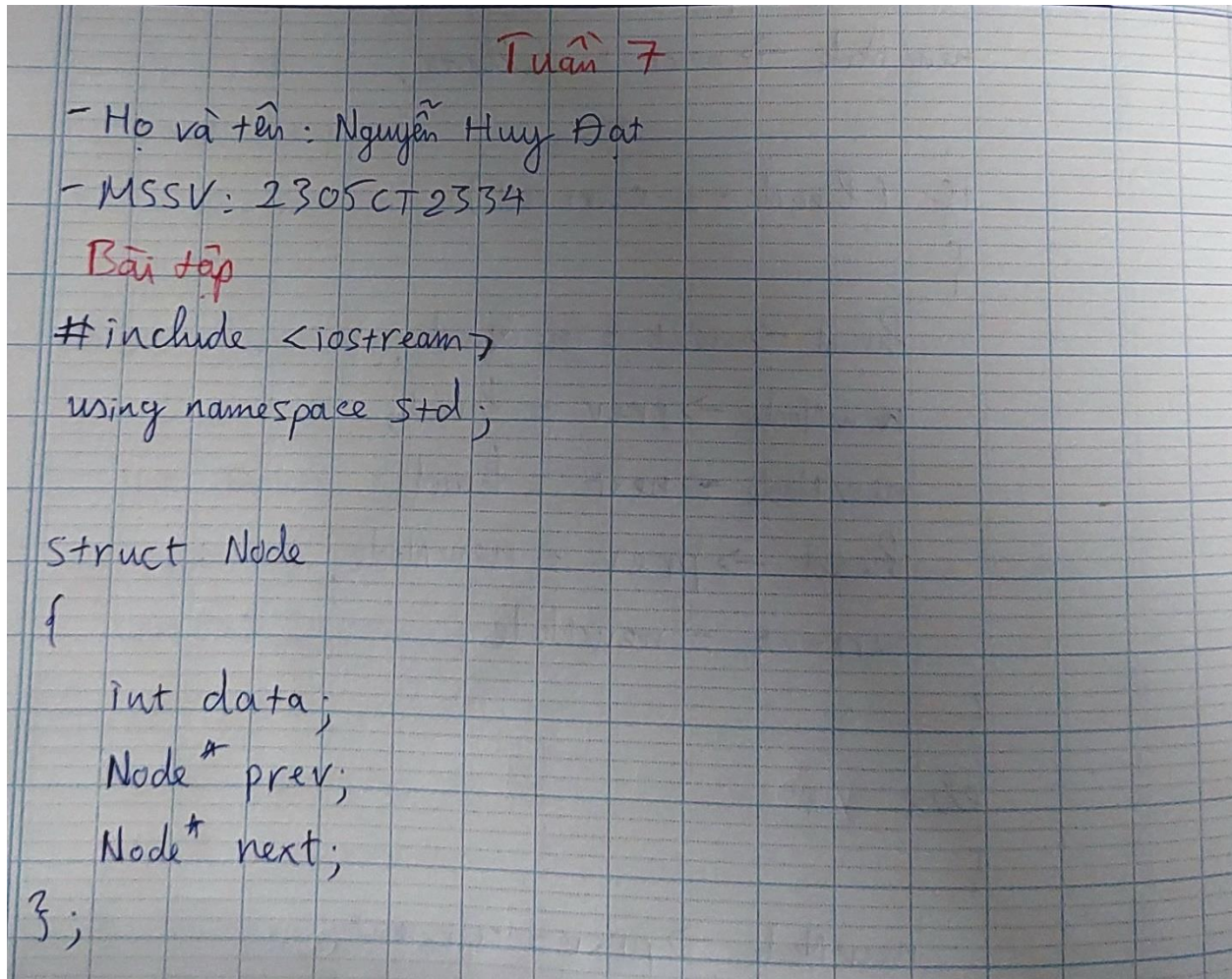Nội dung tuần 7:
Họ và tên: Nguyễn Huy Đạt
MSSV: 2305CT2334

Viết chương trình dùng phương pháp Doubly Linked List.

