Assessment Cover Sheet

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ASSESSMENT DETAILS

Unit title	Data Structure and Pattern	Tutorial /Lab Group	1	Office use only
Unit code	COS30008	Due date	28 Oct 2022	
Name of lecturer/tutor	Dr. Mark Tee Kit Tsun			
Assignment title	Problem Set 3			Faculty or school date stamp

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Contents

Task 1

Implementation

Task_1 — Character

```h
#pragma once
#include <iostream>
#include <string>

using namespace std;

class  Character {
private:
    string Name; // store the name of player
    int MaxHp; // store the max hp of player , current hp cnt more than max hp
    int CurrentHp; // store current hp of player
public:
    Character(string t_name,int t_hp); // constructor of character class
    int getMaxHp(); // return max hp of player
    int getCurrentHp(); // return current hp of player
    string getName(); // return name of the player
    void setCurrentHp(int dmg); // calculate current hp of player by passing income dmg
};
```

Task_1 — Character

```cpp
#include "Character.h"

Character::Character(string t_name,int t_hp) {
    Name = t_name;
    MaxHp = t_hp;
    CurrentHp = t_hp;
}

int Character::getMaxHp() {
    return MaxHp;
}

int Character::getCurrentHp() {
    return CurrentHp;
}

string Character::getName() {
    return Name;
}

void Character::setCurrentHp(int dmg) {
    CurrentHp -= dmg;
}
```

Task 2

Implementation

skillNode.h

```h
#pragma once
#include <iostream>
#include <string>

using namespace std;

class SkillNode {
private:
    string Name; // skill name
    int Level; // skill level
    SkillNode* next; // next node
    SkillNode* prev;// previous skill node
public:
    SkillNode(); //constructor of skill node
    SkillNode(string t_name,int t_level); // constructor of skill node with parameter
    int getLevel(); // return level
    string getName(); // return name
    SkillNode* getNextSkillNode(); // return next skill Node
    SkillNode* getPrevSkillNode(); // return prev skill Node
    void setNextSkillNode(SkillNode* temp); // set next skill node
    void setPrevSkillNode(SkillNode* temp); // set prev skill node
    void printDetail(); // print node detail
    void setLevel(int temp); // set node level
    void setName(string temp); // set node name
};
```

SkillNode.cpp

```cpp
Task_1 | SkillNode | getPrevSkillNode
#include "SkillNode.h"

SkillNode::SkillNode() {
    Name = "";
    Level = 0;
    next = NULL;
    prev = NULL;

}

SkillNode::SkillNode(string t_name,int t_level) {
    Name = t_name;
    Level = t_level;
    next = NULL;
    prev = NULL;
}

int SkillNode::getLevel() {
    return Level;
}

string SkillNode::getName() {
    return Name;
}

void SkillNode::setLevel(int temp) {
    Level = temp;
}

void SkillNode::setName(string temp) {
    Name = temp;
}
```

```
28  }
29
30  void SkillNode::setName(string temp) {
31      Name = temp;
32  }
33
34  SkillNode* SkillNode::getNextSkillNode() {
35      return next;
36  }
37
38  SkillNode* SkillNode::getPrevSkillNode() {
39      return prev;
40  }
41
42  void SkillNode::setNextSkillNode(SkillNode* temp) {
43      next = temp;
44  }
45
46  void SkillNode::setPrevSkillNode(SkillNode* temp) {
47      prev = temp;
48  }
49
50  void SkillNode::printDetail() {
51      cout << "Skill Detail" << endl;
52      cout << "Name : " << Name << endl;
53      cout << "Level : " << Level << endl << endl;
54  }
55
```

Task 3

Implementation

Character.h

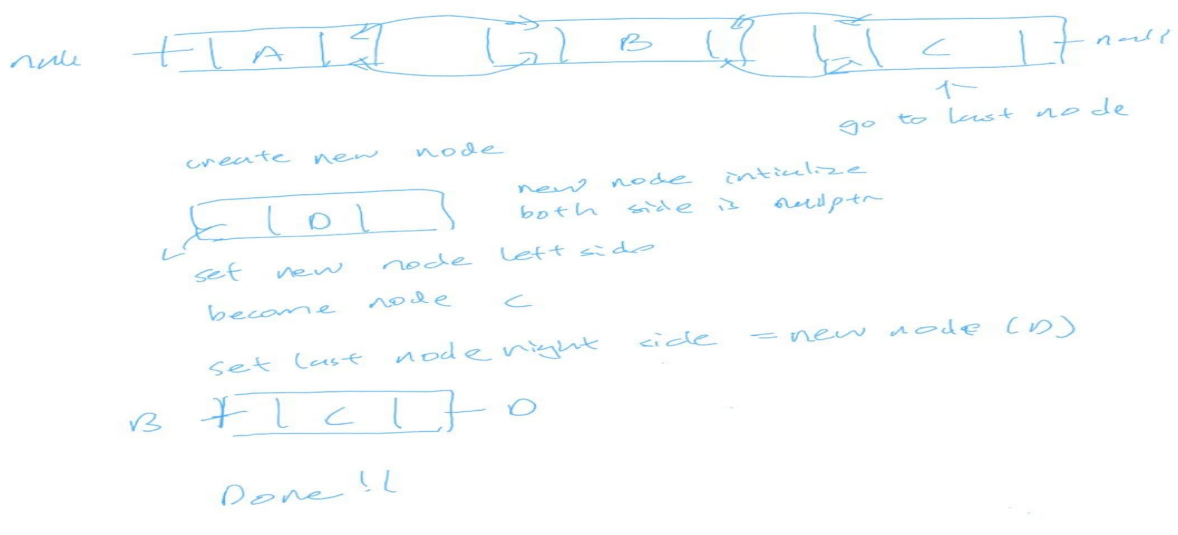
```
main.cpp | SkillNode.h | SkillNode.cpp | Character.h | Character.cpp
Task_1 | Character | PrintAllSkill()
```

```cpp
#pragma once
#include <iostream>
#include <string>
#include "SkillNode.h"


using namespace std;

class  Character {
private:
    string Name; // store the name of player
    int MaxHp; // store the max hp of player , current hp cnt more than max hp
    int CurrentHp; // store current hp of player
    //task 3
    SkillNode* skillNode; //pointerrrrrr of skill Node
public:
    Character(string t_name,int t_hp,SkillNode* s); // constructor of character class
    int getMaxHp(); // return max hp of player
    int getCurrentHp(); // return current hp of player
    string getName(); // return name of the player
    void setCurrentHp(int dmg); // calculate current hp of player by passing income dmg
    //task 3
    void find(string s_name); //task 3 - find skill exist or not
    void add(string s_temp, int s_level); // task 3 - add new skill node
    void remove(string s_name); // task 3 - remove skill node
    void read(); // task 3 - read the content of skill node
    void modify(string temp,string s_name, int s_level); // task 3 - modfify the content of skill node
    void PrintAllSkill(); //
};
```

