

고급프로그래밍및실습 과제 #4

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문제 #8

- Book 클래스: 관리번호(number), 제목(title), 저자(author)
- Novel, Poet, ScienceFiction 클래스: Book 상속
- getLateFees(int delayed) 구현
 - Novel: 300원/일, Poet: 200원/일, ScienceFiction: 600원/일

답안

```
1  #include "bits/stdc++.h"
2
3  class Book {
4  private:
5      int number;
6      string title;
7      string author;
8  public:
9      int get_number() { return number; }
10     void set_number(int value) { number = value; }
11
12     string get_title() { return title; }
13     void set_title(string value) { title = value; }
14
15     string get_author() { return author; }
16     void set_author(string value) { author = value; }
17
18     bool operator==(const Book &other) const {
19         return this->number == other.number;
20     }
21
22     virtual int getLateFees(int delayed) = 0;
23     virtual ~Book() {};
24 };
25
26 class Novel: public Book {
27 public:
28     int getLateFees(int delayed) { return 300 * delayed; }
29 };
30 class Poet: public Book {
31 public:
32     int getLateFees(int delayed) { return 200 * delayed; }
33 };
34 class ScienceFiction: public Book {
35 public:
36     int getLateFees(int delayed) { return 600 * delayed; }
37 };
38
39 int main() {
40     Novel novel;
```

```

41  novel.set_number(1);
42  novel.set_title("Omniscient Reader");
43  novel.set_author("singNsong");
44
45  Poet poet;
46  poet.set_number(1);
47  poet.set_title("Prelude");
48  poet.set_author("Yun Dong-ju");
49
50  ScienceFiction science_fiction;
51  science_fiction.set_number(2);
52  science_fiction.set_title("Martian");
53  science_fiction.set_author("Andy Weir");
54
55  cout << "novel == poet? " << (novel == poet ? "true" : "false") << endl
56      << "novel == science_fiction? " << (novel == science_fiction ? "true" : "false") << endl;
57  cout << endl;
58  cout << "delay fees" << endl
59      << "novel, 3 days: " << novel.getLateFees(3) << endl
60      << "poet, 2 days: " << novel.getLateFees(2) << endl
61      << "science_fiction, 5 days: " << novel.getLateFees(5) << endl;
62 }

```

실행 결과

```

shapelayer@ShapeLayer-MacBook:~/Documents/GitHub/ShapeLayer/compute...
19% ██████████ 9.4 GB ██████████ 41% ██████████
> g++ main.cpp && ./a.out
novel == poet? true
novel == science_fiction? false

delay fees
novel, 3 days: 900
poet, 2 days: 600
science_fiction, 5 days: 1500
~/Doc/GitH/S/computer-engineering-undergraduate-program/2.2-a/t/2024-11/s
/prob-8 > ↵ main ?3
>

```

실행 1

```
1 g++ main.cpp && ./a.out
```

Shell

```

1 novel == poet? true
2 novel == science_fiction? false
3
4 delay fees
5 novel, 3 days: 900
6 poet, 2 days: 600
7 science_fiction, 5 days: 1500

```

문제 #9

- GameCharacter 클래스: draw 가상 함수
- GameCharacter 클래스를 상속받는 캐릭터 클래스 정의
- GameCharacter 포인터를 담은 배열 구현

답안

```
1  #include "bits/stdc++.h"
2  // Required C++11: Refer `call_draw_all_characters` function
3
4  class GameCharacter {
5  public:
6      virtual void draw() = 0;
7      static vector<GameCharacter*> characters;
8
9      static vector<GameCharacter*> *getCharacters() {
10         return &characters;
11     }
12 };
13
14 vector<GameCharacter*> GameCharacter::characters;
15
16 class Player: public GameCharacter {
17     void draw() {
18         cout << "플레이어를 그립니다." << endl;
19     }
20 };
21
22 class Zombie: public GameCharacter {
23     void draw() {
24         cout << "좀비를 그립니다." << endl;
25     }
26 };
27
28 class Minion: public GameCharacter {
29     void draw() {
30         cout << "미니언을 그립니다." << endl;
31     }
32 };
33
34 class Hobbit: public GameCharacter {
35     void draw() {
36         cout << "호빗을 그립니다." << endl;
37     }
38 };
39
40 void init_register_all_characters() {
41     vector<GameCharacter*> *characters = GameCharacter::getCharacters();
42
43     characters->push_back(new Hobbit());
44     characters->push_back(new Player());
45     characters->push_back(new Zombie());
46     characters->push_back(new Minion());
```

C++

```

47 }
48
49 void call_draw_all_characters() {
50     vector<GameCharacter*> *characters = GameCharacter::getCharacters();
51
52     for (GameCharacter* character: *characters) {
53         character->draw();
54     }
55 }
56
57 int main() {
58     init_register_all_characters();
59     call_draw_all_characters();
60     return 0;
61 }

```

실행 결과

```

shapelayer@ShapeLayer-MacBook:~/Documents/GitHub/ShapeLayer/compute...
> g++ -std=c++11 main.cpp && ./a.out
호빗을 그립니다.
플레이어를 그립니다.
좀비를 그립니다.
미니언을 그립니다.
~/prob-9 > main ?3
>

```

실행 1

```
1 g++ -std=c++11 main.cpp && ./a.out
```

Shell

- 1 호빗을 그립니다.
- 2 플레이어를 그립니다.
- 3 좀비를 그립니다.
- 4 미니언을 그립니다.