**public** **class** TV\_Program {

 **private** **double** audienceRate;

 **public** TV\_Program(**double** audienceRate) {

 **this**.audienceRate = audienceRate;

 }

**public** TV\_Program(TV\_Program p) {

 **this**.audienceRate = p.audienceRate;

 }

 **public** **double** getAudienceRate() {

 **return** audienceRate;

 }

 **public** **void** display()

 {

 System.*out*.println("Audience Rate: "+audienceRate);

 }

}

**public** **interface** Viewable {

 **void** display();

}

**public** **abstract** **class** TV\_Channel **implements** Viewable{

 **private** **int** views;

 **private** **boolean** live;

 **protected** TV\_Program arProg[];

 **protected** **int** nbProg;

 TV\_Channel(**int** views, **boolean** live) {

 **this**.views = views;

 **this**.live = live;

 arProg = **new** TV\_Program[20];

 nbProg = 0;

 }

 TV\_Channel(TV\_Channel tvc) {

 views = tvc.views;

 live = tvc.live;

 arProg = **new** TV\_Program[tvc.arProg.length];

 **for**(**int** i=0; i<tvc.nbProg; i++)

 arProg[i] = **new** TV\_Program(tvc.arProg[i]);

 nbProg = tvc. nbProg;

 }

 **public** **int** getViews() {

 **return** views;

 }

 **public** **boolean** isLive() {

 **return** live;

 }

 **public** **abstract** **double** CalculateRating();

 **public** **void** display() {

 System.*out*.println(views);

 System.*out*.println(live);

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

 arProg[i].display();

 }

}

**public** **class** News **extends** TV\_Channel {

 **private** **int** newsSegments;

 **private** **int** breakingNews;

 News(**int** views, **boolean** live,**int** ns, **int** bn ) {

 **super**(views, live);

 newsSegments = ns;

 breakingNews = bn;

 }

 **public** News(News t) {

 **super**(t);

 newsSegments = t.newsSegments;

 breakingNews = t.breakingNews;

 }

 **public** **double** CalculateRating() {

 **double** avg = 0.0;

 **double** rating = getViews() / breakingNews ;

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

 avg += arProg[i].getAudienceRate();

 **if** (nbProg != 0)

 avg /= nbProg;

 **return** rating + avg;

 }

 **public** **void** display() {

 **super**.display();

 System.*out*.print(newsSegments + " "+ breakingNews);

 }

 **public** **int** getBreakingNews() {

 **return** breakingNews;

 }

}

**public** **class** Sports **extends** TV\_Channel {

 **private** **int** nbMatches;

 **public** Sports(**int** views, **boolean** live,**int** m ) {

 **super**(views, live);

 nbMatches=m;

 }

 **public** Sports(Sports s) {

 **super**(s);

 nbMatches=s.nbMatches;

 }

 **public** **double** CalculateRating() {

 **return** getViews()/nbMatches\*1.5;

 }

 **public** **void** display() {

 **super**.display();

 System.*out*.print("No Of Matches "+ nbMatches);

 }

 **public** **int** getNbMatches() {

 **return** nbMatches;

 }

}

**public** **class** TV\_Group {

 **private** String name;

 **private** TV\_Channel arTV[];

 **private** **int** nbTV;

 TV\_Group(String name) {

 name = name;

 arTV= **new** TV\_Channel[25];

 nbTV = 0;

 }

 **public** **void** add(TV\_Channel t) {

 **if**(nbTV < arTV.length) {

 **if**(t **instanceof** News)

 arTV[nbTV] = **new** News((News) t);

 **else**

 arTV[nbTV] = **new** Sports((Sports) t);

 nbTV++;

 }

 }

 **public** **int** countLiveSport() {

 **int** c=0;

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

 **if**(( arTV[i] **instanceof** Sports ) && arTV[i].isLive())

 c++;

 **return** c;

 }

 **public** **void** display(**int** n) {

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

 **if**( ( arTV[i] **instanceof** Sports ) &&

 ( ((Sports)arTV[i]).getNbMatches() > n) )

 arTV[i].display();

 }

**public** News[] getNews(**int** b) {

 News[] res = **new** News[nbTV];

 **int** k=0;

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

 **if**( ( arTV[i] **instanceof** News ) &&

 ( ((News)arTV[i]).getBreakingNews() > b ) )

 {

 res[k] = (News) arTV[i];

 k++;

 }

**return** res;

}

 **public** **void** splitChannel(TV\_Channel t1[], News[] t2) {

 **int** j=0, k=0;

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

 **if**( ( arTV[i] **instanceof** Sports ) &&

 ( ((Sports) arTV[i]).getNbMatches() > 20 ) ) {

 t1[j++] = arTV[i];

 }

 **else** {

 **if**(arTV[i].getViews() > 3000) {

 t2[k++] = (News) arTV[i];

 }

 }

 }

 }

}