Character.cpp

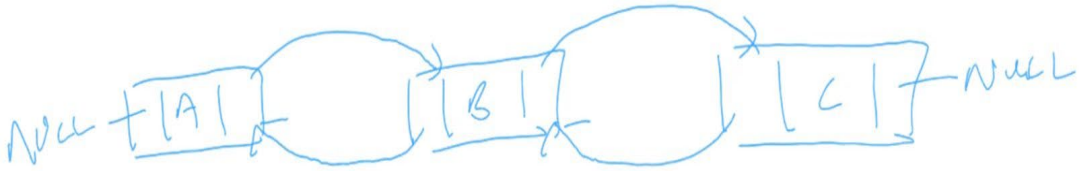
Add

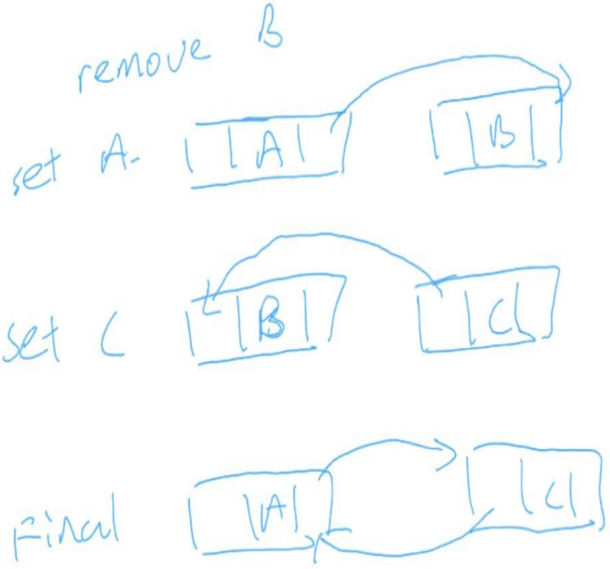
```cpp
void Character::add(string s_temp,int s_level) { // add new skill node
    SkillNode* t_skillNode = *&skillNode; //copy pointer reference
    if (t_skillNode == nullptr) { // if skill node is empty
        skillNode = new SkillNode(s_temp, s_level); // this skill node constructor already initialize prev and next node is null
    }
    else { // if skill node exist something
        while (t_skillNode->getNextSkillNode() != NULL) { // loop until the last skill node
            t_skillNode = t_skillNode->getNextSkillNode();
        }
        SkillNode* temp = new SkillNode(s_temp, s_level); // create new skill node want tp add
        temp->setPrevSkillNode(t_skillNode); // set new skill node prev skill node
        t_skillNode->setNextSkillNode(temp); // insert new skill node to the last skill node

    }
    cout << "\n Successfully create new skill \n" << endl;
}
```



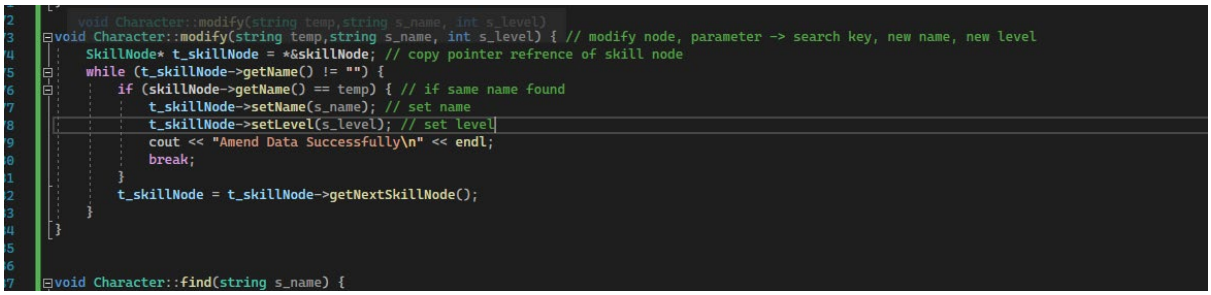
Remove

```
41
42  void Character::remove(string s_name) {
43      SkillNode* t_skillNode = *&skillNode; // create pointer refrence of skill node
44      while (t_skillNode->getName() != "") { // check if not empty
45          if (t_skillNode->getName() == s_name) { // check if name same with selected name
46              if (t_skillNode->getNextSkillNode() == nullptr && t_skillNode->getPrevSkillNode() == nullptr) { //if current node both side (prev,next) is null
47                  skillNode = new SkillNode(); // skill node init to empty
48              }
49              else if (t_skillNode->getPrevSkillNode() == nullptr && t_skillNode->getNextSkillNode() != nullptr) { // if prev is null and next exist, first node
50                  t_skillNode = t_skillNode->getNextSkillNode(); // get next skill node
51                  t_skillNode->setPrevSkillNode(nullptr); //set this node prev is null
52                  skillNode = t_skillNode; // reassign to skill node, now the node become header
53              }
54              else { // below means selected node have previos node
55                  if (t_skillNode->getNextSkillNode() != nullptr) { // if next node exist
56                      t_skillNode->getNextSkillNode()->setPrevSkillNode(t_skillNode->getNextSkillNode()); // set current node's prev node is current node's next node
57                      t_skillNode->getPrevSkillNode()->setNextSkillNode(t_skillNode->getPrevSkillNode()); // set current node's next node is current node's prev node
58                  }
59                  else { // if next node no exist , (in last node)
60                      t_skillNode->getPrevSkillNode()->setNextSkillNode(nullptr);
61                      // set next node to nullptr , this mean current node is last node, so no need to change prev node
62                  }
63              }
64              cout << t_skillNode->getName() << " remove Successfully\n" << endl;
65              read(); // print current double link-list
66              break; // stop while loop and quit
67
68          }
69          t_skillNode = t_skillNode->getNextSkillNode(); // go to next node, if not found same skill name
70      }
71  }
72
```



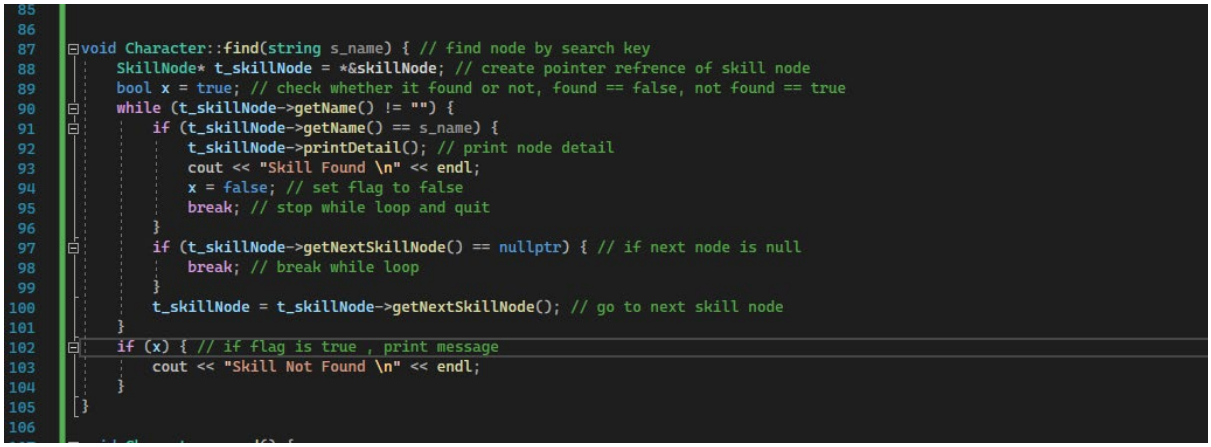


Modify



```
void Character::modify(string temp,string s_name, int s_level) { // modify node, parameter -> search key, new name, new level
    SkillNode* t_skillNode = *&skillNode; // copy pointer refrence of skill node
    while (t_skillNode->getName() != "") {
        if (skillNode->getName() == temp) { // if same name found
            t_skillNode->setName(s_name); // set name
            t_skillNode->setLevel(s_level); // set level
            cout << "Amend Data Successfully\n" << endl;
            break;
        }
        t_skillNode = t_skillNode->getNextSkillNode();
    }
}


void Character::find(string s_name) {
```

