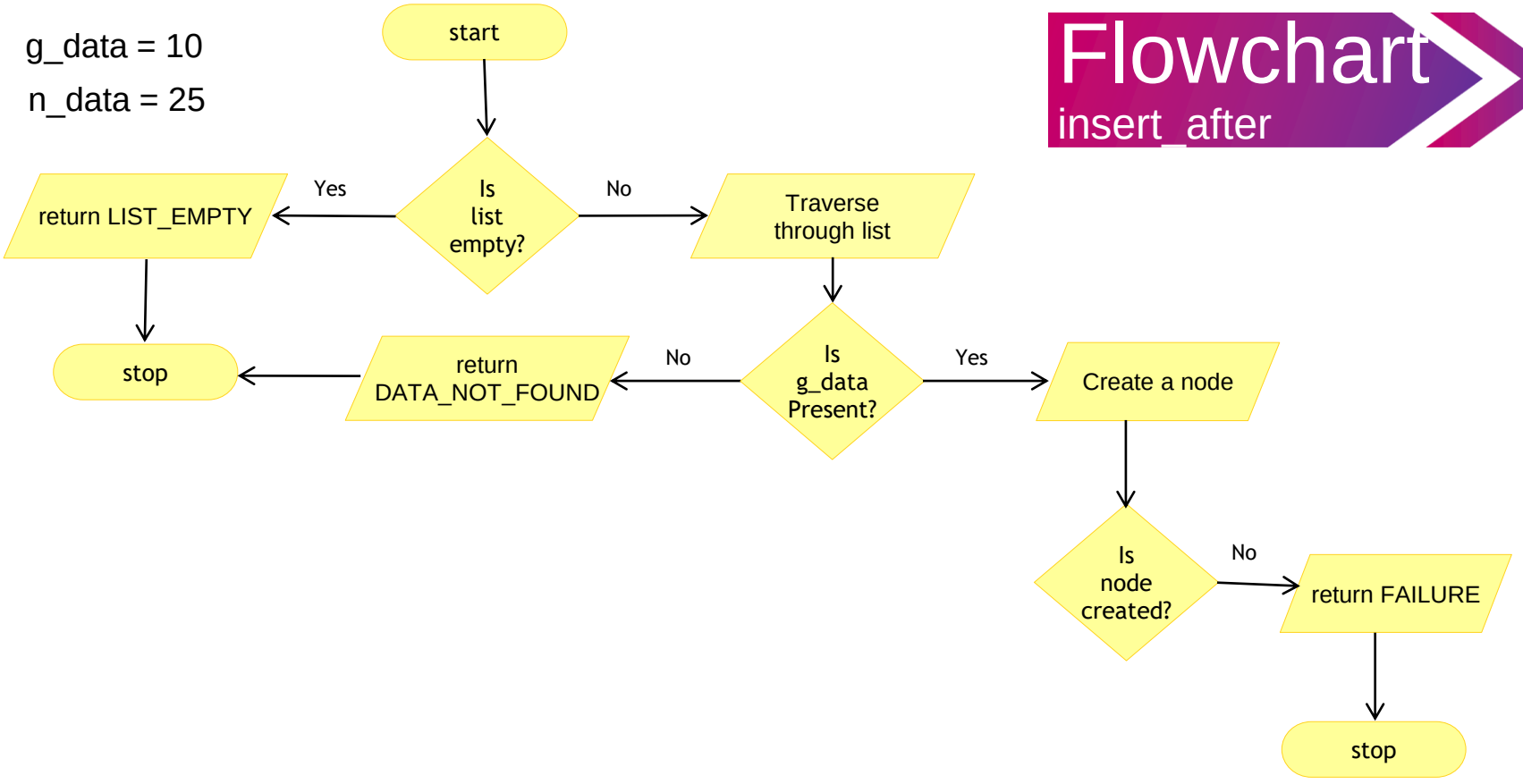

Flowchart
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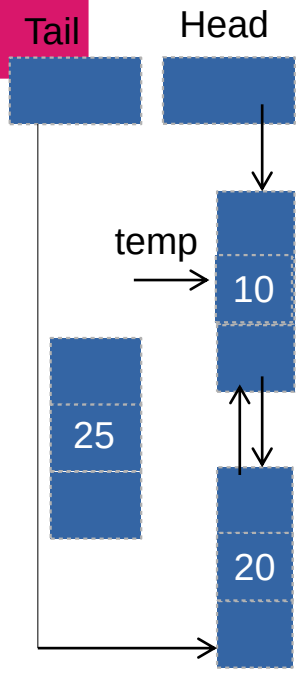

