

Research Project 3:

Student II

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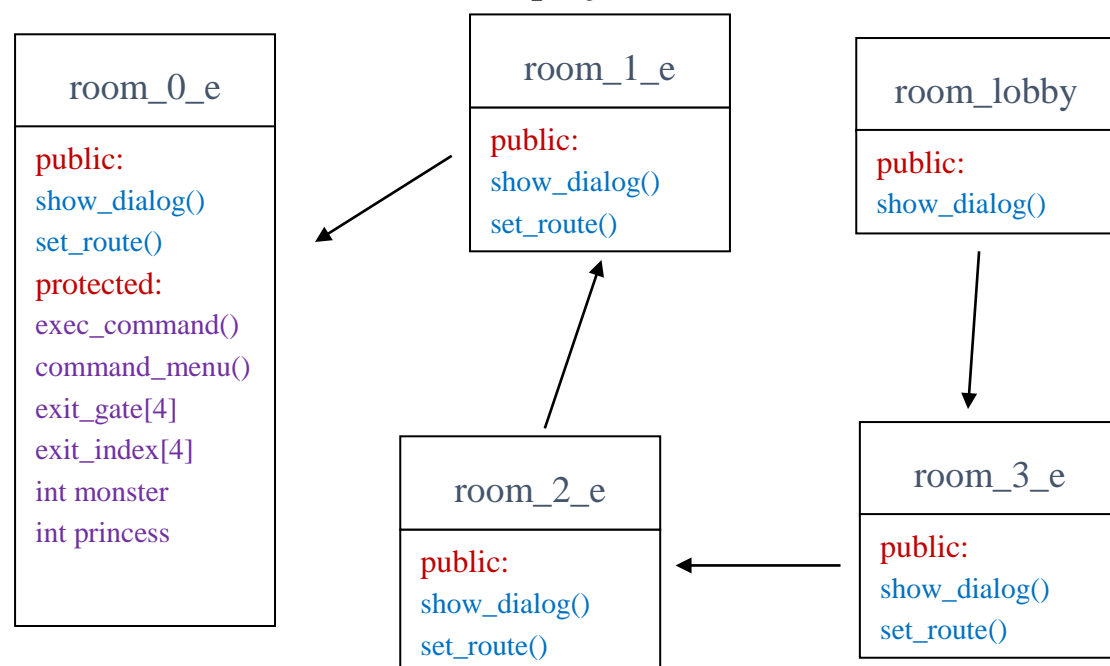
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Chapter 1: Introduction

Adventure is a CLI game. The player has to explore in the castle with many levels and a lot of rooms. The task of the player is to find a room where the princess is prinsoned and take her leave the castle. There are many types of rooms, and each type of room has different types of exits. Note that there's a monster in one of the rooms, which the exact location is not able to be aware. But once the player meets a monster, the game is over.

Chapter 2: Coding Specification

I. Class and inheritance in this project:



II. Source Code

(1) room.h

```
#ifndef ROOM_H
#define ROOM_H
#include <string>
#include <iostream>
using namespace std;

class room_0_E //room with only one exit
{
public:
    room_0_E(int direction=0,int mon=0,int prin=0); //set monster
    ~room_0_E(); //and princess to 0 by default
};
```

```

        virtual bool show_dialog(); //show the dialog of this room
        virtual void set_route(room_0_E* room);/*specify the connection
with other room*/
protected:
        virtual bool exec_command(string command);//execution of command
        void command_menu();           //show the command guide menu
        int exit_index[4]; //indicate which of the four directions has road
        room_0_E* exit_gate[4]; //record the next room's address if exist
        int monster;//==1 if there is a monster
        int princess;//==1 if there is a princess
};
#endif

