#include<iostream>

using namespace std;

class LinkNode {

public:

int data;

LinkNode\* next;

LinkNode\* random;

LinkNode();

LinkNode(int n) {

data = n;

next = nullptr;

random = nullptr;

}

};

LinkNode\* copy(LinkNode\* head) {

if (head != nullptr) {

LinkNode\* p1 = head;

while (p1) {

LinkNode\* newhead = new LinkNode();

newhead->data = p1->data;

newhead->next = p1->next;

newhead->random = nullptr;

p1->next = newhead;

p1 = newhead->next;

}

p1 = head;

while (p1) {

LinkNode\* p\_next = p1->next;

if (p1->random != nullptr) {

p\_next->random = p1->random->next;

}

p1 = p\_next->next;

}

p1 = head;

LinkNode\* p\_next = nullptr;

LinkNode\* p\_newhead = nullptr;

if (p1 != nullptr) {

p\_newhead = p\_next = p1->next;

p1->next = p\_next->next;

p1 = p\_next->next;

}

while (p1) {

p\_next = p1->next;

p1->next = p\_next->next;

p1 = p\_next->next;

}

return p\_newhead;

}

return nullptr;

}

int main() {

LinkNode\* node1 = new LinkNode(1);

LinkNode\* node2 = new LinkNode(2);

LinkNode\* node3 = new LinkNode(3);

LinkNode\* node4 = new LinkNode(4);

node1->next = node2;

node2->next = node3;

node3->next = node4;

node1->random = node4;

node2->random = node3;

node3->random = node2;

node4->random = node1;

LinkNode\* head = node1;

LinkNode\* q = head;

while (q) {

if (q != nullptr) {

cout << "(" << q->data << "," << q->random->data << ")" << "->";

q = q->next;

}

}

cout << endl;

q = head;

LinkNode\* q1 = copy(q);

while (q1) {

if (q1 != nullptr) {

cout << "(" << q1->data << "," << q1->random->data << ")" << "->";

q1 = q1->next;

}

}

}