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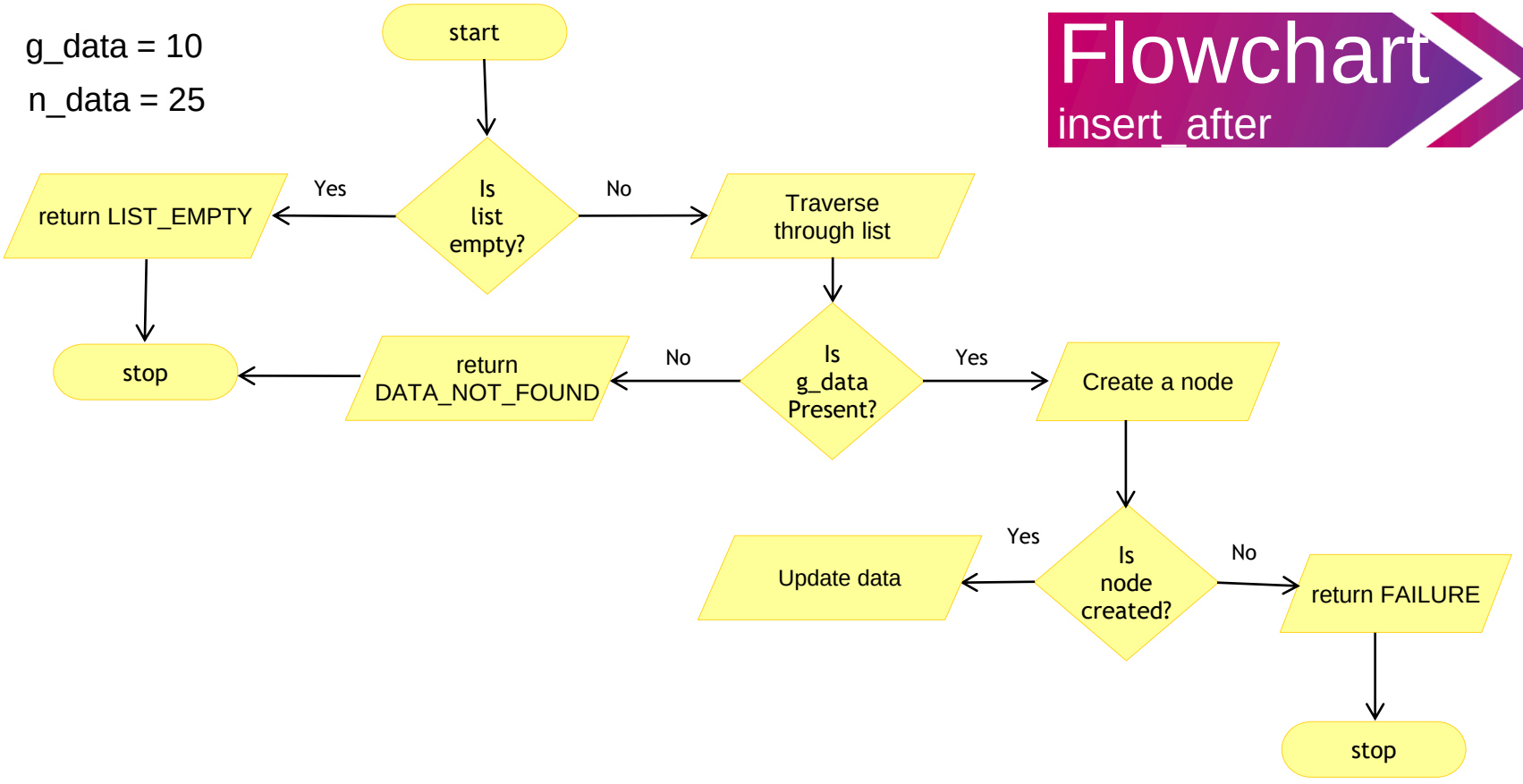
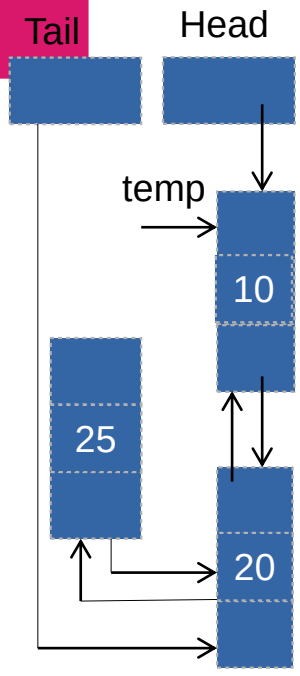
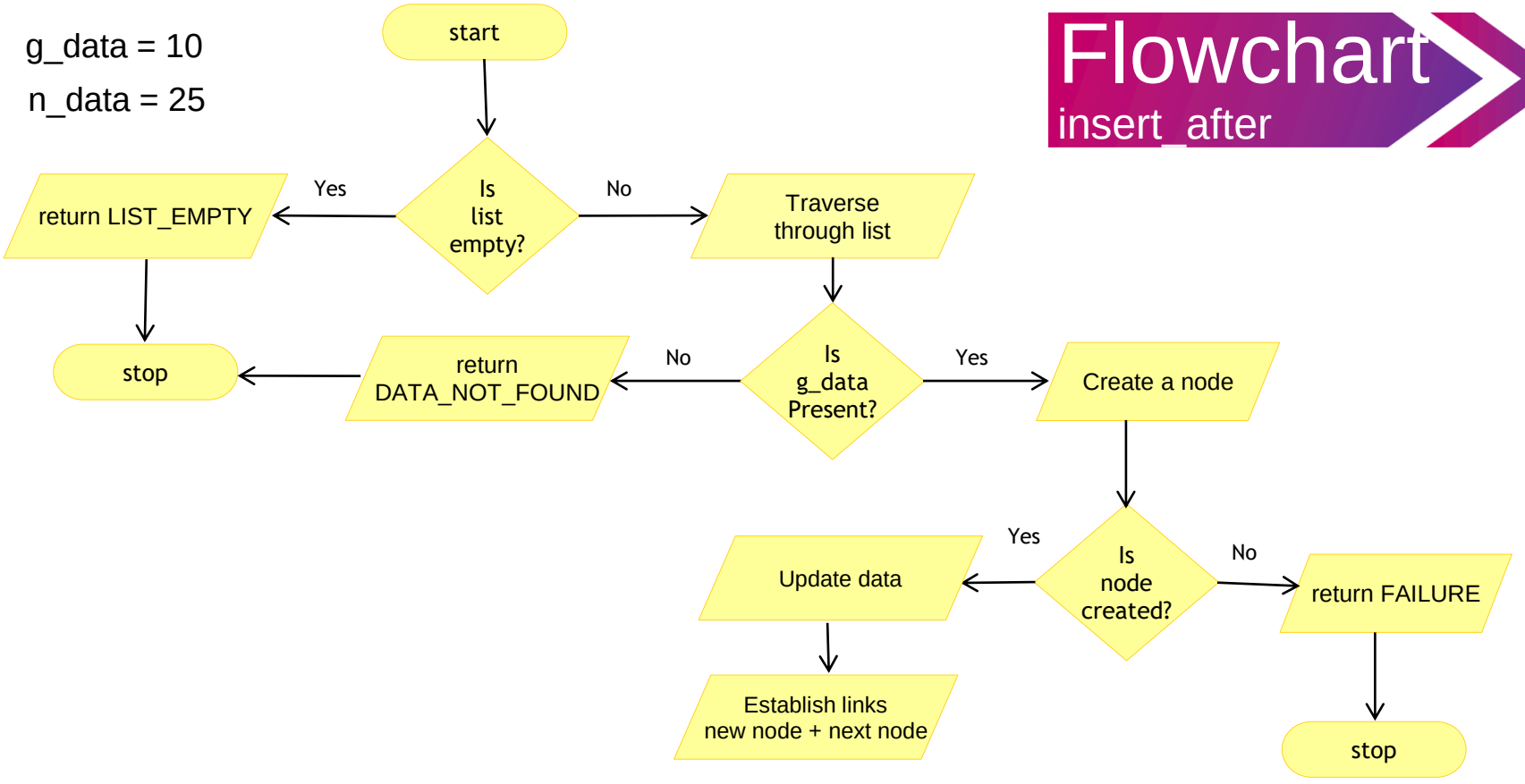