Find

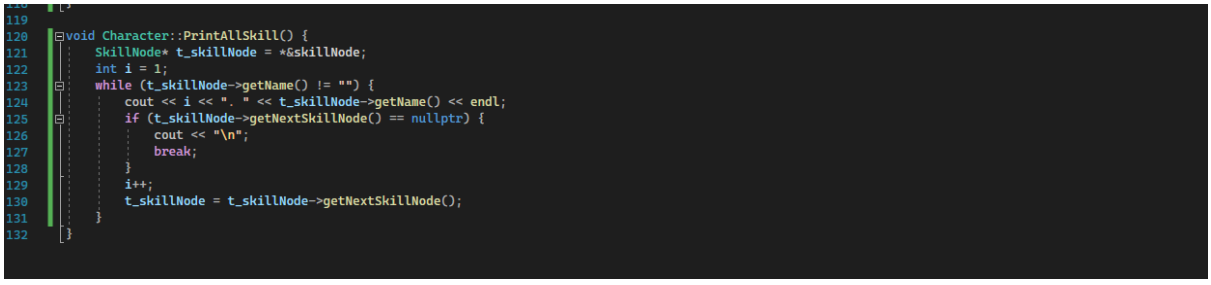


```
void Character::find(string s_name) { // find node by search key
    SkillNode* t_skillNode = *&skillNode; // create pointer refrence of skill node
    bool x = true; // check whether it found or not, found == false, not found == true
    while (t_skillNode->getName() != "") {
        if (t_skillNode->getName() == s_name) {
            t_skillNode->printDetail(); // print node detail
            cout << "Skill Found \n" << endl;
            x = false; // set flag to false
            break; // stop while loop and quit
        }
        if (t_skillNode->getNextSkillNode() == nullptr) { // if next node is null
            break; // break while loop
        }
        t_skillNode = t_skillNode->getNextSkillNode(); // go to next skill node
    }
    if (x) { // if flag is true , print message
        cout << "Skill Not Found \n" << endl;
    }
}
```

Read

```
void Character::read() {
    SkillNode* t_skillNode = *&skillNode;
    while (t_skillNode->getName() != "") {
        cout << t_skillNode->getName();
        if (t_skillNode->getNextSkillNode() == nullptr) {
            cout << "\n";
            break;
        }
        cout << " -> ";
        t_skillNode = t_skillNode->getNextSkillNode();
    }
}
```

Other function created

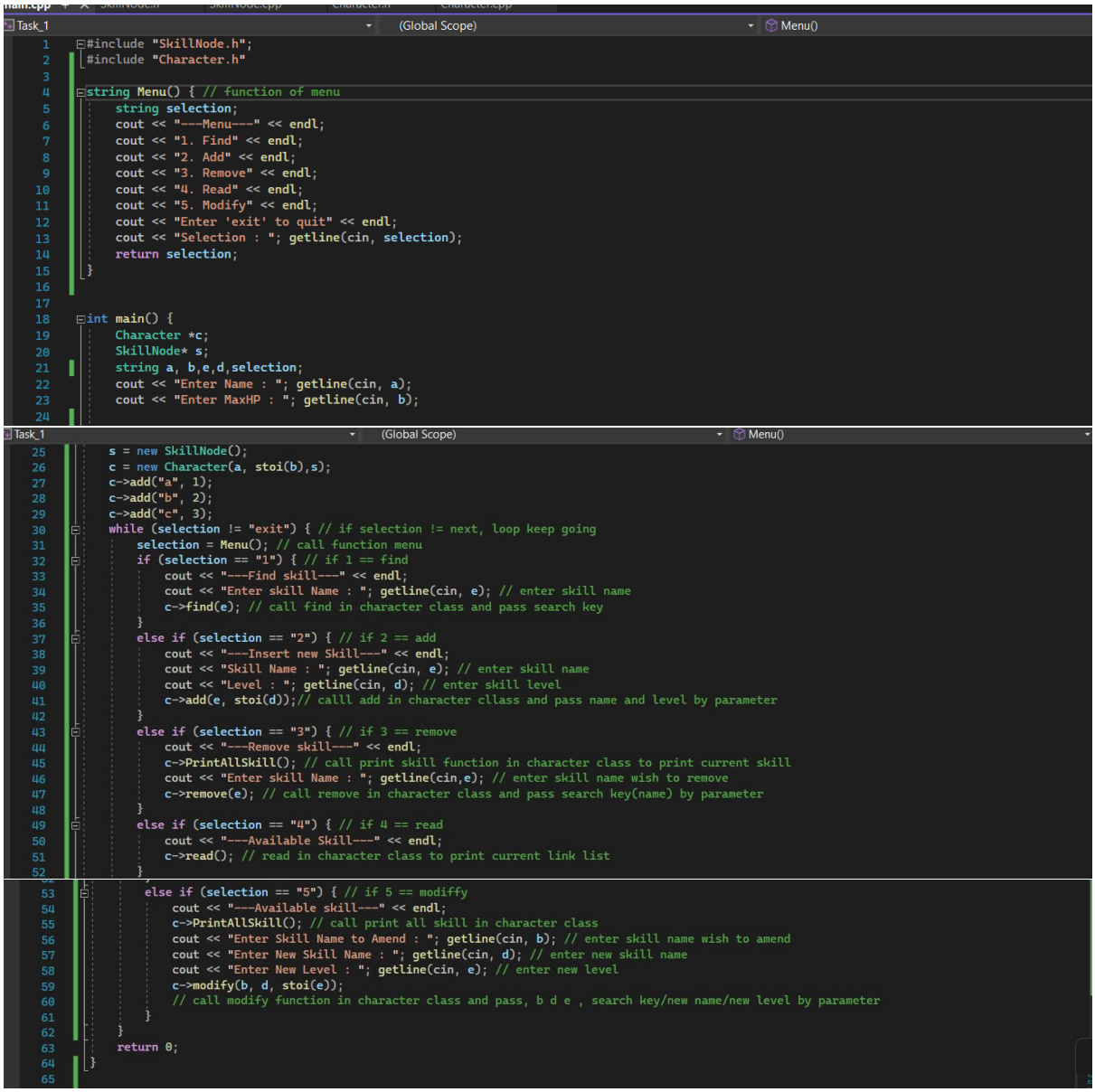


```
void Character::PrintAllSkill() {
    SkillNode* t_skillNode = *&skillNode;
    int i = 1;
    while (t_skillNode->getName() != "") {
        cout << i << ". " << t_skillNode->getName() << endl;
        if (t_skillNode->getNextSkillNode() == nullptr) {
            cout << "\n";
            break;
        }
        i++;
        t_skillNode = t_skillNode->getNextSkillNode();
    }
}
```