```

(2) room.cpp

```

#include "room.h"

extern int princess_encounter;
room_0_E::room_0_E(int direction,int mon,int prin)
{
    monster=princess=0;
    int i;
    for(i=0;i<4;i++)
        exit_index[i]=0;
    exit_index[direction]=1;
    if(mon)
        monster=1;
    if(prin)
        princess=1;
}

bool room_0_E::show_dialog()
{
    if(!monster&&!princess)
    {
        cout<<"Welcome to the deadend,There are 1 exit please go back, which
is:";
        command_menu();
    }
    else
    {
        if(princess)
        {
            princess_encounter=1;

```

```

        cout<<"You have found the princess, please take her back to
lobby"<<endl;
        cout<<"Welcome to the deadend,There are 1 exit please go back,
which is:";
        command_menu();
    }
    else
        return false;
}
}

bool room_0_E::exec_command(string command)
{
    room_0_E* direction_index;
    if(command=="go east")
    {
        if(!exit_index[0])
        {cout<<"path not exist"<<endl;
        return false;}
        else
        {exit_gate[0]->show_dialog();
        return true;}
    }
    else if(command=="go north")
    {
        if(!exit_index[1])
        {cout<<"path not exist"<<endl;
        return false;}
        else
        {exit_gate[1]->show_dialog();
        return true;}
    }
    else if(command=="go west")
    {
        if(!exit_index[2])
        {cout<<"path not exist"<<endl;
        return false;}
        else
        {exit_gate[2]->show_dialog();
        return true;}
    }
    else if(command=="go south")
    {
        if(!exit_index[3])

```

```

        {cout<<"path not exist"<<endl;
          return false;}
        else
        {exit_gate[3]->show_dialog();
          return true;}
    }
    else
    {
        cout<<"don't know what you are saying"<<endl;
        return false;
    }
}

void room_0_E::set_route(room_0_E *room)
{
    int i;
    for(i=0;i<4;i++)
        if(exit_index[i]!=0)
            exit_gate[i]=room;
}

void room_0_E::command_menu()
{
    if(exit_index[0]==1)
        cout<<"east ";
    if(exit_index[1]==1)
        cout<<"north ";
    if(exit_index[2]==1)
        cout<<"west ";
    if(exit_index[3]==1)
        cout<<"south ";
    cout<<endl;
    cout<<"Enter your command:";
    string command;
    getline(cin,command);
    while(!exec_command(command))
    {
        cout<<"Enter your command again:";
        getline(cin,command);
    }
}

```

(3) room_1_e.h

```
#ifndef ROOM_1_E_H
#define ROOM_1_E_H
#include "room.h"

class room_1_E:public room_0_E //room with two exit
{
    //inherit room_0_E
public:
    room_1_E(int direction_1=1,int direction=0,int mon=0,int prin=0);
    virtual bool show_dialog()//override function show_dialog
    virtual void set_route(room_0_E* room,room_0_E* room1);
    //override function set_route
protected:
};

#endif
```

(4) room_1_e.cpp

```
#include "room_1_e.h"

extern int princess_encounter;
room_1_E::room_1_E(int direction_1,int direction,int mon,int prin):room_0_E(direction,mon,prin)
{
    exit_index[direction_1]=1;
}

bool room_1_E::show_dialog()
{
    if(!monster&&!princess)
    {
        cout<<"Welcome to the room_1_E. There are 2 exits as:";
        command_menu();
    }
    else
    {
        if(princess)
        {
            princess_encounter=1;
            cout<<"You have found the princess, please take her back to lobby"<<endl;
            cout<<"Welcome to the room_1_E. There are 2 exits as:";
            command_menu();
        }
    }
}
```

```

    }
    else
        return false;
    }
}

void room_1_E::set_route(room_0_E *room, room_0_E *room1)
{
    room_0_E* tmp[2];
    tmp[0]=room;
    tmp[1]=room1;
    int i;
    int j=0;
    for(i=0;i<4;i++)
        if(exit_index[i]!=0)
        {
            exit_gate[i]=tmp[j];
            j++;
        }
}

