Programming Fundamentals II: Theoretical Project

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Analysis of requirements

The problem that we are required to implement is a music festival, with all that involves the creation of one, so, let's begin to analyse it part by part.

The first requirement defines *Festival* class, which has a name, city, and a list of artists that will participate in the festival. This class collects all other classes in the project.

In the first requirement we are also told about the *Artist* class, which defines the artist that will go to the festival, all artists have a stage name and a musical genre, and we know whether or not they are headliners for the festival, the price for each ticket, the duration of their performance, maximum allowed capacity, and if they have their assistance is confirmed. In addition, artists can be soloists or groups. *Soloists* need to inform if they will be needing a dressing room and their manager's number, and *Groups* must let us know the number of members said group has, and if they will be selling merchandising.

In the second requirement we get to know about the *Attendees* of the music festival, they can purchase tickets (up to a total of 7) and have a name, ID, credit card number and if they have attended previously. Moreover, we also know that *VIP Attendees* exist, who also have a VIP card number. *Tickets* can only be bought if the concert has been confirmed, each ticket has a unique ID.

In the third requirement we are told about the discount the festival offers, this, along with the prices of the merchandising that may be sold, is in an interface *iConstants*.

Finally, we also need a *Security Company*, they have a name and a price per guard.

The fifth requirement defines the queries that the system must allow:
- Show all the information of all artists.
- Show how much the security would cost under certain conditions.
- Check the final prize of a ticket after all discounts have been applied (if applicable). This is only for registered attendees.
- Estimate how much an attendee would spend if they went to all headliner's concerts and bought merchandise in all stands.
- Purchase a ticket for a concert. Attendees don't have to be registered to do so.
- Show all information that a certain attendee has bought.
- Show all information of concerts with a merchandising stand for which a VIP attendee has purchased tickets

The programme must also be able to catch some exceptions:
- If files do not exist
- If the number of queries that has been selected is not in the valid interval
- If the programme receives non-numerical data when expectation numerical
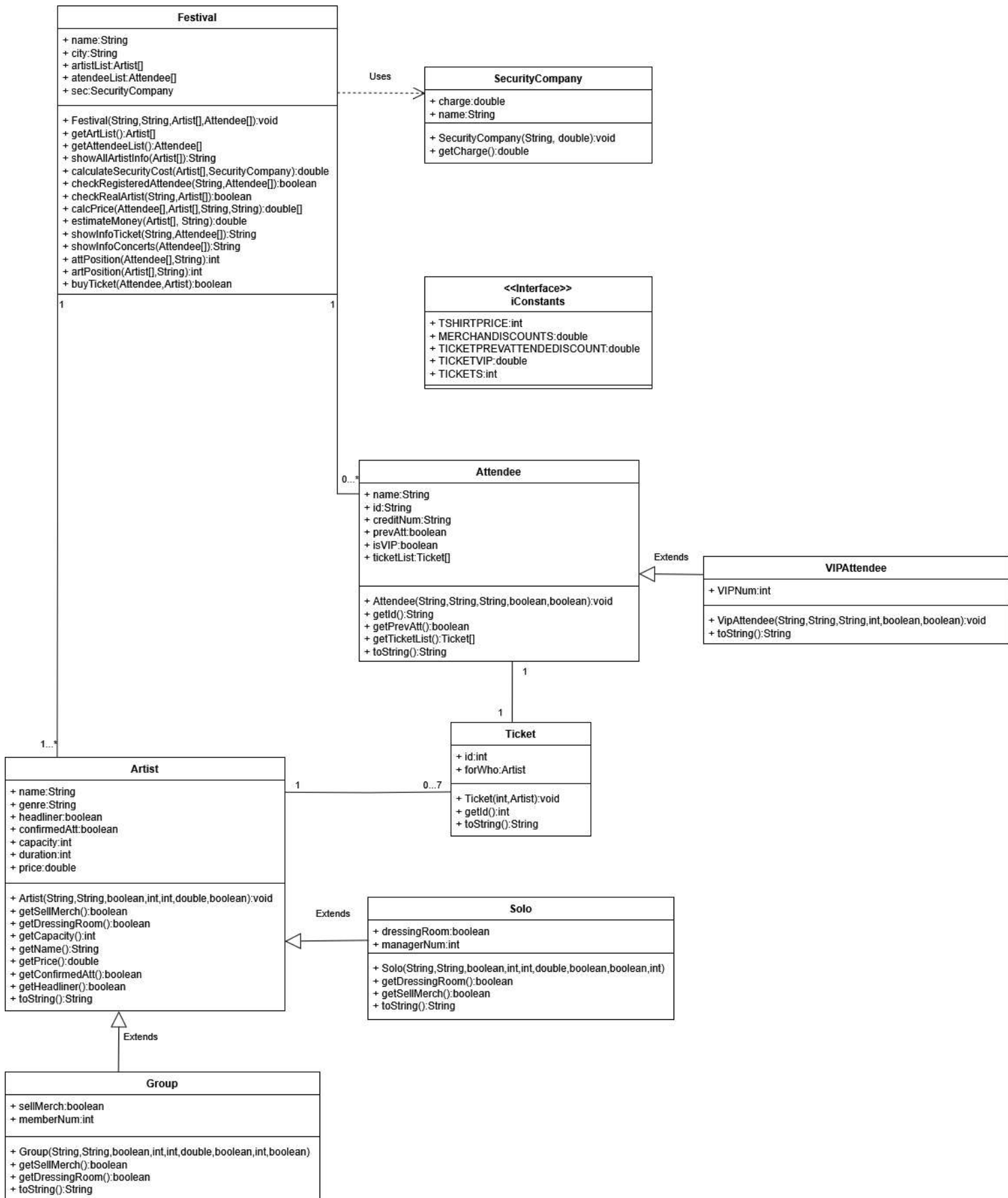- If an attendee tries to buy more than 7 tickets