Task 4

Implementation

Main.cpp

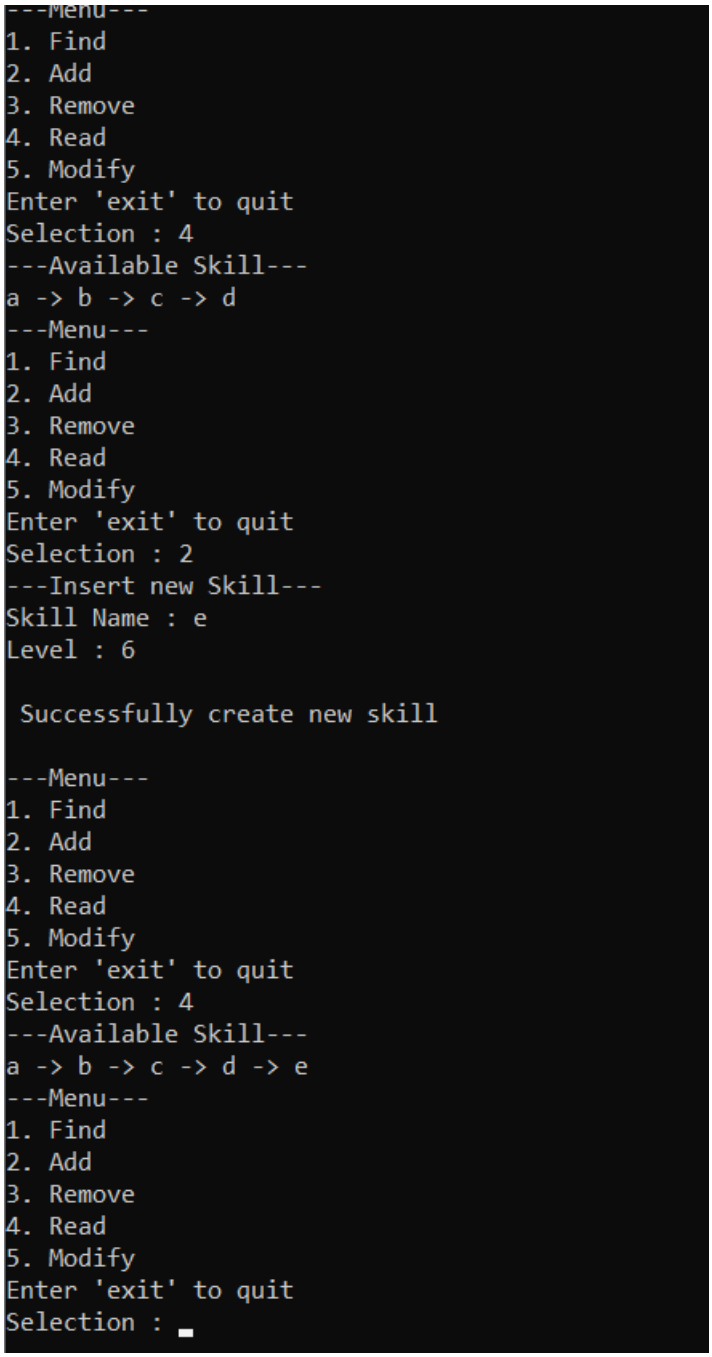


```cpp
#include "SkillNode.h";
#include "Character.h"

string Menu() { // function of menu
    string selection;
    cout << "---Menu---" << endl;
    cout << "1. Find" << endl;
    cout << "2. Add" << endl;
    cout << "3. Remove" << endl;
    cout << "4. Read" << endl;
    cout << "5. Modify" << endl;
    cout << "Enter 'exit' to quit" << endl;
    cout << "Selection : "; getline(cin, selection);
    return selection;
}


int main() {
    Character *c;
    SkillNode* s;
    string a, b,e,d,selection;
    cout << "Enter Name : "; getline(cin, a);
    cout << "Enter MaxHP : "; getline(cin, b);

    s = new SkillNode();
    c = new Character(a, stoi(b),s);
    c->add("a", 1);
    c->add("b", 2);
    c->add("c", 3);
    while (selection != "exit") { // if selection != next, loop keep going
        selection = Menu(); // call function menu
        if (selection == "1") { // if 1 == find
            cout << "---Find skill---" << endl;
            cout << "Enter skill Name : "; getline(cin, e); // enter skill name
            c->find(e); // call find in character class and pass search key
        }
        else if (selection == "2") { // if 2 == add
            cout << "---Insert new Skill---" << endl;
            cout << "Skill Name : "; getline(cin, e); // enter skill name
            cout << "Level : "; getline(cin, d); // enter skill level
            c->add(e, stoi(d));// calll add in character cllass and pass name and level by parameter
        }
        else if (selection == "3") { // if 3 == remove
            cout << "---Remove skill---" << endl;
            c->PrintAllSkill(); // call print skill function in character class to print current skill
            cout << "Enter skill Name : "; getline(cin,e); // enter skill name wish to remove
            c->remove(e); // call remove in character class and pass search key(name) by parameter
        }
        else if (selection == "4") { // if 4 == read
            cout << "---Available Skill---" << endl;
            c->read(); // read in character class to print current link list
        }
        else if (selection == "5") { // if 5 == modiffy
            cout << "---Available skill---" << endl;
            c->PrintAllSkill(); // call print all skill in character class
            cout << "Enter Skill Name to Amend : "; getline(cin, b); // enter skill name wish to amend
            cout << "Enter New Skill Name : "; getline(cin, d); // enter new skill name
            cout << "Enter New Level : "; getline(cin, e); // enter new level
            c->modify(b, d, stoi(e));
            // call modify function in character class and pass, b d e , search key/new name/new level by parameter
        }
    }
    return 0;
}
```