Cho phép người dùng bấm từ 1 tới 4 thực hiện chức năng sau:

Tuần 7

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Bài tập

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

struct Node
{
    int data;
    Node* prev;
    Node* next;
};
```

```
void TaoDanhSach (Node *& head)
{

    int array [8] = { 8, 7, 9, 1, 2, 12, 10, 4};
    int size = sizeof (array) / size of (array [0]);

    Node *current = head;

    for ( int i = 0; i < size; i++)
    {
        Node *newNode = new Node;
        newNode -> data = array [i];
        newNode -> prev = nullptr;
        newNode -> next = nullptr;

        if ( head == current)
        {
            head -> next = newNode;
            newNode -> prev = head;
            new Node -> next = head;
            head -> prev = newNode;
            current = newNode;
        }
        else
        {
            newNode -> prev = current;
            current -> next = newNode;
```

```cpp
        newNode -> next = head;
        head -> prev = newNode;
        current = newNode;
    }
}

cout << "Da tao thanh cong danh sach." << endl;
Node *to = head -> next;
while (to != head)
{
    cout << to -> data << " ";
    to = to -> next;
}
cout << endl;
}


void TimKiem (Node *& head)
{
    int Input, Index = 1;
    cout << "Xin moi nhap phan tu can tim kiem: ";
    cin >> Input;

    Node *current = head -> next;
    while (current != head)
    {
        if (current -> data == Input)
```

```cpp
    {
        cout << " Da tim thay phan tu " << Input << " tai vi tri "
        << Index << endl;
        return;
    }
    else
    {
        current = current -> next;
        Index ++;
    }
}

cout << " Khong tim thay phan tu " << Input << " trong danh
Sach. " << endl;
}


Void ThemPhanTu ( Node * & head)
{
    int viTri, giaTri;
    cout << " Xin moi nhap vi tri can them vao : ";
    cin >> viTri;
    cout << " Xin moi nhap gia tri can them vao : ";
    cin >> giaTri;

    Node * newNode = new Node;
    newNode -> data = giaTri;
```

```cpp
        Node * current = head;
        int currentIndex ++;
    }



    newNode -> prev = current;
    newNode -> next = current -> next;
    current -> next -> prev = newNode;
    current -> next = newNode;


    cout << " Da them phan tu " << giaTri << " vao vi tri "
    << viTri << endl;


    cout << endl;
}


void XoaPhanTu ( Node *&head)
{

    int viTri;
    cout << " Xin moi nhap vi tri can xoa: ";
    cin >> viTri;


    Node *current = head -> next;
    int currentIndex = 1;


    while (current != head && currentIndex < viTri)
    {
```

```cpp
        current = current ->next;
        currentIndex ++;
    }

    if (current == head)
    {
        cout << " Vi tri can xoa Khong hop le " << endl;
        return;
    }

    current ->prev ->next = current ->next;
    current ->next ->prev = current ->prev;
    delete current ;

    cout << " Da xoa phan tu tai vi tri " << viTri << endl;
}

void XoaTatCa ( Node * &head)
{
    Node *current = head -> next;
    while (current != head)
    {
        Node *temp = current;
        current = current ->next;
        delete temp;
    }
```

```cpp
    head -> prev = head;
    head -> next = head;

    cout << " Da xoa tat ca phan tu trong danh sach" << endl;
}


int main ()
{
    cout << " Xin moi nhap lua chon sau : " << endl;
    cout << " 1. Tao day lien ket." << endl;
    cout << " 2. Tim phan tu trong day." << endl;
    cout << " 3. Them phan tu vao trong day" << endl;
    cout << " 4. Xoa phan tu trong day." << endl;
    cout << " 5. Xoa tat ca phan tu." << endl;

    int option = 6;
    Node * head = new Node;
    head -> prev = head;
    head -> next = head;

    while (option > 5)
    {
        cout << "Xin moi nhap: ";
        cin >> option;
    }
```

```cpp
switch (option)
{
case 1:
    TaoDanhSach (head),
    break;
case 2:
    TaoDanhSach (head);
    cout <<endl;
    TimKiem (head);
    break;
case 3:
    ThemPhanTu (head);
    break;
case 4:
    XoaPhanTu (head);
    break;
case 5:
    XoaTatCa (head);
    break;
default:
    break;
}

delete head;

return 0;
}
```