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**Coursework 2 submission for  
Software Development 2  
(SET08108 2016-7)**

1. **Source code: PersonComponent.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Abstract component class used to make sure that

\* components and decorators share the same specification

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public abstract class PersonComponent

{

/\*

\* Must return the PersonComponent's name.

\*/

public abstract String Name { get; }

/\*

\* Returns the PersonComponent's address (null if the

\* PersonComponent is not a customer).

\*/

public virtual String GetAddress()

{

return null;

}

/\*

\* Returns the PersonComponent's customer number (-1 if the

\* PersonComponent is not a customer).

\*/

public virtual int GetCustNb()

{

return -1;

}

/\*

\* Returns the PersonComponent's passport number (null if the

\* PersonComponent is not a customer).

\*/

public virtual String GetPassportNb()

{

return null;

}

/\*

\* Returns the PersonComponent's age (-1 if the

\* PersonComponent is not a customer).

\*/

public virtual int GetAge()

{

return -1;

}

/\*

\* Returns the PersonComponent itself; and references is null.

\*/

public virtual PersonComponent Unwrap(

out List<PersonDecorator> references)

{

references = null;

return this;

}

/\*

\* Returns true if the PersonComponent wraps another

\* BookingDecorator, otherwise false.

\*/

public virtual bool isDecorator()

{

return false;

}

/\*

\* Returns the PersonComponent itself.

\*/

public virtual PersonComponent Undecorate(PersonDecorator reference)

{

return this;

}

/\*

\* Returns the PersonComponent itself.

\*/

public virtual PersonComponent UndecorateOnce()

{

return this;

}

/\*

\* Must return a textual representation of the

\* PersonComponent in order to persist it to a CSV file.

\*/

public abstract String ToCSV();

/\*

\* Returns false.

\*/

public virtual bool IsCustomer()

{

return false;

}

/\*

\* Returns false.

\*/

public virtual bool IsGuest()

{

return false;

}

}

}

1. **Source code: Person.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Represents individuals.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class Person : PersonComponent

{

// PROPERTIES:

private String name;

public override String Name

{

get

{

return this.name;

}

}

// METHODS:

/\*

\* Constructor.

\*

\* throws ArgumentException if firstName or secondName is null or

\* equals String.Empty

\*/

public Person(String name)

{

if (String.IsNullOrEmpty(name))

{

throw new ArgumentException("ConcretePerson.Name must not"

+ " be null nor String.Empty");

}

this.name = name;

}

/\*

\* Returns a textual representation of the Person object

\* in order to persist it to a CSV file; fields must come

\* in the same order as enumerated in PersonFields.cs

\*/

public override String ToCSV()

{

return "#PERSON\r\n" + Name + "\r\n";

}

}

}

1. **Source code: PersonDecorator.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Abstract class defining the minimum implementation of

\* a concrete PersonDecorator.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public abstract class PersonDecorator : PersonComponent

{

// PROPERTIES:

// the decorated component

protected PersonComponent decoratedComponent;

public void SetComponent(PersonComponent p)

{

decoratedComponent = p;

}

// the PersonDecorator's name (is null if the root component is not

// a concrete Person)

public override string Name

{

get

{

String name = null;

if (decoratedComponent != null)

{

name = decoratedComponent.Name;

}

return name;

}

}

// METHODS:

/\*

\* Returns the PersonDecorator's Address (is null if the root

\* component is not a concrete Person)

\*/

public override string GetAddress()

{

String address = null;

if (decoratedComponent != null)

// && decoratedComponent.GetType() != typeof(Person))

{

address = decoratedComponent.GetAddress();

}

return address;

}

/\*

\* Returns the PersonDecorator's customer number (-1 if the root

\* component is not a concrete Person)

\*/

public override int GetCustNb()

{

int custNb = -1;

if (decoratedComponent != null)

{

custNb = decoratedComponent.GetCustNb();

}

return custNb;

}

/\*

\* Returns the PersonDecorator's passport number (is null if the root

\* component is not a concrete Person)

\*/

public override string GetPassportNb()

{

String passportNb = null;

if (decoratedComponent != null)

// && decoratedComponent.GetType() != typeof(Person))

{

passportNb = decoratedComponent.GetAddress();

}

return passportNb;

}

/\*

\* Returns the PersonDecorator's age (-1 if the root

\* component is not a concrete Person)

\*/

public override int GetAge()

{

int age = -1;

if (decoratedComponent != null)

{

age = decoratedComponent.GetCustNb();

}

return age;

}

/\*

\* Returns the root PersonComponent of the decoration stack;

\* references outputs a list of pointers to all the PersonDecorator

\* instances in the decoration stack.

