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| 2017년 10월 12일 Java 실습보고서 |
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| 실습 1) 업캐스팅, 다운캐스팅 |

**■ 소스코드**

**[TicketDriver.java]**

**package** source;

**import** java.text.SimpleDateFormat;

**import** java.util.Date;

**public** **class** TicketDriver {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

// 업캐스팅

Ticket t1=**new** GeneralTicket(100, 1000, **true**);

// 다운캐스팅(형변환 필요, 부모 객체가 자식 객체를 가리키는 경우만 가능)

GeneralTicket t2=(GeneralTicket)t1;

/\*

\* 이 경우는 오류!

\* Ticket t3=new Ticket();

\* GeneralTicket t2=(GeneralTicket)t3;

\*/

}

}

**[Ticket.java]**

**package** source;

**public** **class** Ticket {

**protected** **int** number;

**protected** **double** price;

**public** Ticket(){

**this**(0, 0.0);

}

**public** Ticket(**int** number, **double** price){

**this**.number=number;

**this**.price=price;

}

**public** **void** setPrice(**double** price){

**this**.price=price;

}

**public** **void** setNumber(**int** number){

**this**.number=number;

}

**public** **int** getNumber(){

**return** number;

}

**public** **double** getPrice(){

**return** price;

}

**public** String toString(){

**return** "name : "+number+", price : "+price;

}

}

**[AdvanceTicket.java]**

**package** source;

**public** **class** AdvanceTicket **extends** Ticket{

**private** **int** advanceDays;

**public** AdvanceTicket(){

**super**(0, 0.0);

**this**.advanceDays=0;

}

**public** AdvanceTicket(**int** number, **double** price, **int** advanceDays){

**super**(number, price);

**this**.advanceDays=advanceDays;

}

**public** **double** getPrice(){

**if**(advanceDays>=30)

**return** price\*0.6;

**else** **if**(advanceDays>=20)

**return** price\*0.7;

**else** **if**(advanceDays>=10)

**return** price\*0.8;

**else**

**return** price;

}

**public** **int** getAdvanceDays(){

**return** advanceDays;

}

**public** String toString(){

**return** getNumber()+" : "+getPrice();

}

}

**[GeneralTicket.java]**

**package** source;

**public** **class** GeneralTicket **extends** Ticket{

**private** **boolean** payByCredit;

**public** GeneralTicket(){

**this**.payByCredit=**false**;

}

**public** GeneralTicket(**int** number, **double** price, **boolean** payByCredit){

**super**(number, price);

**this**.payByCredit=payByCredit;

}

**public** **double** getPrice(){

**if**(**this**.payByCredit)

**return** price\*1.1;

**return** price;

}

**public** **boolean** getPayByCredit(){

**return** payByCredit;

}

**public** String toString(){

**return** getNumber()+" : "+getPrice();

}

}

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| 실습 2) 오버라이딩 활용(다형성) \*\*\*\*\*\*\*\* |

**■ 소스코드**

**[TicketDriver.java]**

**package** source;

**import** java.text.SimpleDateFormat;

**import** java.util.Date;

**public** **class** TicketDriver {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

TicketManager manager=**new** TicketManager(10);

// 업캐스팅

manager.reservedTicket(**new** Ticket(100, 1000));

manager.reservedTicket(**new** GeneralTicket(200, 1000, **true**));

manager.reservedTicket(**new** AdvanceTicket(300, 1000, 50));

manager.showTicket();

}

}

**[TicketManager.java]**

**package** source;

**public** **class** TicketManager{

**private** **int** ticketCount; // 전체 판매 티켓수

Ticket tickets[]; // 부모 객체로 배열 만듦.(여러 종류의 티켓 종류를 배열에 저장)

**int** count;

**public** TicketManager(**int** count){

**this**.count=0;

ticketCount=count;

tickets=**new** Ticket[ticketCount];

}

**public** **void** reservedTicket(Ticket t){

tickets[count++]=t;

}

**public** **void** showTicket(){

**for**(**int** i=0; i<count; i++)

tickets[i].show();

}

}

**[Ticket.java]**

**package** source;

**public** **class** Ticket {

**protected** **int** number;

**protected** **double** price;

**public** Ticket(){

**this**(0, 0.0);

}

**public** Ticket(**int** number, **double** price){

**this**.number=number;

**this**.price=price;

}

**public** **void** setPrice(**double** price){

**this**.price=price;

}

**public** **void** setNumber(**int** number){

**this**.number=number;

}

**public** **int** getNumber(){

**return** number;

}

**public** **double** getPrice(){

**return** price;

}

**public** String toString(){

**return** "name : "+number+", price : "+price;

}

**public** **void** show(){

System.***out***.println("Ticket Class");

