

Lecture 80: - Flyweight Design pattern

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Introduction

Let's assume we have to create some random games or use cases and it takes lot of RAM. & RAM is limited and RAM will not be able to handle all objects.

In such cases we have to go for Flyweight design pattern.

* Flyweight Design pattern is used to minimize memory usage by sharing common parts of state between multiple objects instead of storing all data in each object.

Game Example:-

✓ You are developing game have spaceship which stands shoots laser and many asteroids are also coming and you have to shoot that asteroids.

No. of asteroids depend on level of difficulty.
if easy - 3-4 asteroids
hard - much more asteroids.

Now all asteroids will be shown on screen if not sufficient then game will crash.
RAM is.

Solution: - to start using a single object instead of creating new one each time.

If we split object into two parts - intrinsic (shared) and extrinsic (unique) properties to reduce memory usage.

Let assume asteroid properties value range as ---

length - 10, 20, 30.

width - 10, 20, 30.

weight - 1, 2, 3.

color - Red, Green, Blue.

texture - Soft, Hard, mix

using these
combⁿ
properties
one
made

Asteroid
int length;
int width;
int weight;
string color;
string texture;
int pos, x, posy;
int velx, vely;

No need to recreate them instead reuse them by just making diff objects.

Now we are generating asteroid at any place & velocity and only this part is varying in all objects.

And as we have fixed properties and fixed options of range so these properties will be same for multiple objects.

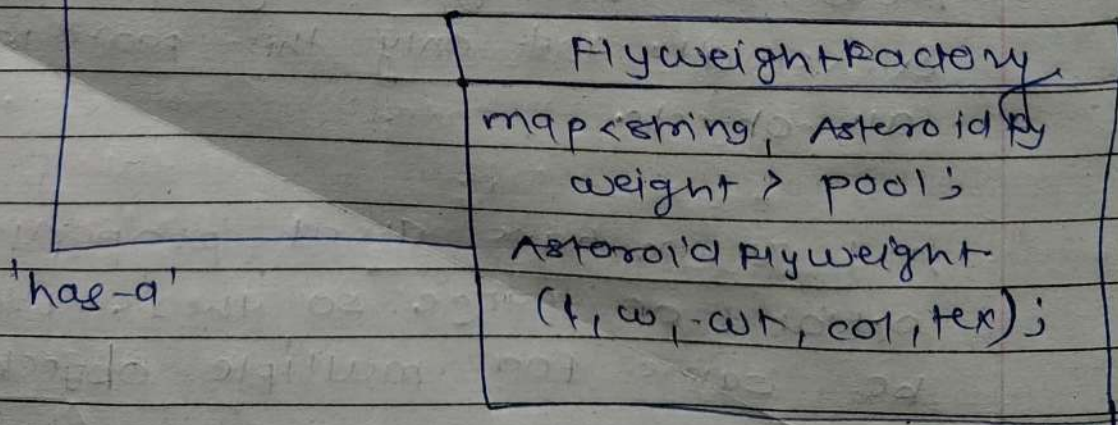
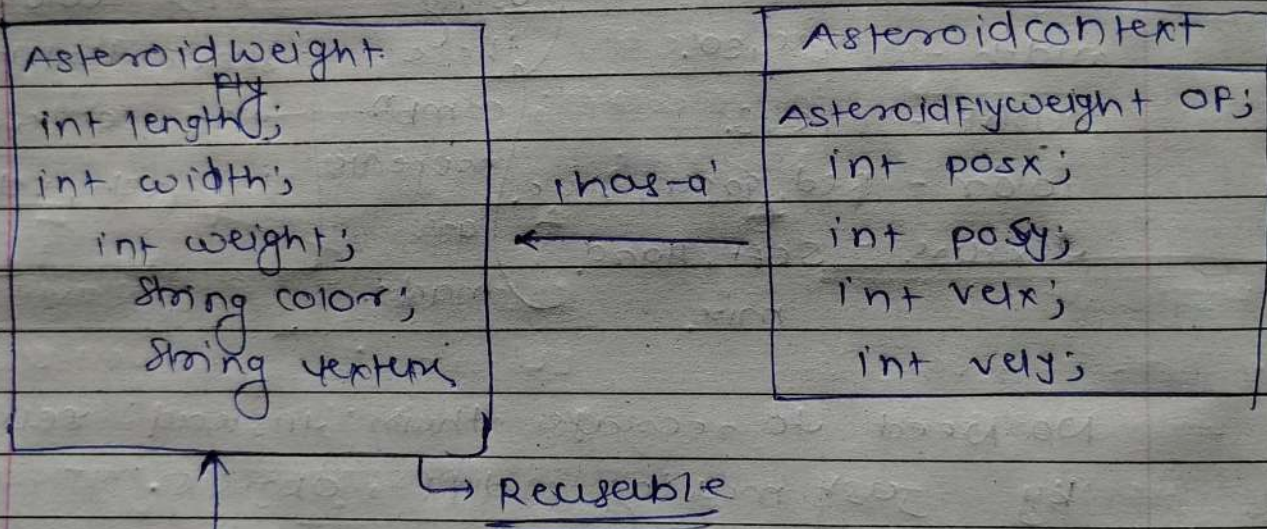
divide these properties in 2 parts :-

