6.6 Sports Photographer

Inheritance - Rules to Remember

1. **A subclass can add new private instance variables.**
2. **A subclass can add new public or private methods.**
3. **A subclass can override (redefine) inherited methods.**
4. **A subclass must define its own constructors.**
5. **A subclass cannot access the private members of its superclass.**

Description

A sports photographer takes pictures of youth sports teams. Coaches and parents can buy pictures by purchasing one of five different picture packets. The packets offered include the StarterPacket, MemoryPacket, AllStarPacket, ChampionPacket, and CollectorPacket. Each packet offers a different combination of photograph sizes and quantities. The number and type of photographs offered in each packet are listed below.

Packet Name	8x10	5x7	wallets	magazine cover	trading cards
Starter	1				
Memory	1	2	8		
AllStar	1			1	16
Champion	1	2		1	16
Collector	1	2	8	1	16

The **StarterPacket** class is defined with the following attributes and behaviors

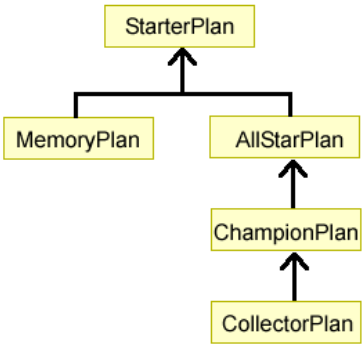
Attributes (instance variables)

- photo8x10 - the number of 8x10 photos

Behavior (methods)

- getPacketName - returns the name of the picture packet
- toString - returns a string representation of the object's instance variables

Define two classes named **MemoryPacket** and **AllStarPacket** that both inherit the *StarterPacket* class. Define a class named **ChampionPacket** that inherits from the *AllStarPacket*. Define a class name **CollectorsPacket** that inherits from the *ChampionPacket*. The inheritance relationship is illustrated by the diagram below:



Source Code

Open and copy the following workspace to your home directory: Sports Photographer

Modifications

Memory Class extends StarterPacket

Make the following additions and modifications to the *Memory*Packet class:

1. A subclass can add new private instance variables.

- Add an instance variable of type *int* named **photo5x7**
- Add an instance variable of type *int* **photoWallets**

2. A subclass can add new public or private methods.

- none

3. A subclass can override (redefine) inherited methods.

- Override the **getPacketName** method so that it returns the packet name "Memory Packet"
- Override the **toString** method so that it includes the instance variables *photo5x7* and *photoWallets*

4. A subclass must define its own constructors.

- Add a **default constructor** that initializes *photo5x7* to a value of 2 and *photoWallets* to a value of 8

AllStarPacket class extends StarterPacket

Make the following additions and modifications to the *AllStarPacket* class:

1. A subclass can add new private instance variables.

- Add an instance variable of type *int* named **photoMagazineCover**
- Add an instance variable of type *int* named **photoTradingCards**

2. A subclass can add new public or private methods.

- none

3. A subclass can override (redefine) inherited methods.

- Override the **getPacketName** method so that it returns the packet name "AllStar Packet"
- Override the **toString** method so that it includes the instance variables *photoMagazine* and *photoTradingCards*

4. A subclass must define its own constructors.

- Add a **default constructor** that initializes *photoMagazineCover* to a value of 1 and *photoTradingCards* to a value of 16

ChampionPacket class extends AllStarPacket

Make the following additions and modifications to the *ChampionPacket* class:

1. A subclass can add new private instance variables.

- Add an instance variable of type *int* named **photo5x7**

2. A subclass can add new public or private methods.

- none

3. A subclass can override (redefine) inherited methods.

- Override the **getPacketName** method so that it returns the packet name "Champion Packet"
- Override the **toString** method so that it includes the instance variable *photo5x7*

4. A subclass must define its own constructors.

- Add a **default constructor** that initializes *photo5x7* to a value of 2

CollectorPacket class extends ChampionPacket

Make the following additions and modifications to the *CollectorPacket* class:

1. A subclass can add new private instance variables.

- Add an instance variable of type *int* named **photoWallets**

2. A subclass can add new public or private methods.

- none

3. A subclass can override (redefine) inherited methods.

- Override the **getPacketName** method so that it returns the packet name "Collector Packet"
- Override the **toString** method so that it includes the instance variable *photoWallets*

4. A subclass must define its own constructors.

- Add a **default constructor** that initializes *photoWallets* to a value of 8

Sample Run

```
Sports Photography
------------------
1. Starter Plan
2. Memory Plan
3. All Star Plan
4. Champion Plan
5. Collector Plan

Select plan -->1

Picture Plan
============
StarterPlan
8 x 10 = 1
```

```
Sports Photography
------------------
1. Starter Plan
2. Memory Plan
3. All Star Plan
4. Champion Plan
5. Collector Plan

Select plan -->2

Picture Plan
============
MemoryPlan
8 x 10 = 1
5 x 7 = 2
Wallets = 8


Sports Photography
------------------
1. Starter Plan
2. Memory Plan
3. All Star Plan
4. Champion Plan
5. Collector Plan

Select plan -->3

Picture Plan
============
AllStarPlan
8 x 10 = 1
Magazine Cover = 1
Trading Cards  = 16


Sports Photography
------------------
1. Starter Plan
2. Memory Plan
3. All Star Plan
4. Champion Plan
5. Collector Plan

Select plan -->4

Picture Plan
============
ChampionPlan
8 x 10 = 1
Magazine Cover = 1
Trading Cards  = 16
5 x 7 = 2


Sports Photography
------------------
1. Starter Plan
2. Memory Plan
3. All Star Plan
4. Champion Plan
5. Collector Plan

Select plan -->5

Picture Plan
============
CollectorPlan
8 x 10 = 1
Magazine Cover = 1
Trading Cards  = 16
5 x 7 = 2
Wallets = 8
```