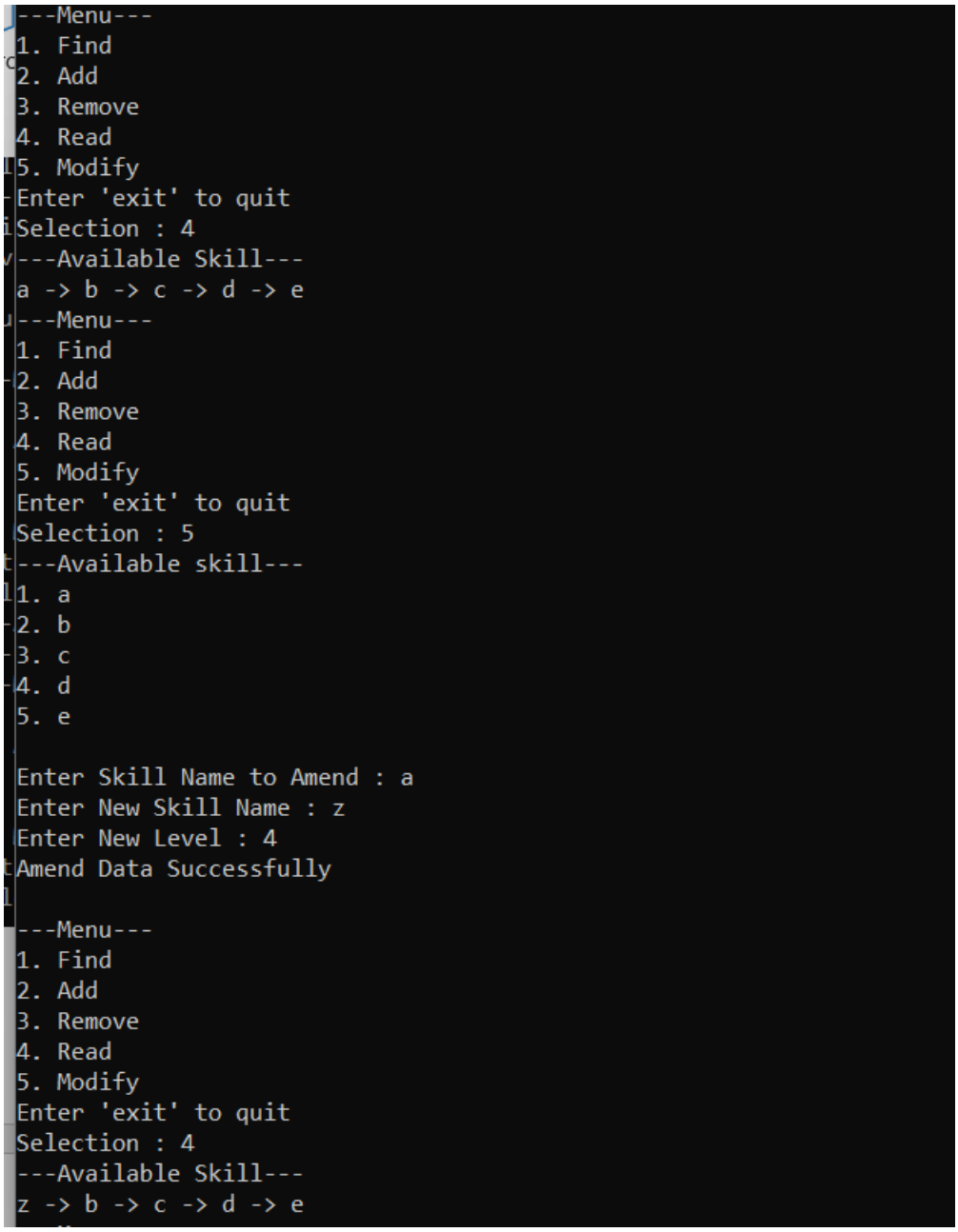
Output

Find

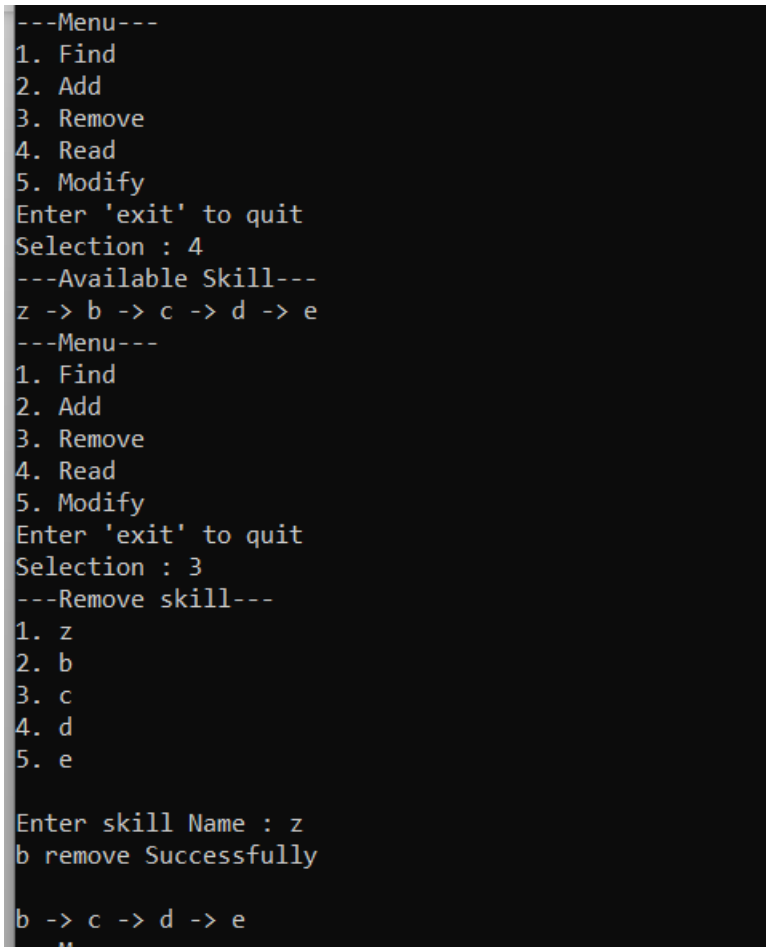
Read and Add



Modify


---Menu---
1. Find
2. Add
3. Remove
4. Read
5. Modify
Enter 'exit' to quit
Selection : 4
---Available Skill---
a -> b -> c -> d -> e
---Menu---
1. Find
2. Add
3. Remove
4. Read
5. Modify
Enter 'exit' to quit
Selection : 5
---Available skill---
1. a
2. b
3. c
4. d
5. e
Enter Skill Name to Amend : a
Enter New Skill Name : z
Enter New Level : 4
Amend Data Successfully
---Menu---
1. Find
2. Add
3. Remove
4. Read
5. Modify
Enter 'exit' to quit
Selection : 4
---Available Skill---
z -> b -> c -> d -> e

Remove

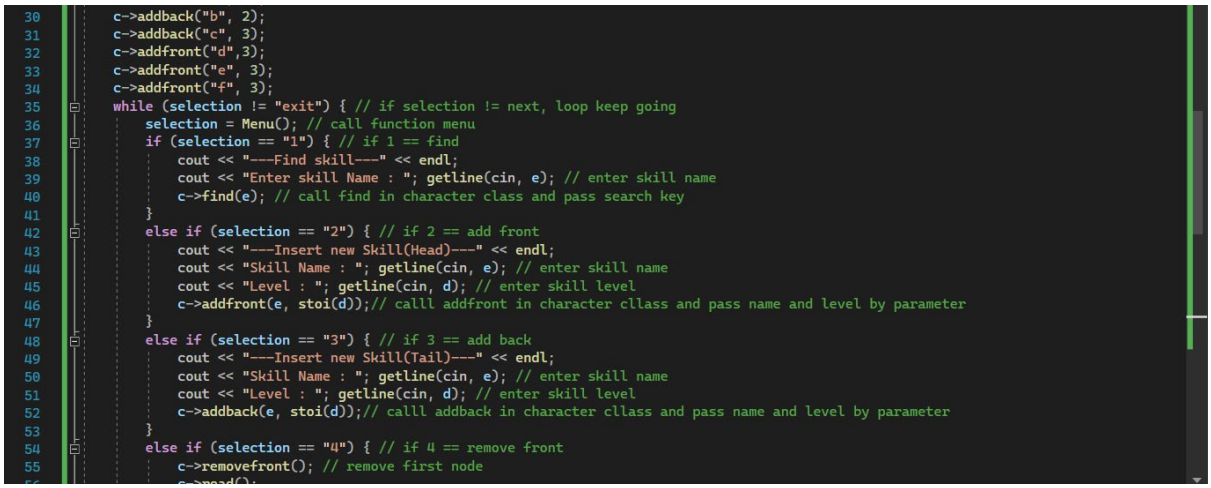

---Menu---
1. Find
2. Add
3. Remove
4. Read
5. Modify
Enter 'exit' to quit
Selection : 4
---Available Skill---
z -> b -> c -> d -> e
---Menu---
1. Find
2. Add
3. Remove
4. Read
5. Modify
Enter 'exit' to quit
Selection : 3
---Remove skill---
1. z
2. b
3. c
4. d
5. e
Enter skill Name : z
b remove Successfully
b -> c -> d -> e