\*/

public override PersonComponent Unwrap(

out List<PersonDecorator> references)

{

PersonComponent component = this;

List<PersonDecorator> decorators = new List<PersonDecorator>();

while (component.isDecorator())

{

decorators.Add((PersonDecorator)component);

component = ((PersonDecorator)component).decoratedComponent;

}

references = decorators;

return component;

}

/\*

\* Returns true if the PersonDecorator wraps another

\* PersonDecorator, otherwise false.

\*/

public override bool isDecorator()

{

return this.decoratedComponent != null;

}

/\*

\* Returns a reference to a new PersonComponent identical in content

\* to calling instance, except unwraped from the PersonDecorator

\* passed as a parameter (or the to the Booking itself if it is not

\* decorated at all).

\*/

public override PersonComponent Undecorate(PersonDecorator reference)

{

if (this == reference) return decoratedComponent;

/\* Short circuit method if the decorator to remove is the

\* last one added.

\*/

List<PersonDecorator> references;

PersonComponent result = this.Unwrap(out references);

foreach (PersonDecorator decorator in references)

{

if (decorator != reference)

{

decorator.decoratedComponent = result;

result = decorator;

}

}

return result;

}

/\*

\* Peels a single layer of decoration by returning the decorator's

\* decorated component.

\*/

public override PersonComponent UndecorateOnce()

{

if (decoratedComponent != null)

{

return decoratedComponent;

}

else

{

return this;

}

}

/\*

\* Returns a textual representation of the decorated

\* PersonComponent in order to persist it to a CSV file.

\*/

public override String ToCSV()

{

String csv = String.Empty;

if (decoratedComponent != null)

{

csv = decoratedComponent.ToCSV();

}

return csv;

}

/\*

\* Returns true if the PersonComponent is a Customer, otherwise false.

\*/

public override bool IsCustomer()

{

bool isCustomer = false;

if (decoratedComponent != null)

{

isCustomer = decoratedComponent.IsCustomer();

}

return isCustomer;

}

/\*

\* Returns true if the PersonComponent is a Guest, otherwise false.

\*/

public override bool IsGuest()

{

bool isGuest = false;

if (decoratedComponent != null)

{

isGuest = decoratedComponent.IsGuest();

}

return isGuest;

}

}

}

1. **Source code: Customer.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Represents a customer.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class Customer : PersonDecorator

{

// PROPERTIES:

private String address;

public override String GetAddress()

{

return this.address;

}

private int customerNb;

public override int GetCustNb()

{

return this.customerNb;

}

// METHODS:

/\*

\* Constructor.

\*

\* throws ArgumentException if customerRefNb is not strictly greater

\* than 0, or if address equals either String.Empty or null

\*/

public Customer(String address, int customerRefNb)

{

if (String.IsNullOrEmpty(address))

{

throw new ArgumentException("Customer.address"

+ " must not be null nor"

+ " String.Empty");

}

if (customerRefNb <= 0)

{

throw new ArgumentException("Customer.customerRefNb must be"

+ " strictly greater than 0");

}

this.address = address;

this.customerNb = customerRefNb;

}

/\*

\* Returns a textual representation of the decorated Person

\* (post Guest decoration) in order to persist it to a CSV file;

\* fields must come in the same order as enumerated in

\* CustomerFields.cs

\*/

public override String ToCSV()

{

return base.ToCSV() + "#CUSTOMER\r\n"

+ customerNb

+ ","

+ address

+ "\r\n";

}

/\*

\* Returns true.