```

(5) room_2_e.h

```

#ifndef ROOM_2_E_H
#define ROOM_2_E_H
#include "room_1_e.h"

class room_2_E:public room_1_E //room with three exit
{
    //inherit room_1_E
public:
    room_2_E(int direction_2=2,int direction_1=1,int direction=0,int
mon=0,int prin=0);
    virtual bool show_dialog();
    virtual void set_route(room_0_E* room,room_0_E* room1,room_0_E*
room2);
};
#endif

```

(6) room_2_e.cpp

```

#include "room_2_e.h"

extern int princess_encounter;

room_2_E::room_2_E(int direction_2,int direction_1,int direction,int

```

```

mon,int prin):room_1_E(direction_1,direction,mon,prin)
{
    exit_index[direction_2]=1;
}

bool room_2_E::show_dialog()
{
    if(!monster&&!princess)
    {
        cout<<"Welcome to the room_2_E. There are 3 exits as:";
        command_menu();
    }
    else
    {
        if(princess)
        {
            princess_encounter=1;
            cout<<"You have found the princess, please take her back to
lobby"<<endl;
            cout<<"Welcome to the room_2_E. There are 3 exits as:";
            command_menu();
        }
        else
            return false;
    }
}

```

(7) room_3_e.h

```

#ifndef ROOM_3_E_H
#define ROOM_3_E_H
#include "room_2_e.h"

class room_3_E:public room_2_E //room with four exit
{
    //inherit room_2_E
public:
    room_3_E(int direction_3=3,int direction_2=2,int direction_1=1,int
direction=0,int mon=0,int prin=0);
    virtual bool show_dialog();
    virtual void set_route(room_0_E* room,room_0_E* room1,room_0_E*
room2,room_0_E* room3);
};
#endif

```


(8) room_3_e.cpp

```
#include "room_3_e.h"

extern int princess_encounter;
room_3_E::room_3_E(int direction_3,int direction_2,int direction_1,int
direction,int                                     mon,int
prin):room_2_E(direction_2,direction_1,direction,mon,prin)
{
    exit_index[direction_3]=1;
}

bool room_3_E::show_dialog()
{
    if(!monster&&!princess)
    {
        cout<<"Welcome to the room_3_E. There are 4 exits as:";
        command_menu();
    }
    else
    {
        if(princess)
        {
            princess_encounter=1;
            cout<<"You have found the princess, please take her back to
lobby"<<endl;
            cout<<"Welcome to the room_3_E. There are 4 exits as:";
            command_menu();
        }
        else
            return false;
    }
}
```

(9) room_lobby.h

```
#ifndef ROOM_LOBBY_H
#define ROOM_LOBBY_H

#include "room_3_e.h"

class room_lobby:public room_3_E //lobby room with four exit
{
    //inherit room_3_E
public:
    room_lobby(int                direction_3=3,int                direction_2=2,int
```

```

direction_1=1,int direction=0,int mon=0,int prin=0);
    virtual bool show_dialog();
};

#endif

```

(10) Room_lobby.cpp

```

#include "room_lobby.h"

extern int princess_encounter;
extern int princess_saved;

room_lobby::room_lobby(int direction_3,int direction_2,int
direction_1,int direction,int mon,int
prin):room_3_E(direction_3,direction_2,direction_1,direction,mon,prin)
{

}

bool room_lobby::show_dialog()
{
    if(princess_encounter)
    {
        cout<<"congradulations! you have saved the princess!"<<endl;
        princess_saved=1;
        return true;
    }
    else
    {
        cout<<"Welcome to the lobby. There are 3 exits as:";
        command_menu();
    }
    return true;
}

```

(11) main.cpp

```

#include <iostream>
#include <cstdlib>
#include "room.h"
#include "room_1_e.h"
#include "room_2_e.h"
#include "room_3_e.h"
#include "room_lobby.h"
#include "time.h" /*需引用的头文件*/