Flowchart
insert_after

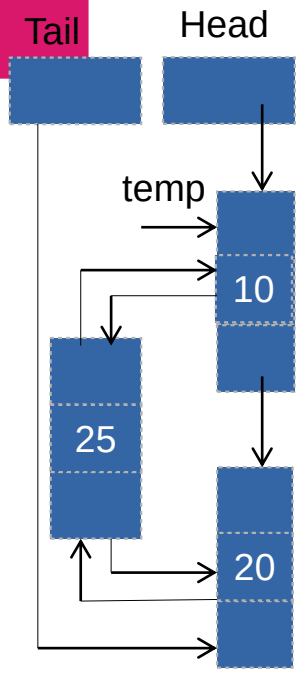


g_data = 10

n_data = 25

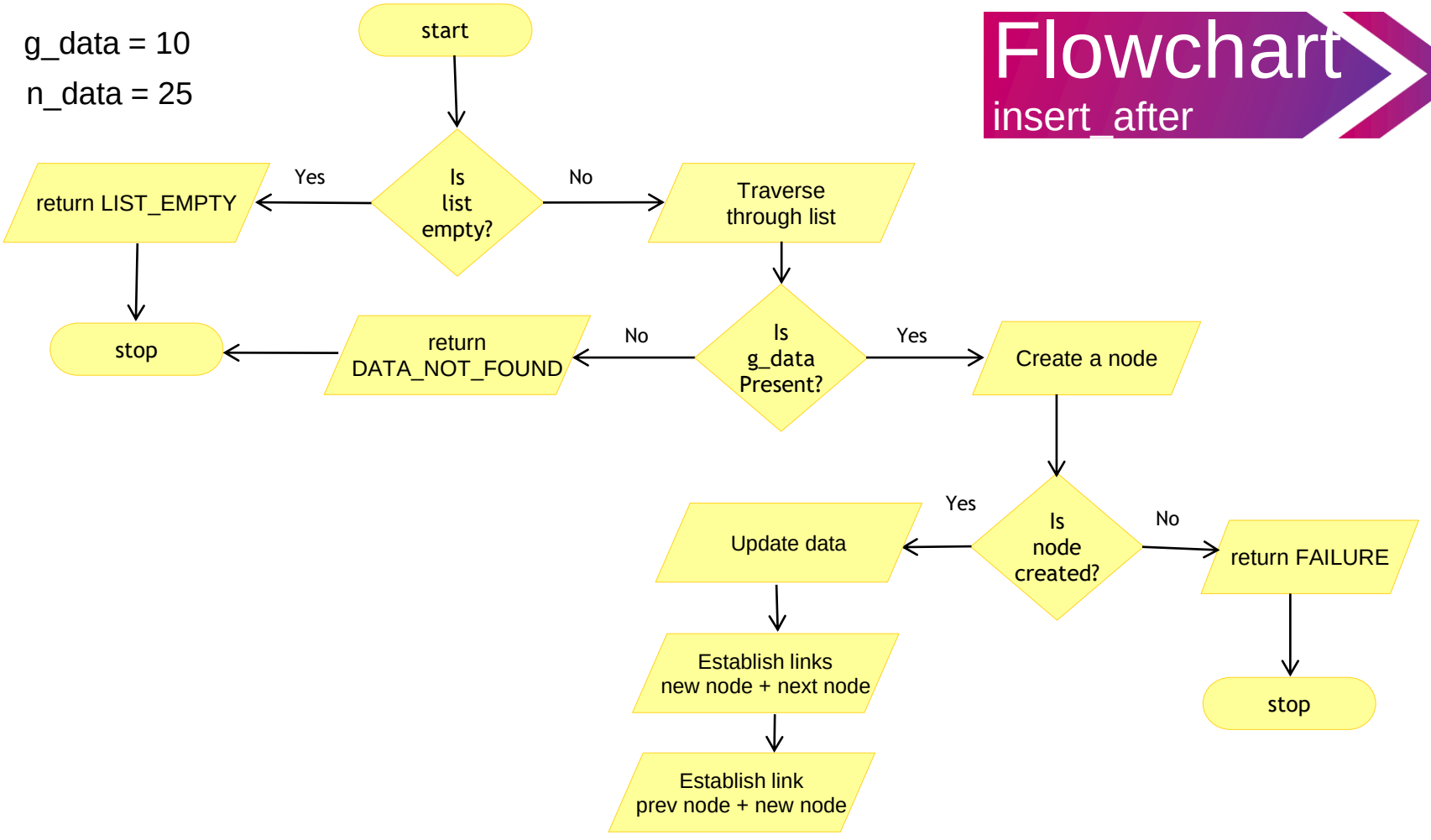


Flowchart
insert_after

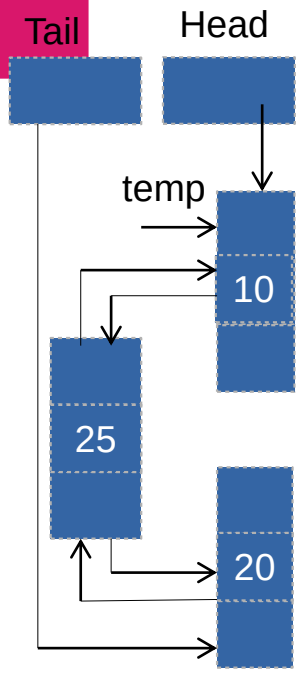


g_data = 10

n_data = 25

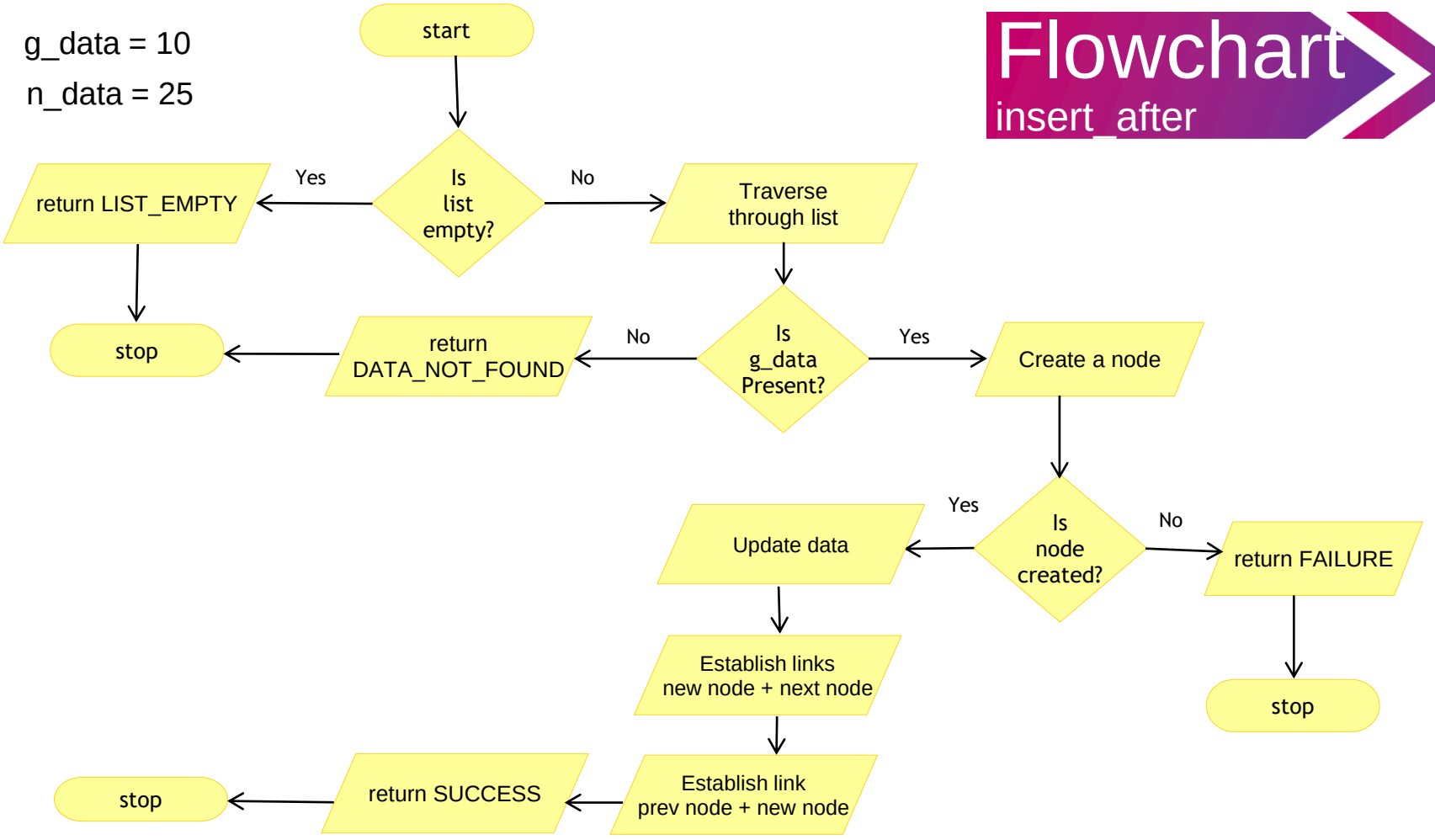


Flowchart
insert_after



g_data = 10

n_data = 25



EMERTXE

Insert after - Algorithm

Algorithm
insert_after

Algorithm
insert_after

Algorithm : Insert_after(Head,Tail,g_data,n_data)

1.Input Specification :-

Algorithm
insert_after

Algorithm : Insert_after(Head,Tail,g_data,n_data)

1.Input Specification :-

Head : Pointer containing first node address

Tail : Pointer containing last node address

g_data : Item after which we wish to insert the n_data

Algorithm
insert_after

Algorithm : Insert_after(Head,Tail,g_data,n_data)

1.Input Specification :-

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g_data : Item after which we wish to insert the n_data

n_data : Item to be added

Algorithm
insert_after

Algorithm : Insert_after(Head,Tail,g_data,n_data)

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Head : Pointer containing first node address

Tail : Pointer containing last node address

g_data : Item after which we wish to insert the n_data

n_data : Item to be added

2.Output Specification :-

Algorithm
insert_after

Algorithm : Insert_after(Head,Tail,g_data,n_data)

1.Input Specification :-