First of all, we need to implement a method to read the .txt files that we have been given which contain all information of both *Artists* and registered *Attendees.*

Then, we create an array for all artists, however, as we will not be creating an "artist" per se, as they will all be *Soloists* or *Groups,* we define *Artist* as an abstract method. Similarly, we read *Attendees* and create an array that will be shared by both normal and VIP attendees by reading from the file.

As an Attendee buys a ticket, we should give him the opportunity to see the information of that ticket by the introduction of their ID, implementing perfectly the query 6 with all the requirements

Final query, the query 7, allows the Attendees to see the information of a VIP Attendee that has bought a ticket for a concert with a merchandise stand

UML of the project

Festival
+ name:String
+ city:String
+ artistList:Artist[]
+ atendeeList:Attendee[]
+ sec:SecurityCompany

+ Festival(String,String,Artist[],Attendee[]):void
+ getArtList():Artist[]
+ getAttendeeList():Attendee[]
+ showAllArtistInfo(Artist[]):String
+ calculateSecurityCost(Artist[],SecurityCompany):double
+ checkRegisteredAttendee(String,Attendee[]):boolean
+ checkRealArtist(String,Artist[]):boolean
+ calcPrice(Attendee[],Artist[],String,String):double[]
+ estimateMoney(Artist[], String):double
+ showInfoTicket(String,Attendee[]):String
+ showInfoConcerts(Attendee[]):String
+ attPosition(Attendee[],String):int
+ artPosition(Artist[],String):int
+ buyTicket(Attendee,Artist):boolean

Uses

SecurityCompany
+ charge:double
+ name:String

+ SecurityCompany(String, double):void
+ getCharge():double

<<Interface>> iConstants
+ TSHIRTPRICE:int
+ MERCHANDISCOUNTS:double
+ TICKETPREVATTENDEDISCOUNT:double
+ TICKETVIP:double
+ TICKETS:int