}

}

**[AdvanceTicket.java]**

**package** source;

**public** **class** AdvanceTicket **extends** Ticket{

**private** **int** advanceDays;

**public** AdvanceTicket(){

**super**(0, 0.0);

**this**.advanceDays=0;

}

**public** AdvanceTicket(**int** number, **double** price, **int** advanceDays){

**super**(number, price);

**this**.advanceDays=advanceDays;

}

**public** **double** getPrice(){

**if**(advanceDays>=30)

**return** price\*0.6;

**else** **if**(advanceDays>=20)

**return** price\*0.7;

**else** **if**(advanceDays>=10)

**return** price\*0.8;

**else**

**return** price;

}

**public** **int** getAdvanceDays(){

**return** advanceDays;

}

**public** String toString(){

**return** getNumber()+" : "+getPrice();

}

**public** **void** show(){

System.***out***.println("AdvanceTicket Class");

}

}

**[GeneralTicket.java]**

**package** source;

**public** **class** GeneralTicket **extends** Ticket{

**private** **boolean** payByCredit;

**public** GeneralTicket(){

**this**.payByCredit=**false**;

}

**public** GeneralTicket(**int** number, **double** price, **boolean** payByCredit){

**super**(number, price);

**this**.payByCredit=payByCredit;

}

**public** **double** getPrice(){

**if**(**this**.payByCredit)

**return** price\*1.1;

**return** price;

}

**public** **boolean** getPayByCredit(){

**return** payByCredit;

}

**public** String toString(){

**return** getNumber()+" : "+getPrice();

}

**public** **void** show(){

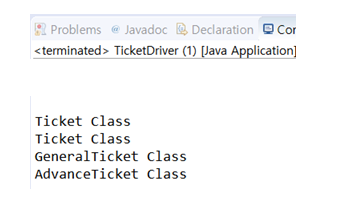
**super**.show(); // 부모 객체의 show()함수 호출

System.***out***.println("GeneralTicket Class");

}

}

**■ 결과화면**

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| 실습 3) 추상 클래스, 추상 메소드 |

**■ 소스코드**

**[TicketDriver.java]**

**package** source;

**import** java.text.SimpleDateFormat;

**import** java.util.Date;

**public** **class** TicketDriver {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

TicketManager manager=**new** TicketManager(10);

// 업캐스팅

//manager.reservedTicket(new Ticket(100, 1000));

manager.reservedTicket(**new** GeneralTicket(200, 1000, **true**));

manager.reservedTicket(**new** AdvanceTicket(300, 1000, 50));

manager.showTicket();

}

}

**[TicketManager.java]**

**package** source;

**public** **class** TicketManager{

**private** **int** ticketCount; // 전체 판매 티켓수

Ticket tickets[]; // 부모 객체로 배열 만듦.(여러 종류의 티켓 종류를 배열에 저장)

**int** count;

**public** TicketManager(**int** count){

**this**.count=0;

ticketCount=count;

tickets=**new** Ticket[ticketCount];

}

**public** **void** reservedTicket(Ticket t){

tickets[count++]=t;

}

**public** **void** showTicket(){

**for**(**int** i=0; i<count; i++)

tickets[i].show();

}

}

**[Ticket.java]**

**package** source;

//Ticket클래스는 반드시 결제를 통해서만 존재하는 클래스 => 추상클래스(가격 측정의 재정의를 해야됨)

**public** **abstract** **class** Ticket {

**protected** **int** number;

**protected** **double** price;

**public** Ticket(){

**this**(0, 0.0);

}

**public** Ticket(**int** number, **double** price){

**this**.number=number;

**this**.price=price;

}

**public** **void** setPrice(**double** price){

**this**.price=price;

}

**public** **void** setNumber(**int** number){

**this**.number=number;

}

**public** **int** getNumber(){

**return** number;

}

**public** **abstract** **double** getPrice(); // 상속받을 시 반드시 함수 재정의 필요

**public** **abstract** String toString(); // 상속받을 시 반드시 함수 재정의 필요

**public** **void** show(){

System.***out***.println("Ticket Class");

}

}

**[AdvanceTicket.java]**

**package** source;

**public** **class** AdvanceTicket **extends** Ticket{

**private** **int** advanceDays;

**public** AdvanceTicket(){

**super**(0, 0.0);

**this**.advanceDays=0;

}

**public** AdvanceTicket(**int** number, **double** price, **int** advanceDays){

**super**(number, price);

**this**.advanceDays=advanceDays;

}

**public** **double** getPrice(){

**if**(advanceDays>=30)

**return** price\*0.6;

**else** **if**(advanceDays>=20)

**return** price\*0.7;

**else** **if**(advanceDays>=10)

**return** price\*0.8;

**else**

**return** price;

}

**public** **int** getAdvanceDays(){

**return** advanceDays;

}

**public** String toString(){

**return** getNumber()+" : "+getPrice();

}

**public** **void** show(){

System.***out***.println("AdvanceTicket Class");