Head : Pointer containing first node address
Tail : Pointer containing last node address
g_data : Item after which we wish to insert the n_data
n_data : Item to be added

2.Output Specification :-

Status : SUCCESS / FAILURE
LIST_EMPTY / DATA_NOT_FOUND

Insert_after(Head,Tail,g_data,n_data)

Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

Algorithm
insert_after

g_data = 40

n_data = 25

EMERTXE

Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)

g_data = 40

n_data = 25

Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)

g_data = 40

n_data = 25

Head

NULL

Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)
   return LIST_EMPTY

g_data = 40

n_data = 25

Head

NULL

Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

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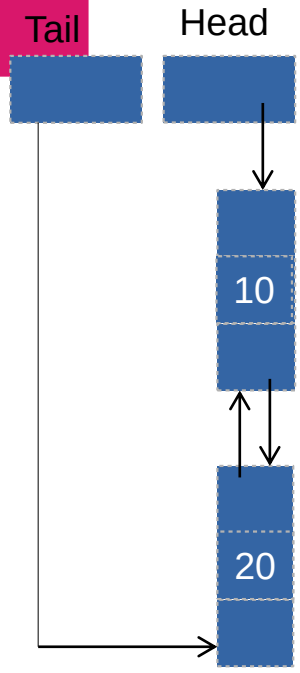
g_data = 40

n_data = 25



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   return LIST_EMPTY

Algorithm
insert_after

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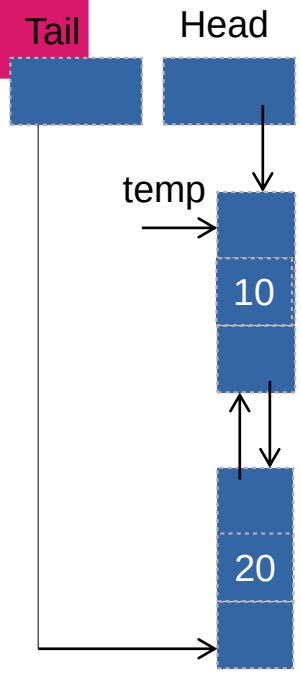
n_data = 25



Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head

Algorithm
insert_after

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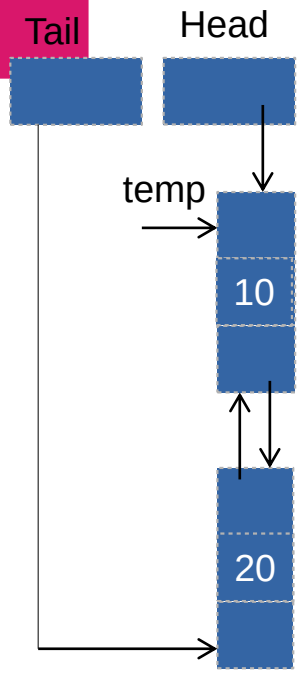

Algorithm
insert_after

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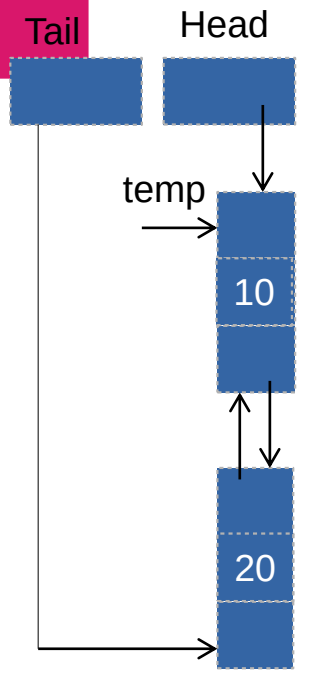
n_data = 25

