LAPORAN PRAKTIKUM

PERTEMUAN 6

DOUBLE LINKED LIST BAGIAN 1

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TP

Soal 1: Menambahkan Elemen di Awal dan Akhir DLL

kodenya:

```
soal1.cpp > main()
#include <iostream>
using namespace std;

class Node {
public:
    int data;
    Node* prev;
    Node* next;

    Node(int data) {
        this->data = data;
        this->prev = nullptr;
        this->next = nullptr;
    }
};

class DoublyLinkedList {
private:
    Node* head;
    Node* tail;

public:
    DoublyLinkedList() {
        head = nullptr;
        tail = nullptr;
    }

    void insertFirst_2311104038(int data) {
        Node* newNode = new Node(data);
        if (head == nullptr) {
            head = tail = newNode;
        } else {
            newNode->next = head;
            head->prev = newNode;
            head = newNode;
        }
    }
```

lanjutan kodenya :

```
    void insertLast_2311104038(int data) {
        Node* newNode = new Node(data);
        if (tail == nullptr) {
            head = tail = newNode;
        } else {
            tail->next = newNode;
            newNode->prev = tail;
            tail = newNode;
        }
    }

    void display_2311104038() {
        Node* current = head;
        cout << "DAFTAR ANGGOTA LIST: ";
        while (current != nullptr) {
            cout << current->data;
            current = current->next;
            if (current != nullptr) {
                cout << " <-> ";
            }
        }
        cout << endl;
    }
};

int main() {
    DoublyLinkedList dll;

    dll.insertFirst_2311104038(10);
    dll.insertFirst_2311104038(5);
    dll.insertLast_2311104038(20);

    dll.display_2311104038();

    return 0;
}
```

Dengan contoh input di atas, output yang dihasilkan adalah:

```
PS C:\Users\VICTUS\OneDrive\LAPRAK STD\STD_Ghaza_Zidane_Nurraihan_2311104038\06_Double_linked_List_Bagian1\TP\output> & .\'soal1.exe'
DAFTAR ANGGOTA LIST: 5 <-> 10 <-> 20
PS C:\Users\VICTUS\OneDrive\LAPRAK STD\STD_Ghaza_Zidane_Nurraihan_2311104038\06_Double_linked_List_Bagian1\TP\output>
```

Soal 2 : Menghapus Elemen di Awal dan Akhir DLL

Kodenya :

```cpp
#include <iostream>
using namespace std;

class Node {
public:
    int data;
    Node* prev;
    Node* next;
    Node(int data) : data(data), prev(nullptr), next(nullptr) {}
};

class DoublyLinkedList {
private:
    Node* head;
    Node* tail;

public:
    DoublyLinkedList() : head(nullptr), tail(nullptr) {}

    void insertFirst_2311104038(int data) {
        Node* newNode = new Node(data);
        if (!head) head = tail = newNode;
        else {
            newNode->next = head;
            head->prev = newNode;
            head = newNode;
        }
    }

    void insertLast_2311104038(int data) {
        Node* newNode = new Node(data);
        if (!tail) head = tail = newNode;
        else {
            tail->next = newNode;
            newNode->prev = tail;
            tail = newNode;
        }
    }
```

lanjutan kodenya :

```cpp
    void deleteFirst_2311104038() {
        if (!head) return;
        Node* temp = head;
        if (head == tail) head = tail = nullptr;
        else {
            head = head->next;
            head->prev = nullptr;
        }
        delete temp;
    }

    void deleteLast_2311104038() {
        if (!tail) return;
        Node* temp = tail;
        if (head == tail) head = tail = nullptr;
        else {
            tail = tail->prev;
            tail->next = nullptr;
        }
        delete temp;
    }

    void display_2311104038() {
        Node* current = head;
        cout << "DAFTAR ANGGOTA LIST SETELAH PENGHAPUSAN: ";
        if (!current) cout << "List kosong.";
        while (current) {
            cout << current->data << (current->next ? " <-> " : "");
            current = current->next;
        }
        cout << endl;
    }
};
```

```
int main() {
    DoublyLinkedList dll;
    dll.insertFirst_2311104038(10);
    dll.insertLast_2311104038(15);
    dll.insertLast_2311104038(20);

    dll.deleteFirst_2311104038();
    dll.deleteLast_2311104038();
    dll.display_2311104038();
    return 0;
}
```

Dengan contoh input di atas, output yang dihasilkan adalah:

```
PS C:\Users\VICTUS\OneDrive\LAPRAK STD\STD_Ghaza_Zidane_Nurraihan_2311104038\06_Double_linked_List_Bagian1\TP\output> & .\'soal2.exe'
DAFTAR ANGGOTA LIST SETELAH PENGHAPUSAN: 15
PS C:\Users\VICTUS\OneDrive\LAPRAK STD\STD_Ghaza_Zidane_Nurraihan_2311104038\06_Double_linked_List_Bagian1\TP\output>
```

Soal 3: Menampilkan Elemen dari Depan ke Belakang dan Sebaliknya

```
#include <iostream>
using namespace std;

class Node {
public:
    int data;
    Node* prev;
    Node* next;

    Node(int data) {
        this->data = data;
        this->prev = nullptr;
        this->next = nullptr;
    }
};

class DoublyLinkedList {
private:
    Node* head;
    Node* tail;

public:
    DoublyLinkedList() {
        head = nullptr;
        tail = nullptr;
    }

    void insertLast_2311104038(int data) {
        Node* newNode = new Node(data);
        if (tail == nullptr) {
            head = tail = newNode;
        } else {
            tail->next = newNode;
            newNode->prev = tail;
            tail = newNode;
        }
    }

```

lanjutan kodingannya :

```
    void displayForward_2311104038() {
        Node* current = head;
        cout << "Daftar elemen dari depan ke belakang: ";
        while (current != nullptr) {
            cout << current->data;
            current = current->next;
            if (current != nullptr) cout << " <-> ";
        }
        cout << endl;
    }

    void displayBackward_2311104038() {
        Node* current = tail;
        cout << "Daftar elemen dari belakang ke depan: ";
        while (current != nullptr) {
            cout << current->data;
            current = current->prev;
            if (current != nullptr) cout << " <-> ";
        }
        cout << endl;
    }
};

int main() {
    DoublyLinkedList dll;

    dll.insertLast_2311104038(1);
    dll.insertLast_2311104038(2);
    dll.insertLast_2311104038(3);
    dll.insertLast_2311104038(4);

    dll.displayForward_2311104038();

    dll.displayBackward_2311104038();

    return 0;
}
```

Dengan contoh input di atas, output yang dihasilkan adalah:

```
PS C:\Users\VICTUS\OneDrive\LAPRAK STD\STD_Ghaza_Zidane_Nurraihan_2311104038\06_Double_linked_List_Bagian1\TP\output> & .\'soal3.exe'
Daftar elemen dari depan ke belakang: 1 <-> 2 <-> 3 <-> 4
Daftar elemen dari belakang ke depan: 4 <-> 3 <-> 2 <-> 1
PS C:\Users\VICTUS\OneDrive\LAPRAK STD\STD_Ghaza_Zidane_Nurraihan_2311104038\06_Double_linked_List_Bagian1\TP\output>
```