Task 5

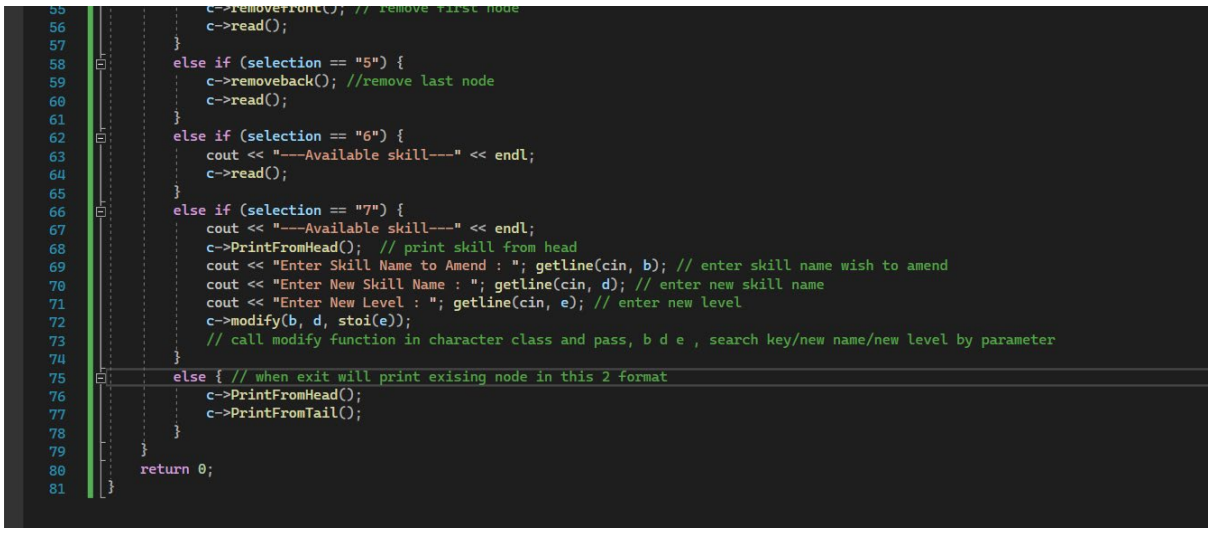
Implementation

Main.cpp

```cpp
#include "Character.h"
#include "SkillList.h"

string Menu() { // function of menu
    string selection;
    cout << "---Menu---" << endl;
    cout << "1. Find" << endl;
    cout << "2. Add head" << endl;
    cout << "3. Add tail" << endl;
    cout << "4. Remove head" << endl;
    cout << "5. Remove Tail" << endl;
    cout << "6. Read" << endl;
    cout << "7. Modify" << endl;
    cout << "Enter 'exit' to quit" << endl;
    cout << "Selection : "; getline(cin, selection);
    return selection;
}


int main() {
    Character* c;
    SkillNode* s;
    string a, b, e, d, selection;
    cout << "Enter Name : "; getline(cin, a);
    cout << "Enter MaxHP : "; getline(cin, b);

    s = new SkillNode();
    c = new Character(a, stoi(b));
    c->addback("a", 1);
```



```cpp
    c->addback("b", 2);
    c->addback("c", 3);
    c->addfront("d",3);
    c->addfront("e", 3);
    c->addfront("f", 3);
    while (selection != "exit") { // if selection != next, loop keep going
        selection = Menu(); // call function menu
        if (selection == "1") { // if 1 == find
            cout << "---Find skill---" << endl;
            cout << "Enter skill Name : "; getline(cin, e); // enter skill name
            c->find(e); // call find in character class and pass search key
        }
        else if (selection == "2") { // if 2 == add front
            cout << "---Insert new Skill(Head)---" << endl;
            cout << "Skill Name : "; getline(cin, e); // enter skill name
            cout << "Level : "; getline(cin, d); // enter skill level
            c->addfront(e, stoi(d));// calll addfront in character cllass and pass name and level by parameter
        }
        else if (selection == "3") { // if 3 == add back
            cout << "---Insert new Skill(Tail)---" << endl;
            cout << "Skill Name : "; getline(cin, e); // enter skill name
            cout << "Level : "; getline(cin, d); // enter skill level
            c->addback(e, stoi(d));// calll addback in character cllass and pass name and level by parameter
        }
        else if (selection == "4") { // if 4 == remove front
            c->removefront(); // remove first node
```



```cpp
            c->read();
        }
        else if (selection == "5") {
            c->removeback(); //remove last node
            c->read();
        }
        else if (selection == "6") {
            cout << "---Available skill---" << endl;
            c->read();
        }
        else if (selection == "7") {
            cout << "---Available skill---" << endl;
            c->PrintFromHead();  // print skill from head
            cout << "Enter Skill Name to Amend : "; getline(cin, b); // enter skill name wish to amend
            cout << "Enter New Skill Name : "; getline(cin, d); // enter new skill name
            cout << "Enter New Level : "; getline(cin, e); // enter new level
            c->modify(b, d, stoi(e));
            // call modify function in character class and pass, b d e , search key/new name/new level by parameter
        }
        else { // when exit will print exising node in this 2 format
            c->PrintFromHead();
            c->PrintFromTail();
        }
    }
    return 0;
}
```

Character.h

```h
#pragma once
#include <iostream>
#include <string>
#include "SkillList.h"

using namespace std;

class  Character {
private:
    string Name; // store the name of player
    int MaxHp; // store the max hp of player , current hp cnt more than max hp
    int CurrentHp; // store current hp of player
    SkillList SL;
public:
    Character(string t_name, int t_hp); // constructor of character class
    int getMaxHp(); // return max hp of player
    int getCurrentHp(); // return current hp of player
    string getName(); // return name of the player
    void setCurrentHp(int dmg); // calculate current hp of player by passing income dmg
    //task 3
    void find(string s_name); //task 3 - find skill exist or not
    void addfront(string s_temp, int s_level); // task 3 - insert node at front
    void addback(string s_temp, int s_level); // task 3 - insert node at back
    void removefront(); // task 3 - remove skill node
    void removeback(); // task 3 - remove skill node
    void read(); // task 3 - read the content of skill node
    void modify(string temp, string s_name, int s_level); // task 3 - modfify the content of skill node
    void PrintFromTail();
    void PrintFromHead();
};

