

Please refer to the code here to answer the questions below:

<http://geofhagopian.net/CS007B/cs7b-f17/classcode/Chapter18/wumpus.zip>

1. Consider the `Cave` class interface from the Wumpus game:

```
1 class Cave {
2     public:
3         Cave();
4         Room* get_player_loc();
5         Room* get_wumpus_loc();
6         bool move_player(int lbl);
7         void hazard_warnings();
8         void room_description();
9         void bat_flight();
10        void wake_wumpus();
11        Game_state shoot_arrow();
12    private:
13        vector<Room> rooms;
14        Player plr;
15        Wumpus wmp;
16        Room* lbl_to_ptr(int lbl); // convert label to Room ptr
17};
```

How would you change this class definition so that we would not be using the `vector<Room>`, but a `Room*` instead? (note that it's `Room*` and not `Room**`, as was originally mistakenly written.)

2. What change in the initiator list for the `cave()` constructor definition would this entail?

```
Cave::Cave() : rooms(20), plr(0), wmp(0) {/** body */ }
```

3. The `cave()` constructor definition also contains two `vector<int>` objects: `labels` and `room_no`. Modify the code so that those are `int*` objects. You will need to modify `fisher_Yates_shuffle()` too. Write out the code for your changes here.

4. The `struct Room` is designed using a vector of pointers to `Room`:

```
1 // a room in the cave
2 struct Room {
3     Room();
4     Room(int n, Room* nxt0, Room* nxt1, Room* nxt2);
5     int label;
6     vector<Room*> next;
7     bool has_pit;
8     bool has_bat;
9};
```

Modify this code to use a pointer to a pointer to Room instead:

5. This change to the `struct Room` will require other changes, to make it work.

(a) In particular, how would

```
1 Room::Room(int n, Room* nxt0, Room* nxt1, Room* nxt2)
  : label(n), next(3), has_pit(false), has_bat(false)
3 {
  next[0] = nxt0;
  next[1] = nxt1;
  next[2] = nxt2;
7 }
```

need to be modified?

(b) How would

```
1 bool contains(vector<Room*> v, Room* x) {
  for (int i = 0; i < v.size(); ++i) {
  3     if (v[i] == x) return true;
  }
  5 return false;
}
```

need to be modified?