EMERTXE



Algorithm
insert_after

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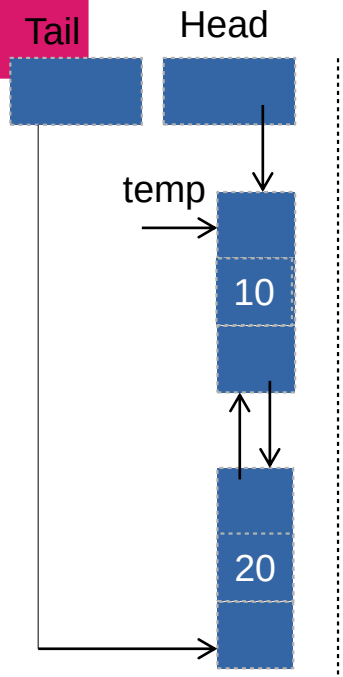
EMERTXE



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Algorithm
insert_after

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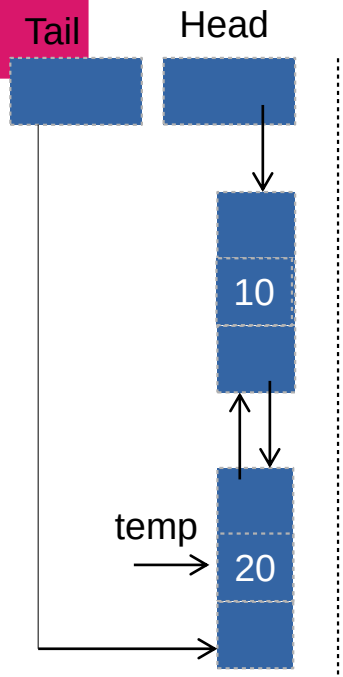

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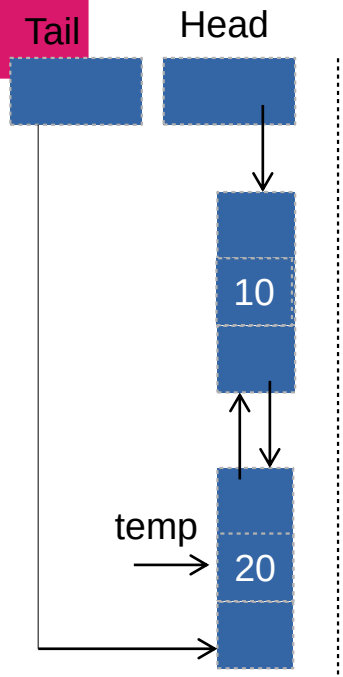
Algorithm
insert_after

g_data = 40

n_data = 25



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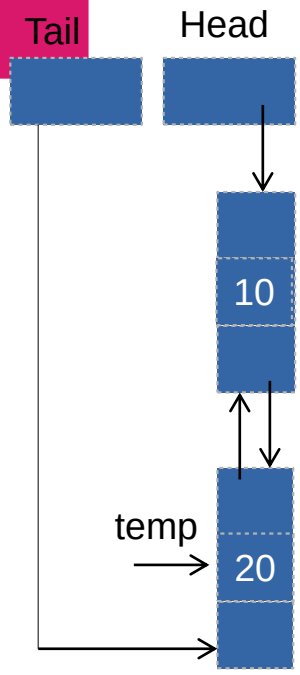
EMERTXE

Algorithm
insert_after



temp = NULL

Insert_after(Head,Tail,g_data,n_data)

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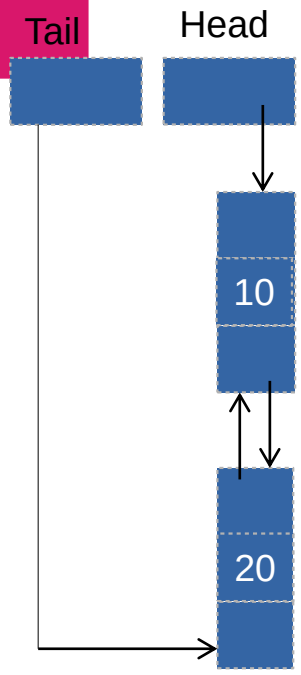
EMERTXE

Algorithm
insert_after



temp = NULL

Insert_after(Head,Tail,g_data,n_data)

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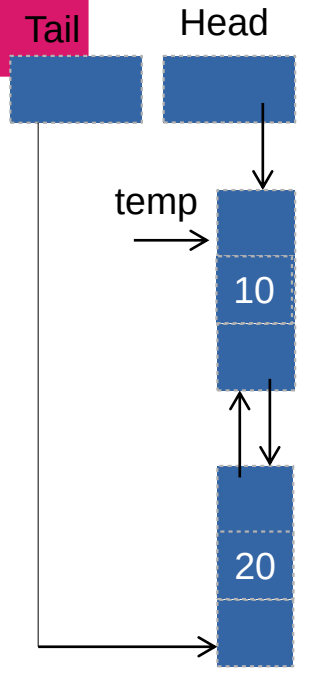
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
   3.1 if (temp ⟶ data != g_data)
   temp = temp ⟶ next

g_data = 40

n_data = 25

4. return DATA_NOT_FOUND

EMERTXE



Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
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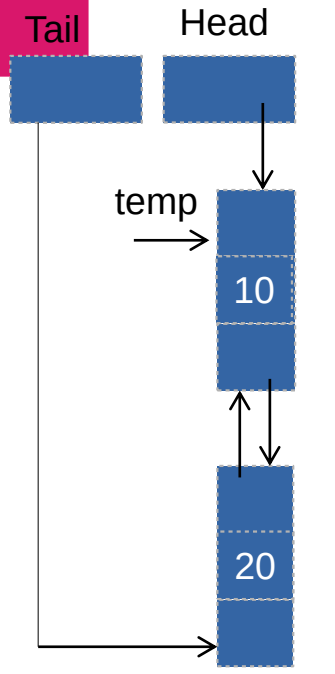
   temp = temp → next

g_data = 10

n_data = 25

EMERTXE



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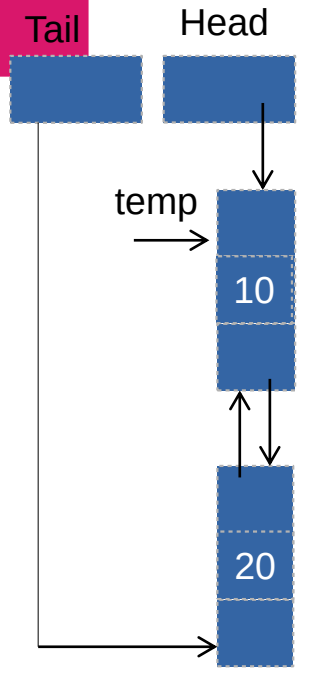