}

}

**[GeneralTicket.java]**

**package** source;

**public** **class** GeneralTicket **extends** Ticket{

**private** **boolean** payByCredit;

**public** GeneralTicket(){

**this**.payByCredit=**false**;

}

**public** GeneralTicket(**int** number, **double** price, **boolean** payByCredit){

**super**(number, price);

**this**.payByCredit=payByCredit;

}

**public** **double** getPrice(){

**if**(**this**.payByCredit)

**return** price\*1.1;

**else**

**return** price;

}

**public** **boolean** getPayByCredit(){

**return** payByCredit;

}

**public** String toString(){

**return** getNumber()+" : "+getPrice();

}

**public** **void** show(){

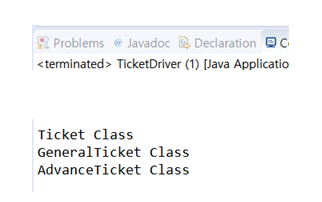
**super**.show(); // 부모 객체의 show()함수 호출

System.***out***.println("GeneralTicket Class");

}

}

**■ 결과화면**

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| 실습 4) interface |

**■ 소스코드**

**[**TicketInterface**.java]**

**package** source;

**public** **interface** TicketInterface {

**void** show(); // public abstact 메소드

}

**[**TicketManager**.java]**

**package** source;

**public** **class** TicketManager{

**private** **int** ticketCount; // 전체 판매 티켓수

Ticket tickets[]; // 부모 객체로 배열 만듦.(여러 종류의 티켓 종류를 배열에 저장)

**int** count;

**public** TicketManager(**int** count){

**this**.count=0;

ticketCount=count;

tickets=**new** Ticket[ticketCount];

}

**public** **void** reservedTicket(Ticket t){

tickets[count++]=t;

}

**public** **void** showTicket(){

**for**(**int** i=0; i<count; i++){

**if**(tickets[i] **instanceof** TicketInterface)

((TicketInterface)tickets[i]).show();

}

}

}

**[TicketDriver.java]**

**package source;**

**import java.text.SimpleDateFormat;**

**import java.util.Date;**

**public class TicketDriver {**

**public static void main(String[] args) {**

**// TODO Auto-generated method stub**

**printName();**

**TicketManager manager=new TicketManager(10);**

**// 업캐스팅**

**//manager.reservedTicket(new Ticket(100, 1000));**

**manager.reservedTicket(new GeneralTicket(200, 1000, true));**

**manager.reservedTicket(new AdvanceTicket(300, 1000, 50));**

**manager.showTicket();**

**}**

**}**

**[**Ticket**.java]**

**package** source;

//Ticket클래스는 반드시 결제를 통해서만 존재하는 클래스 => 추상클래스(가격 측정의 재정의를 해야됨)

**public** **abstract** **class** Ticket {

**protected** **int** number;

**protected** **double** price;

**public** Ticket(){

**this**(0, 0.0);

}

**public** Ticket(**int** number, **double** price){

**this**.number=number;

**this**.price=price;

}

**public** **void** setPrice(**double** price){

**this**.price=price;

}

**public** **void** setNumber(**int** number){

**this**.number=number;

}

**public** **int** getNumber(){

**return** number;

}

**public** **abstract** **double** getPrice(); // 상속받을 시 반드시 함수 재정의 필요

**public** **abstract** String toString(); // 상속받을 시 반드시 함수 재정의 필요

}

**[**AdvanceTicket**.java]**

**package** source;

**public** **class** AdvanceTicket **extends** Ticket **implements** TicketInterface{

**private** **int** advanceDays;

**public** AdvanceTicket(){

**super**(0, 0.0);

**this**.advanceDays=0;

}

**public** AdvanceTicket(**int** number, **double** price, **int** advanceDays){

**super**(number, price);

**this**.advanceDays=advanceDays;

}

**public** **double** getPrice(){

**if**(advanceDays>=30)

**return** price\*0.6;

**else** **if**(advanceDays>=20)

**return** price\*0.7;

**else** **if**(advanceDays>=10)

**return** price\*0.8;

**else**

**return** price;

}

**public** **int** getAdvanceDays(){

**return** advanceDays;

}

**public** String toString(){

**return** getNumber()+" : "+getPrice();

}

**public** **void** show(){

System.***out***.println("AdvanceTicket Class");

}

}

**[**GeneralTicket**.java]**

**package** source;

**public** **class** GeneralTicket **extends** Ticket **implements** TicketInterface{

**private** **boolean** payByCredit;

**public** GeneralTicket(){

**this**.payByCredit=**false**;

}

**public** GeneralTicket(**int** number, **double** price, **boolean** payByCredit){

**super**(number, price);

**this**.payByCredit=payByCredit;

}

**public** **double** getPrice(){

**if**(**this**.payByCredit)

**return** price\*1.1;

**else**

**return** price;

}

**public** **boolean** getPayByCredit(){

**return** payByCredit;

}

**public** String toString(){

**return** getNumber()+" : "+getPrice();

}

**public** **void** show(){

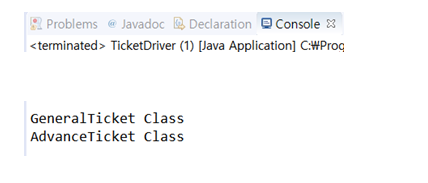
//super.show(); // 부모 객체의 show()함수 호출

System.***out***.println("GeneralTicket Class");

}

}

**■ 결과화면**

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