1) Intrinsic property:-

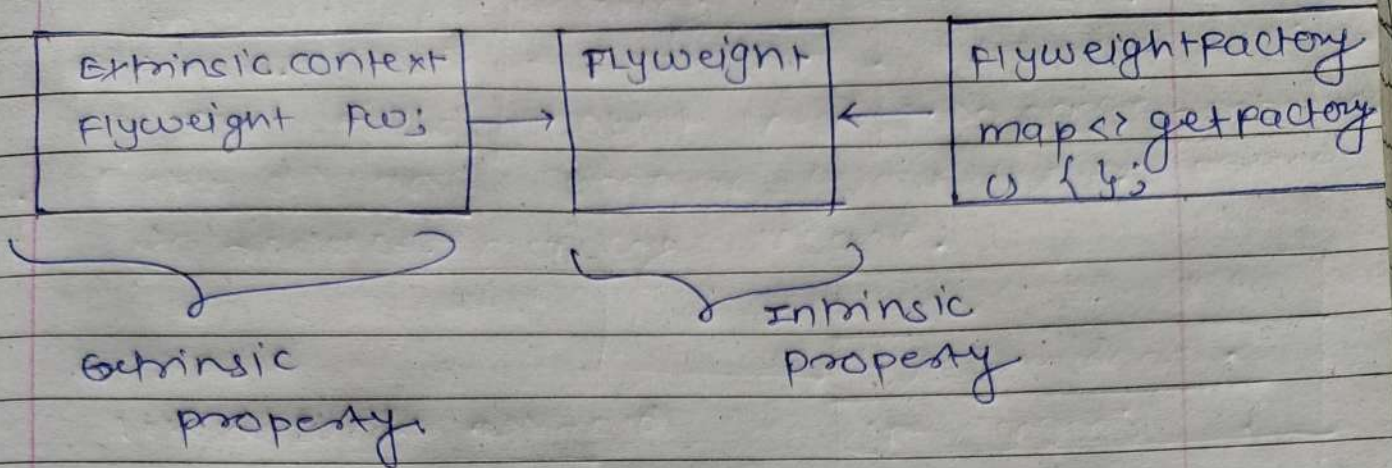
same property which can be reuse
In our game it's length, width, weight
color, theme.

2) Extrinsic property

Not same for any asteroids, can't be
reused. In our game it's velocity,
position.



* Standard UML



Standard Definition.

Flyweight uses sharing to support large number of fine grained objects effectively.

intrinsic - (shared among objects)

extrinsic - (supplied by client externally).

Real world use case

① Games like GTA-5

- optimise RAM storage

② used in text editors.

- to provide properties to characters.