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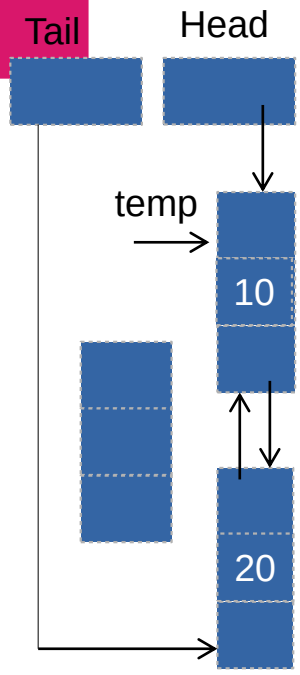
EMERTXE

Algorithm
insert_after



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1. if (Head = NULL)
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2. temp = Head
3. while (temp != NULL)
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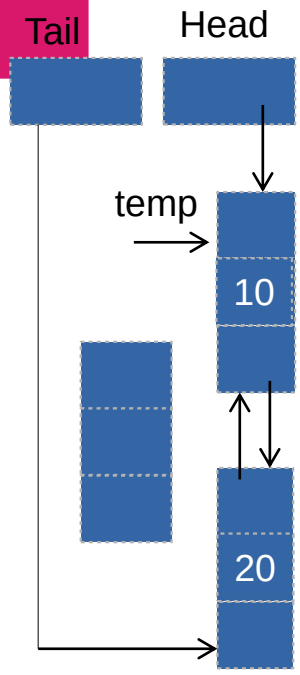
   3.2 else
   new = Memalloc(sizeof (Dlist))

g_data = 10

n_data = 25

EMERTXE

Algorithm
insert_after



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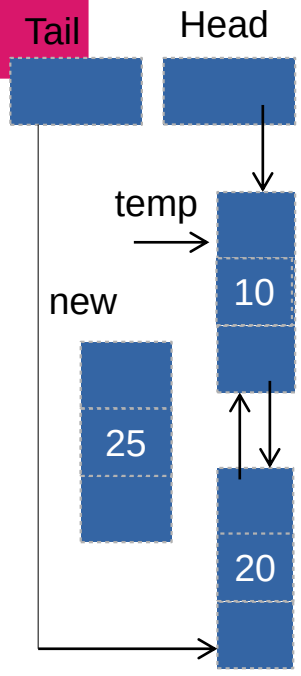
   temp = temp ⟶ next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE

g_data = 10

n_data = 25

EMERTXE

Algorithm
insert_after



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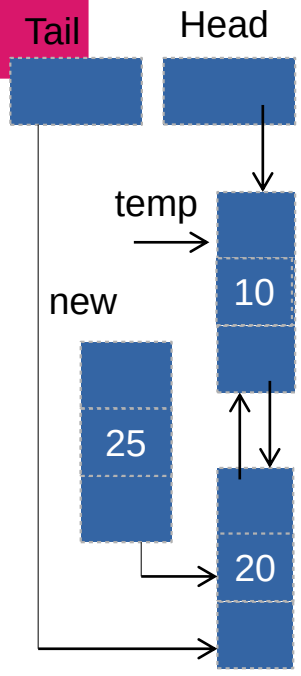
n_data = 25

EMERTXE



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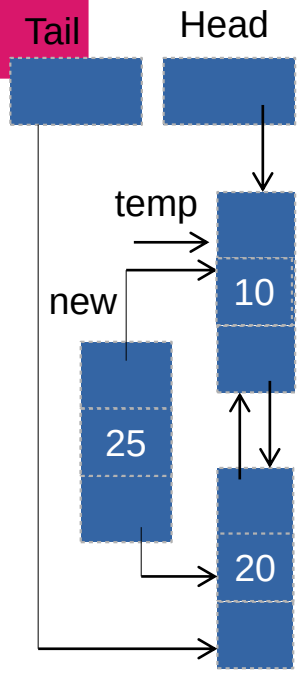
   new → data = n_data
   new → next = temp → next

g_data = 10

n_data = 25

EMERTXE



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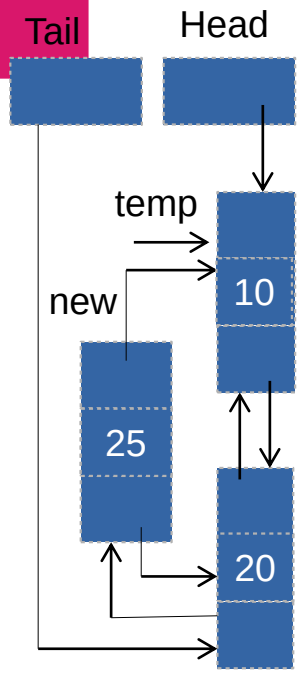
   if (new = NULL)
   return FAILURE
   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

g_data = 10

n_data = 25

EMERTXE



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   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

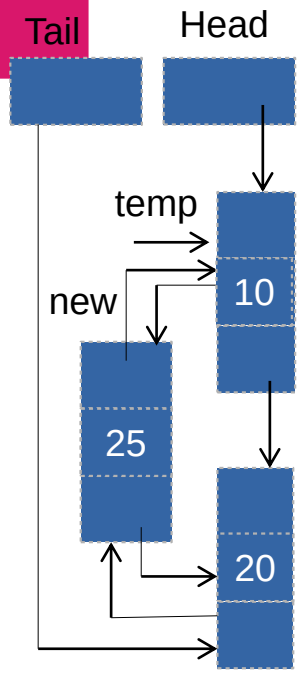
   temp ⟶ next ⟶ prev = new

g_data = 10

n_data = 25

EMERTXE

Algorithm
insert_after



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   new ⟶ next = temp ⟶ ~~next~~
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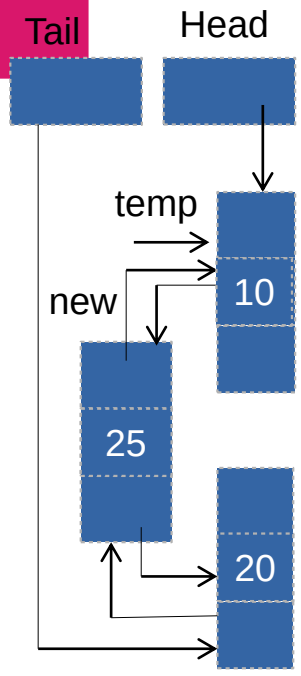
   temp ⟶ next = new

g_data = 10

n_data = 25

EMERTXE



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   3.2 else
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   if (new = NULL)
   return FAILURE
   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

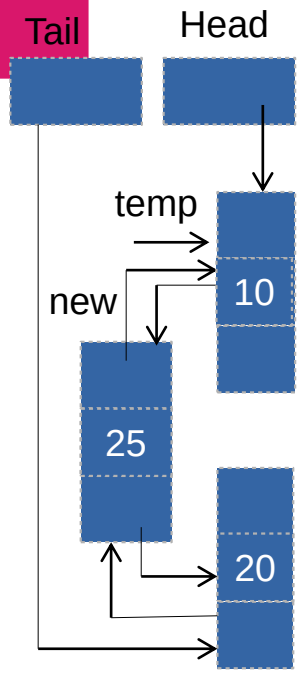
   temp ⟶ next ⟶ prev = new

   temp ⟶ next = new
   return SUCCESS

g_data = 10

n_data = 25

EMERTXE



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   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

