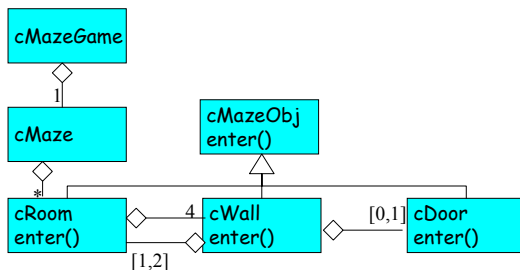


Design Patterns IV

Problem

You are building a game in which a player moves through rooms of a maze.

High Level Design



Maze Creation

```
cMaze* cMazeGame::CreateMaze(char *filename)
{
    // read maze layout from file and
    // build and link rooms
    cMaze* m=new cMaze;
    cRoom* r=new cRoom;
    cWall* w=new cWall;
    cDoor* d=new cDoor;
    w->linkDoor(d);
    w->linkRoom(r);
    r->linkWall(w,NORTH);

    etc.
    m->addRoom(r);
    etc.

    return m;
}
```

Problem 1

You hope to build several games. The games differ in what can happen in a room. To support this you make `cMazeGame` and `cRoom` abstract classes. Each concrete `cMazeGame` will use a different concrete `cRoom` class.

You could make `createMaze` a virtual function but that would violate the principle_____.

Propose another solution.

```
class cMazeGame
{
public:
    cMaze* createMaze(char* filename);
    :
    virtual cRoom* makeRoom();
    :
}
cMaze* cMazeGame::createMaze(char *filename)
{
    cRoom* r=makeRoom();
    :
}
```

Factory Method

`virtual cRoom* makeRoom()` is a factory method

Factory Method: define an interface for creating an object but let subclasses decide which class to instantiate.

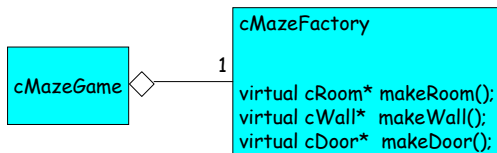
Problem

You realize that your games may actually have different types of walls, doors, etc.

You could add factory methods for each `cMazeObj` but `cGameMaze` is becoming too complicated.

What can you do?

Abstract Factory



Maze Creation

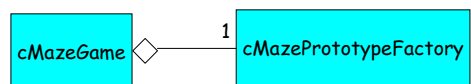
```
cMaze* cMazeGame::CreateMaze(char *filename)
{
    :
    cRoom* r=theFactory->makeRoom();
    cWall* w=theFactory->makeWall();
    cDoor* d=theFactor->makeDoor();
    :
}
```

Problem

As the mazeObjects proliferate, the factory structure mimics the structure.

Any suggestions?

Prototype



Design Patterns

- Creational Patterns
 - Factory Method
 - Abstract Factory
 - etc.
 - Prototype
 - Builder

Presentations 101

- Organization
- Slides
- Speaking

Organization

- Describe high level organization of your presentation
- Return to the description regularly so audience knows where you are

High Level Organization

- What are the most important issues
 - For each, what are important details
- How do the important issue relate to each other (flow)

Slides

- Pictures = good
- Words = not so good
- Lots of words = bad
- You may feel compelled to write a stream of consciousness on your slides but who really do you think will read that. You should rather think of slides as (a) reminders to you so you know what to say and (b) high-level landmarks the audience can follow. If there are more than 20 words on a slide the audience will not read it. Really! Raise your hand if you actually read this far in the slide.

Speaking

- Practice alone
- Practice with your group
- Get feedback