Attendee
+ name:String
+ id:String
+ creditNum:String
+ prevAtt:boolean
+ isVIP:boolean
+ ticketList:Ticket[]

+ Attendee(String,String,String,boolean,boolean):void
+ getId():String
+ getPrevAtt():boolean
+ getTicketList():Ticket[]
+ toString():String

Extends

VIPAttendee
+ VIPNum:int

+ VipAttendee(String,String,String,int,boolean,boolean):void
+ toString():String

Ticket
+ id:int
+ forWho:Artist

+ Ticket(int,Artist):void
+ getId():int
+ toString():String

Artist
+ name:String
+ genre:String
+ headliner:boolean
+ confirmedAtt:boolean
+ capacity:int
+ duration:int
+ price:double

+ Artist(String,String,boolean,int,int,double,boolean):void
+ getSellMerch():boolean
+ getDressingRoom():boolean
+ getCapacity():int
+ getName():String
+ getPrice():double
+ getConfirmedAtt():boolean
+ getHeadliner():boolean
+ toString():String

Extends

Solo
+ dressingRoom:boolean
+ managerNum:int

+ Solo(String,String,boolean,int,int,double,boolean,boolean,int)
+ getDressingRoom():boolean
+ getSellMerch():boolean
+ toString():String

Extends

Group
+ sellMerch:boolean
+ memberNum:int

+ Group(String,String,boolean,int,int,double,boolean,int,boolean)
+ getSellMerch():boolean
+ getDressingRoom():boolean
+ toString():String

User manual

Once you execute the program, it will ask about some information about the Festival (name and city) which is used to create the Festival.

```
Welcome to our festival management system!
IMPORTANT!! Do not use spaces, instead use underscores!!
Please, indicate the festival name: ESI_Festival
Thanks, now please indicate the city the festival will be held on: Ciudad_Real
Choose one of the following options:
1. Show the information of all scheduled artists.
2. Calculate how much the festival's security service would cost.
3. Calculate the cost of a ticket. Only for registered attendees!!
4. Estimate the cost of attending to all headliners and buying a t-shirt in all merchandising stands.
5. Purchase a ticket. Only for confirmed artists!!
6. Show all ticket information someone has purchased.
7. Show the information of concerts with merchandising for which a VIP has purchased tickets.
8. Exit the system
```

Then, a menu with 8 options will be displayed:
1. Shows the information of all artists in the Festival

```
Here is all the information about our artists
Name: Maneskin Genre: rock Is a headliner?: false Has confirmed assistance: true Capacity for the concert: 15 Duration of the concert: 90 Price: 70.0 How many members are there in the group?: 4 Do they sell merchandising?: true
Name: Aitana Genre: pop Is a headliner?: true Has confirmed assistance: false Capacity for the concert: 20 Duration of the concert: 90 Price: 80.0Do they need a dressing room?: true Manager phone number: 123456789
Name: Quevedo Genre: reggaeton Is a headliner?: false Has confirmed assistance: true Capacity for the concert: 5 Duration of the concert: 60 Price: 40.0Do they need a dressing room?: false Manager phone number: 987654321
Name: Muse Genre: rock Is a headliner?: true Has confirmed assistance: true Capacity for the concert: 30 Duration of the concert: 120 Price: 90.0 How many members are there in the group?: 3 Do they sell merchandising?: false
Name: Coldplay Genre: pop Is a headliner?: true Has confirmed assistance: false Capacity for the concert: 50 Duration of the concert: 120 Price: 120.0 How many members are there in the group?: 4 Do they sell merchandising?: true
Name: Natti Genre: reggaeton Is a headliner?: false Has confirmed assistance: true Capacity for the concert: 10 Duration of the concert: 75 Price: 50.0Do they need a dressing room?: false Manager phone number: 568923147
Name: Slipknot Genre: metal Is a headliner?: true Has confirmed assistance: true Capacity for the concert: 20 Duration of the concert: 90 Price: 80.0 How many members are there in the group?: 9 Do they sell merchandising?: true
Name: Paramode Genre: rock Is a headliner?: false Has confirmed assistance: true Capacity for the concert: 15 Duration of the concert: 90 Price: 60.0 How many members are there in the group?: 3 Do they sell merchandising?: false
Name: Korn Genre: metal Is a headliner?: true Has confirmed assistance: true Capacity for the concert: 15 Duration of the concert: 90 Price: 70.0 How many members are there in the group?: 6 Do they sell merchandising?: true
Name: Ozuna Genre: reggaeton Is a headliner?: false Has confirmed assistance: false Capacity for the concert: 20 Duration of the concert: 75 Price: 50.0Do they need a dressing room?: false Manager phone number: 666777222
Name: Rihanna Genre: pop Is a headliner?: true Has confirmed assistance: true Capacity for the concert: 40 Duration of the concert: 90 Price: 150.0Do they need a dressing room?: true Manager phone number: 787878787
```