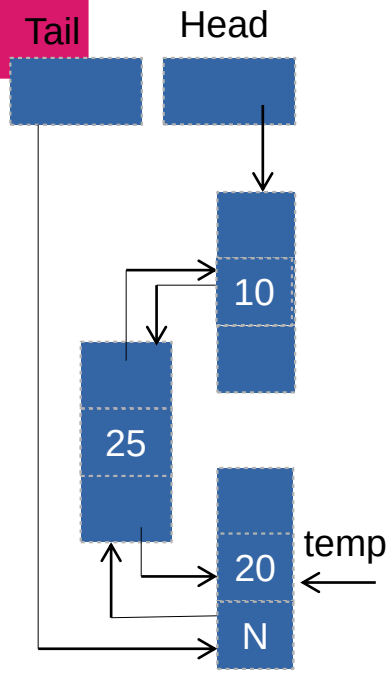
   temp ⟶ next ⟶ prev = new

   temp ⟶ next = new
   return SUCCESS

g_data = 20

n_data = 50

EMERTXE



Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
   3.1 if (temp ⟶ data != g_data)
   temp = temp ⟶ next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE
   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

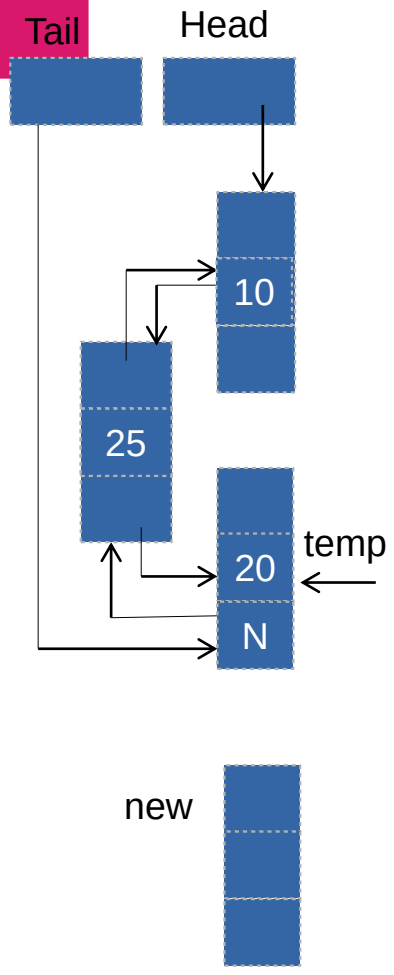
   temp ⟶ next ⟶ prev = new

   temp ⟶ next = new
   return SUCCESS

g_data = 20

n_data = 50

EMERTXE



Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

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   3.1 if (temp ⟶ data != g_data)
   temp = temp ⟶ next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE
   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

   temp ⟶ next ⟶ prev = new

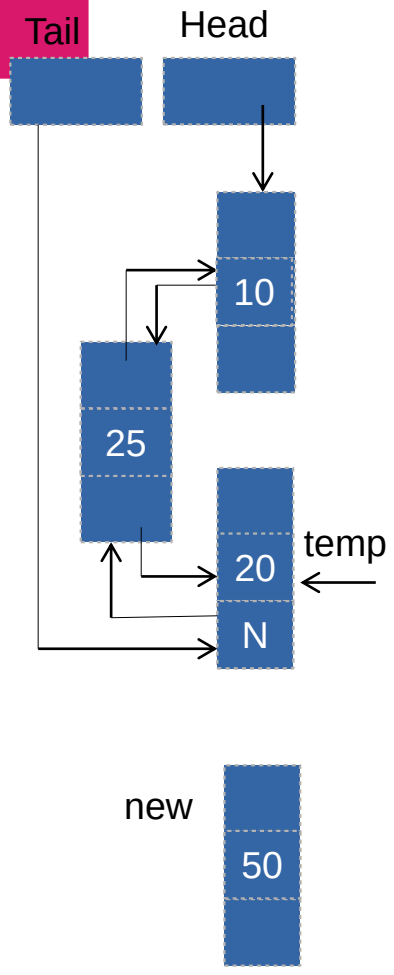
   temp ⟶ next = new
   return SUCCESS

g_data = 20

n_data = 50

EMERTXE

Algorithm
insert_after



Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
   3.1 if (temp ⟶ data != g_data)
   temp = temp ⟶ next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE
   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

   temp ⟶ next ⟶ prev = new

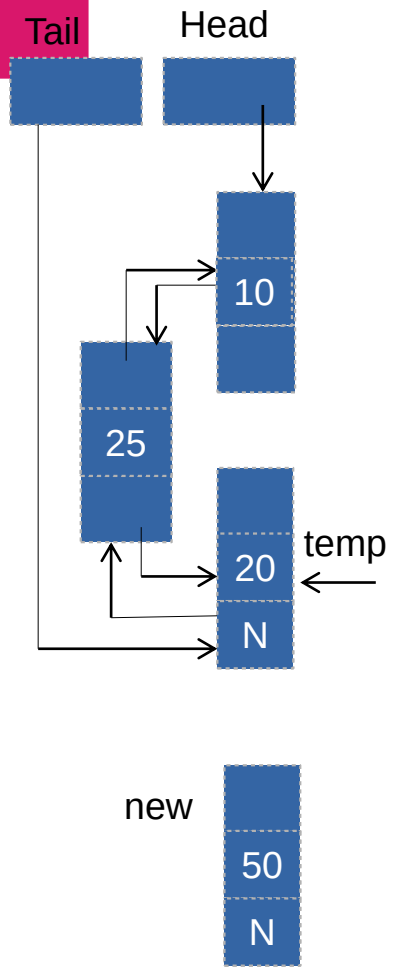
   temp ⟶ next = new
   return SUCCESS

g_data = 20

n_data = 50

EMERTXE

Algorithm
insert_after



Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
   3.1 if (temp ⟶ data != g_data)
   temp = temp ⟶ next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE
   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