```

Character.cpp

```cpp
void Character::addfront(string s_temp, int s_level) { // call skilllist add front
    SL.addfront(s_temp,s_level);
}

void Character::addback(string s_temp, int s_level) {// call skilllist add back function
    SL.addback(s_temp, s_level);
}

void Character::removefront() { // call skill list remove front function
    SL.removefront();
}

void Character::removeback() { //call skill list remove back function
    SL.removeback();
}

void Character::modify(string temp, string s_name, int s_level) { // call skill list modify function
    SL.modify(temp, s_name, s_level);
}


void Character::find(string s_name) { // call skill list find function
    SL.find(s_name);
}
```

```cpp
void Character::read() { // call skill list read function
    SL.read();
}

void Character::PrintFromTail() { // call skill list read from tail function
    SL.PrintFromTail();
}

void Character::PrintFromHead() {// call skill list read from head function
    SL.PrintFromHead();
}
```

SkillList.h

```h
#pragma once
#include <iostream>
#include <string>
#include "SkillNode.h"

using namespace std;

class SkillList {
private:
    SkillNode* skillNode;
    SkillNode* head;
    SkillNode* tail;
public:
    SkillList();
    void find(string s_name); //task 5 - find skill exist or not
    void addfront(string s_temp, int s_level); // task 5 - add new skill node at first
    void addback(string s_temp, int s_level); // task 5 - add new skill node at last
    void removefront(); // task 5 - remove frsit skill node
    void removeback(); // task 5 - remove last skill node
    void read(); // task 5 - read the content of skill node
    void modify(string temp, string s_name, int s_level); // task 3 - modfify the content of skill node
    void PrintFromTail(); //
    void PrintFromHead();
};
```

SkillList.cpp

Add back

```cpp
#include "SkillList.h"

SkillList::SkillList() {
    head = NULL;
    tail = NULL;
    skillNode = NULL;
}

void SkillList::addback(string s_temp, int s_level) { // add new skill node
    SkillNode* current_tail = *&tail; //create pointer reference of skillnode
    if (current_tail == nullptr) { // if skill node is empty
        skillNode = new SkillNode(s_temp, s_level); // this skill node constructor already initialize prev and next node is null
        head = *&skillNode;// become pointer refrence of skill node
        tail = *&skillNode;// become pointer refrence of skill node
    }
    else { // if skill node exist something
        SkillNode* temp = new SkillNode(s_temp, s_level); // create new skill node want tp add
        temp->setPrevSkillNode(current_tail); // set previous node(new node) is current tail
        current_tail->setNextSkillNode(temp); // set current tail next node is new node
        tail = temp; // new node become tail
    }
    cout << "\n Successfully add new skill at back\n" << endl;
}
```

Add front / remove front

```cpp
void SkillList::addfront(string s_temp, int s_level) {
    SkillNode* current_head = *&head; //create pointer reference of skillnode
    if (current_head == nullptr) { // if skill node is empty
        skillNode = new SkillNode(s_temp, s_level); // this skill node constructor already initialize prev and next node is null
        head = *&skillNode; // become pointer refrence of skill node
        tail = *&skillNode; // become pointer refrence of skill node
    }
    else { // if skill node exist something
        SkillNode* temp = new SkillNode(s_temp, s_level); // create new skill node want to add
        temp->setNextSkillNode(current_head); // set next skill node(new node) is current head
        current_head->setPrevSkillNode(temp); // set current head prev skill node is new skill node
        head = temp; // new skill node become head
    }
    cout << "\n Successfully add new skill at front\n" << endl;
}

void SkillList::removefront() {
    SkillNode* current_head = *&head; // get current head
    if (current_head->getNextSkillNode() != nullptr) { // when more that 2 node
        SkillNode* temp = current_head->getNextSkillNode(); //save current head next node to temp
        temp->setPrevSkillNode(nullptr); // set temp previous node to null
        head = temp; // temp become head
    }
    else { // only 1 node
        skillNode = nullptr;
        head = nullptr;
        tail = nullptr;
    }
}
```

Remove back/ modify

```cpp
void SkillList::removeback() {// when more that 2 node
    SkillNode* current_tail = *&tail; // get current tail
    if (current_tail->getPrevSkillNode() != nullptr) {// when more that 2 node
        SkillNode* temp = current_tail->getPrevSkillNode(); // save current tail prev node to temp
        temp->setNextSkillNode(nullptr); // set temp next node to null
        tail = temp; // temp become tail
    }
    else {// only 1 node
        skillNode = nullptr;
        head = nullptr;
        tail = nullptr;
    }
}

void SkillList::modify(string temp, string s_name, int s_level) { // modify node, parameter -> search key, new name, new level
    SkillNode* t_skillNode = *&skillNode; // copy pointer refrence
    while (t_skillNode->getName() != "") {
        if (skillNode->getName() == temp) { // if same name found
            t_skillNode->setName(s_name); // set name
            t_skillNode->setLevel(s_level); // set level
            cout << "Amend Data Successfully\n" << endl;
            break;
        }
        t_skillNode = t_skillNode->getNextSkillNode();
    }
}
```