2. Calculates how much Evento Seguro S.L. would charge (all parameters are already part of the code, as they have been given in the requirements and is not up to us)

```
2
It would cost 122500.0 euros
```

3. Calculates the cost of a ticket. First it asks for who the ticket is (so not registered attendees cannot check prices) and after, it will ask whose concert you want to attend (so it checks that the artist exists). After checking, it will show the initial price, the discounts that that attendee can have, and the final price.

```
3
Please, introduce your ID:
55551111K
Alright. Which concert do you want to attend to?:
Maneskin
Tickets were originally: 70.0 after a discount of: 0.25%, the final price is: 52.5 euros.
```

4. Estimates how much a certain attendee would spend if they attended all confirmed headliner concerts and bought merchandise in the stands of the confirmed artists who sell merchandising

```
4
Please, introduce your ID:
55551111K
They would spend: 356.25 euros
```

5. Buy the tickets. First it will ask for the attendee ID, and in case they are not registered, the system will request their personal information to be able to buy the tickets. Then it asks how many tickets will be bought and for which artist

```
5
Please, introduce your ID:
55551111K
How many tickets do you want to buy?:
2
What Artist do you want to buy tickets for?
Maneskin
Tickets were originally: 70.0 after a discount of: 0.25%, the final price is: 52.5 euros.
Ticket bought for Maneskin. Thanks!
What Artist do you want to buy tickets for?
Korn
Tickets were originally: 70.0 after a discount of: 0.25%, the final price is: 52.5 euros.
Ticket bought for Korn. Thanks!
```

6. Show all the information regarding the tickets someone has

```
6
Please, introduce your ID:
55551111K
Ticket ID: 741 Artist info: Name: Maneskin Genre: rock Is a headliner?: false Has confirmed assistance: true Capacity for the concert: 15 Duration of the concert: 90 Price: 70.0 How many members are there in the group?: 4 Do they sell merchandising?: true

Ticket ID: 916 Artist info: Name: Korn Genre: metal Is a headliner?: true Has confirmed assistance: true Capacity for the concert: 15 Duration of the concert: 90 Price: 70.0 How many members are there in the group?: 6 Do they sell merchandising?: true
```

7. Show all the information about concerts where there will be VIP attendees

```
7
Name: Maneskin Genre: rock Is a headliner?: false Has confirmed assistance: true Capacity for the concert: 15 Duration of the concert: 90 Price: 70.0 How many members are there in the group?: 4 Do they sell merchandising?: true
Name: Korn Genre: metal Is a headliner?: true Has confirmed assistance: true Capacity for the concert: 15 Duration of the concert: 90 Price: 70.0 How many members are there in the group?: 6 Do they sell merchandising?: true
```

8. Exits the programme

The code is available at https://github.com/paticama/musicFestival.