```

```

#define east 0
#define north 1
#define west 2
#define south 3
using namespace std;

int princess_saved;
int princess_encounter;
room_lobby* map()//create a map
{
    room_3_E *r4;
    room_2_E *r3;
    room_2_E *r2,*r1b;
    room_1_E *r1a,*r1c;
    room_0_E *r2a,*r2b,*r2c,*r4a,*r4b;
    room_lobby *lobby;
    int monst[11];
    int princ[11];
    int i,j;
    for(i=0;i<10;i++)
    {
        monst[i]=princ[i]=0;
    }

    while(1)
    {
        srand((unsigned)time(NULL)); /*random seed*/
        i=rand()%11; /* randomly choose two different room*/
        j=rand()%11;
        if(i!=j)
            break;
    }
    monst[i]=1;//put monster in one room
    princ[j]=1;//put princess in another room
//specify the map, indicate the connections
    r4=new room_3_E(0,1,2,3,monst[0],princ[0]);
    r3=new room_2_E(east,north,west,monst[1],princ[1]);
    r2=new room_2_E(north,west,south,monst[2],princ[2]);
    r1b=new room_2_E(east,south,west,monst[3],princ[3]);
    r1a=new room_1_E(west,south,monst[4],princ[4]);
    r1c=new room_1_E(east,north,monst[5],princ[5]);
    r2a=new room_0_E(west,monst[6],princ[6]);
    r2b=new room_0_E(east,monst[7],princ[7]);

```

```

r2c=new room_0_E(north,monst[8],princ[8]);
r4a=new room_0_E(south,monst[9],princ[9]);
r4b=new room_0_E(east,monst[10],princ[10]);
lobby=new room_lobby;

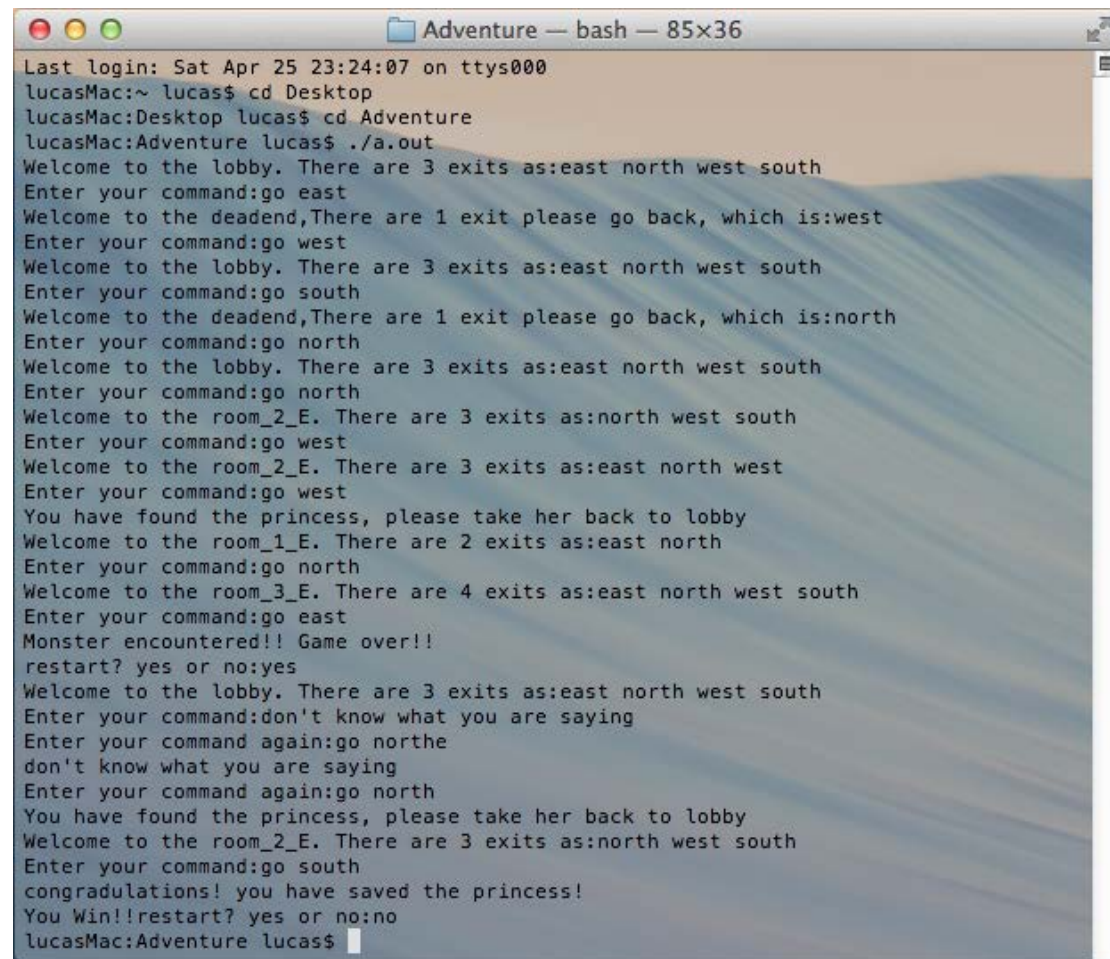
r4->set_route(r1b,r4a,r4b,r1c);
r3->set_route(r2,r1b,r1c);
r2->set_route(r1a,r3,lobby);
r1a->set_route(r1b,r2);
r1b->set_route(r1a,r4,r3);
r1c->set_route(r3,r4);
r2a->set_route(lobby);
r2b->set_route(lobby);
r2c->set_route(lobby);
r4a->set_route(r4);
r4b->set_route(r4);
lobby->set_route(r2a,r2,r2b,r2c);

return lobby;
}

int main()
{
    room_lobby* lobby;
    while(1)
    {
        lobby=map();
        if(lobby->show_dialog()&&!princess_saved)//if returned failed
            cout<<"Monster encountered!! Game over!!"<<endl;
        else if(princess_saved)//if saved you win
            cout<<"You Win!!";
        cout<<"restart? yes or no:";
        string option;
        cin>>option;
        if(option=="yes")
            princess_encounter=0;
        else if(option=="no")
            break;
    }
    return 0;
}