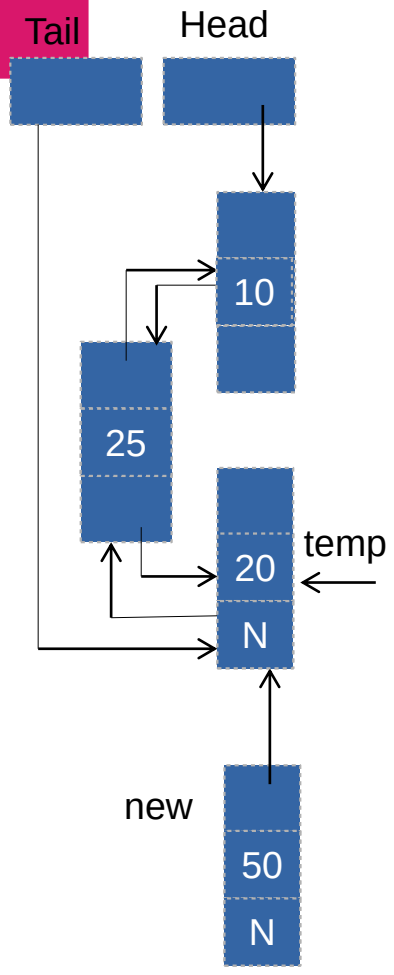
   temp ⟶ next ⟶ prev = new

   temp ⟶ next = new
   return SUCCESS

g_data = 20

n_data = 50

EMERTXE



Algorithm
insert_after

Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
   3.1 if (temp ⟶ data != g_data)
   temp = temp ⟶ next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE
   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp

   temp ⟶ next ⟶ prev = new

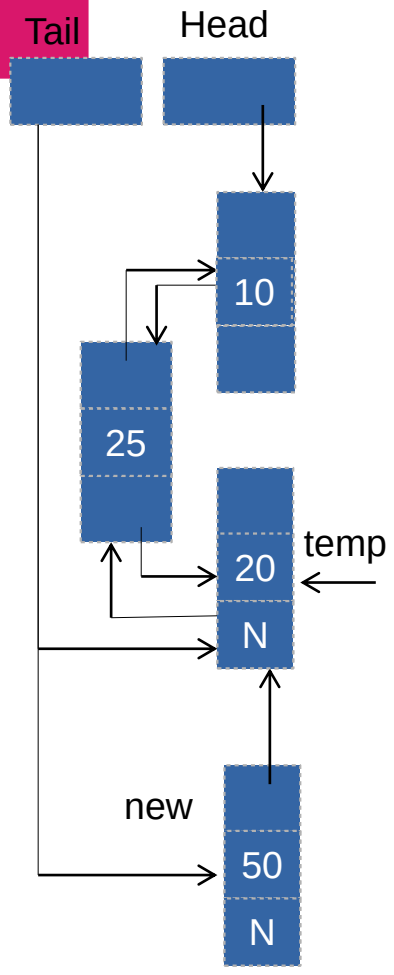
   temp ⟶ next = new
   return SUCCESS

g_data = 20

n_data = 50

EMERTXE

Algorithm
insert_after



Insert_after(Head,Tail,g_data,n_data)

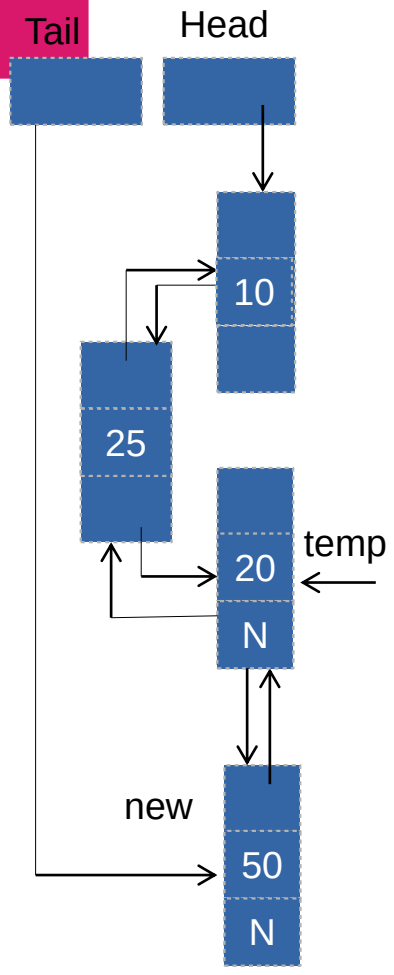
1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
   3.1 if (temp ⟶ data != g_data)
   temp = temp ⟶ next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE
   new ⟶ data = n_data
   new ⟶ next = temp ⟶ next
   new ⟶ prev = temp
   if (temp != Tail)
   temp ⟶ next ⟶ prev = new
   else
   Tail = new
   temp ⟶ next = new
   return SUCCESS

g_data = 20

n_data = 50

EMERTXE

Algorithm
insert_after



Insert_after(Head,Tail,g_data,n_data)

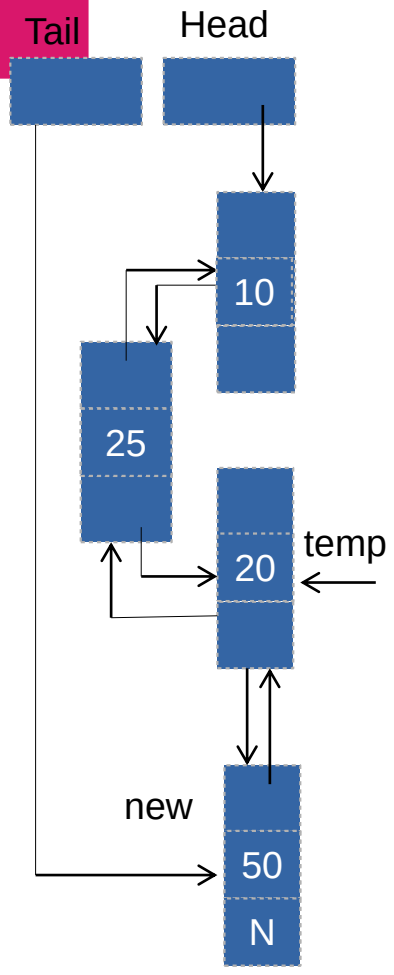
1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
   3.1 if (temp → data != g_data)
   temp = temp → next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE
   new → data = n_data
   new → next = temp → next
   new → prev = temp
   if (temp != Tail)
   temp → next → prev = new
   else
   Tail = new
   temp → next = new
   return SUCCESS

g_data = 20

n_data = 50

EMERTXE

Algorithm
insert_after



Insert_after(Head,Tail,g_data,n_data)

1. if (Head = NULL)
   return LIST_EMPTY
2. temp = Head
3. while (temp != NULL)
   3.1 if (temp → data != g_data)
   temp = temp → next
   3.2 else
   new = Memalloc(sizeof (Dlist))
   if (new = NULL)
   return FAILURE
   new → data = n_data
   new → next = temp → next
   new → prev = temp
   if (temp != Tail)
   temp → next → prev = new
   else
   Tail = new
   temp → next = new
   return SUCCESS
4. return DATA_NOT_FOUND

g_data = 20

n_data = 50

EMERTXE

Double Linked List – Insert after - Code