Find / read

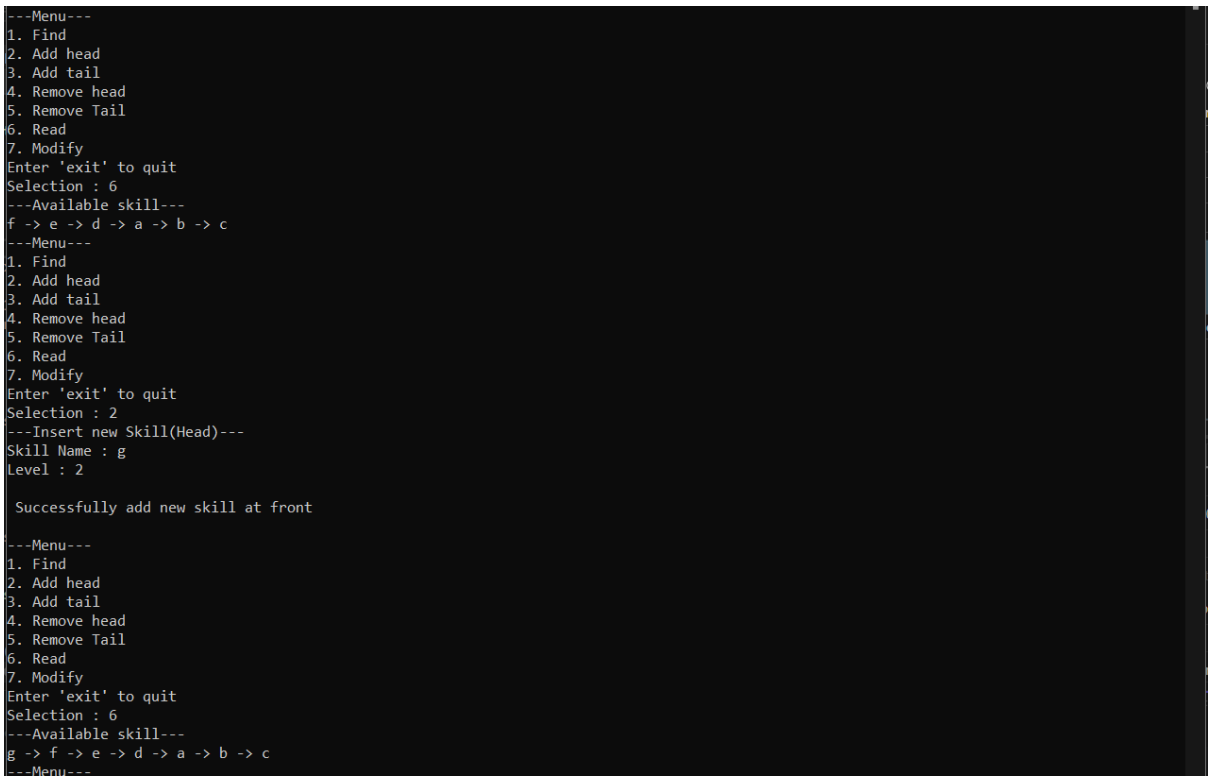
```cpp
void SkillList::find(string s_name) { // find node by search key
    SkillNode* t_skillNode = *&head; // create pointer refrence of head
    bool x = true; // check whether it found or not, found == false, not found == true
    while (t_skillNode->getName() != "") {
        if (t_skillNode->getName() == s_name) {
            t_skillNode->printDetail(); // print node detail
            cout << "Skill Found \n" << endl;
            x = false; // set flag to false
            break; // stop while loop and quit
        }
        if (t_skillNode->getNextSkillNode() == nullptr) { // if next node is null
            break; // break while loop
        }
        t_skillNode = t_skillNode->getNextSkillNode(); // go to next skill node
    }
    if (x) { // if flag is true , print message
        cout << "Skill Not Found \n" << endl;
    }
}

void SkillList::read() {
    SkillNode* t_skillNode = *&head;
    while (t_skillNode->getName() != "") {
        cout << t_skillNode->getName();
        if (t_skillNode->getNextSkillNode() == nullptr) {
            cout << "\n";
            break;
        }
        cout << " -> ";
        t_skillNode = t_skillNode->getNextSkillNode();
    }
}
```

Print from tail/head

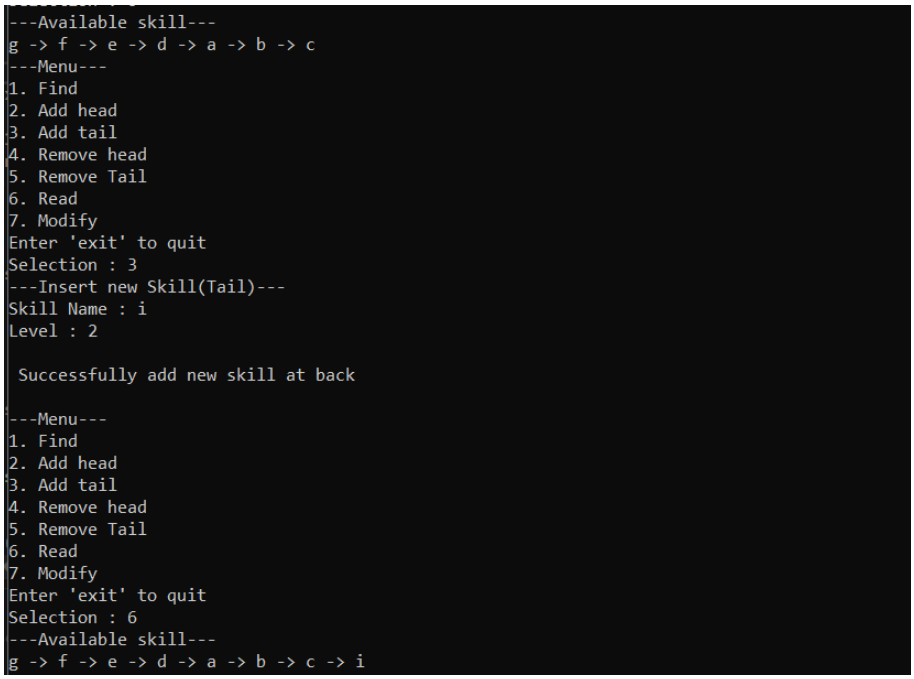
```cpp
void SkillList::PrintFromTail() {
    SkillNode* temp_tail = *&tail;
    int i = 1;
    while (temp_tail->getName() != "") {
        cout << i << ". " << temp_tail->getName() << endl;
        if (temp_tail->getPrevSkillNode() == nullptr) {
            cout << "\n";
            break;
        }
        i++;
        temp_tail = temp_tail->getPrevSkillNode();
    }
}

void SkillList::PrintFromHead() {
    SkillNode* temp_head = *&head;
    int i = 1;
    while (temp_head->getName() != "") {
        cout << i << ". " << temp_head->getName() << endl;
        if (temp_head->getNextSkillNode() == nullptr) {
            cout << "\n";
            break;
        }
        i++;
        temp_head = temp_head->getNextSkillNode();
    }
}
```

Output

Insert front node



Insert back node



Remove head

```
Selection : 6
---Available skill---
g -> f -> e -> d -> a -> b -> c -> i
---Menu---
1. Find
2. Add head
3. Add tail
4. Remove head
5. Remove Tail
6. Read
7. Modify
Enter 'exit' to quit
Selection : 4
f -> e -> d -> a -> b -> c -> i
---Menu---
```

Remove tail

```
f -> e -> d -> a -> b -> c -> i
---Menu---
1. Find
2. Add head
3. Add tail
4. Remove head
5. Remove Tail
6. Read
7. Modify
Enter 'exit' to quit
Selection : 5
f -> e -> d -> a -> b -> c
---Menu---
```

Read

```
---Menu---
1. Find
2. Add head
3. Add tail
4. Remove head
5. Remove Tail
6. Read
7. Modify
Enter 'exit' to quit
Selection : 6
---Available skill---
g -> f -> e -> d -> a -> b -> c
```

Print from tail/head

```
---Menu---
1. Find
2. Add head
3. Add tail
4. Remove head
5. Remove Tail
6. Read
7. Modify
Enter 'exit' to quit
Selection : exit
f -> e -> d -> a -> b -> c
c -> b -> a -> d -> e -> f
```

Modify

```
f -> e -> d -> a -> b -> c
---Menu---
1. Find
2. Add head
3. Add tail
4. Remove head
5. Remove Tail
6. Read
7. Modify
Enter 'exit' to quit
Selection : 7
---Available skill---
1. f
2. e
3. d
4. a
5. b
6. c

Enter Skill Name to Amend : a
Enter New Skill Name : asd
Enter New Level : 2
Amend Data Successfully

---Menu---
1. Find
2. Add head
3. Add tail
4. Remove head
5. Remove Tail
6. Read
7. Modify
Enter 'exit' to quit
Selection : 6
---Available skill---
f -> e -> d -> asd -> b -> c
```

Find

```
---Menu---
1. Find
2. Add head
3. Add tail
4. Remove head
5. Remove Tail
6. Read
7. Modify
Enter 'exit' to quit
Selection : 1
---Find skill---
Enter skill Name : asd
Skill Detail
Name : asd
Level : 2

Skill Found
```