```

Chapter 3: Testing Results



```
Adventure — bash — 85x36
Last login: Sat Apr 25 23:24:07 on ttys000
lucasMac:~ lucas$ cd Desktop
lucasMac:Desktop lucas$ cd Adventure
lucasMac:Adventure lucas$ ./a.out
Welcome to the lobby. There are 3 exits as: east north west south
Enter your command: go east
Welcome to the deadend, There are 1 exit please go back, which is: west
Enter your command: go west
Welcome to the lobby. There are 3 exits as: east north west south
Enter your command: go south
Welcome to the deadend, There are 1 exit please go back, which is: north
Enter your command: go north
Welcome to the lobby. There are 3 exits as: east north west south
Enter your command: go north
Welcome to the room_2_E. There are 3 exits as: north west south
Enter your command: go west
Welcome to the room_2_E. There are 3 exits as: east north west
Enter your command: go west
You have found the princess, please take her back to lobby
Welcome to the room_1_E. There are 2 exits as: east north
Enter your command: go north
Welcome to the room_3_E. There are 4 exits as: east north west south
Enter your command: go east
Monster encountered!! Game over!!
restart? yes or no: yes
Welcome to the lobby. There are 3 exits as: east north west south
Enter your command: don't know what you are saying
Enter your command again: go northe
don't know what you are saying
Enter your command again: go north
You have found the princess, please take her back to lobby
Welcome to the room_2_E. There are 3 exits as: north west south
Enter your command: go south
congradulations! you have saved the princess!
You Win!! restart? yes or no: no
lucasMac:Adventure lucas$
```

Declaration

We hereby declare that all the work done in this project titled "World's Richest" is of my independent effort.