\*/

public override bool IsCustomer()

{

return true;

}

/\*

\* Returns true if the Customer is also a Guest, otherwise flase

\*/

public override bool IsGuest()

{

return base.IsGuest();

}

}

}

1. **Source code: Guest.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Represents a guest.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class Guest : PersonDecorator

{

// PROPERTIES:

private String passportNb;

public override String GetPassportNb()

{

return this.passportNb;

}

private int age;

public override int GetAge()

{

return this.age;

}

// METHODS:

/\*

\* Constructor.

\*

\* throws ArgumentException if age is lesser than zero, or if

\* passportNb equals String.Empty or null

\*/

public Guest(String passportNb, int age)

{

if (String.IsNullOrEmpty(passportNb))

{

throw new ArgumentException("ConcreteDecoratorGuest.passportNb"

+ " must not be null nor"

+ " String.Empty");

}

if (age < 0)

{

throw new ArgumentException("ConcreteDecoratorGuest.age must"

+ " not be lesser than 0");

}

this.passportNb = passportNb;

this.age = age;

}

/\*

\* Returns a textual representation of the decorated ConcretePerson

\* (post Guest decoration) in order to persist it to a CSV file;

\* fields must come in the same order as enumerated in GuestFields.cs

\*/

public override String ToCSV()

{

return base.ToCSV() + "#GUEST\r\n"

+ passportNb

+ ","

+ age

+ "\r\n";

}

/\*

\* Returns true if the Guest is also a Customer, otherwise flase

\*/

public override bool IsCustomer()

{

return base.IsCustomer();

}

/\*

\* Returns true.

\*/

public override bool IsGuest()

{

return true;

}

}

}

1. **Source code: PersonFactory.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Singleton utility class, instantiates and decorates

\* PersonComponents.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class PersonFactory

{

//Properties:

private int nextCustNb;

private static PersonFactory instance;

public static PersonFactory Instance

{

get

{

if (instance == null)

{

instance = new PersonFactory();

}

return instance;

}

}

/\*

\* Private constructor, to prevent class instantiation from

\* external classes (singleton class).

\*/

private PersonFactory()

{

this.nextCustNb = 1;

}

/\*

\* Restores the factory state according to sysData values.

\* Returns true if restore was successful, otherwise false.

\*/

public bool Restore(Dictionary<String, String> sysData)

{

String nxtBookNbString;

bool outcome;

outcome = sysData.TryGetValue(

BookingFactoryField.NEXT\_BOOKING\_NB.ToString(),

out nxtBookNbString);

outcome = Int32.TryParse(nxtBookNbString, out this.nextCustNb);

return outcome;

}

/\*

\* Generates a new customer instance on the basis of the data

\* passed as parameters.

\*/

public PersonComponent GetNewCustomer(String name, String address)

{

PersonComponent p = new Person(name);

PersonDecorator c = new Customer(address, this.nextCustNb);

this.nextCustNb++;

c.SetComponent(p);

return c;

}

/\*

\* Returns a reference to the updated PersonComponent instance.

\*/

public PersonComponent UpdateCustomer(PersonComponent customer,

String newName,

String newAddress)

{

// create a fresh customer with the new values but same customerNb

PersonComponent p = new Person(newName);

PersonDecorator c = new Customer(newAddress, customer.GetCustNb());

c.SetComponent(p);

// get all decorators of customer being updated

List<PersonDecorator> decorators;

customer.Unwrap(out decorators);

// decorate the new customer with those decorators except those

// of type 'Customer'

foreach (PersonDecorator decorator in decorators)

{

if (decorator.GetType() != typeof(Customer))

{

decorator.SetComponent(c);

c = decorator;

}

}

return c;

}

/\*

\* Instantiates a Customer from a dictonary<attribute, values>,

\* presumably recovered from persisted data (the dictonary keys

\* should follow the naming implemented in the \*Field.cs enumerations)

\*

\* Thows Argument exceptions if there is a problem with the contents

\* of the dictionary passed as a parameter.

\*/

public PersonDecorator RestoreCustomer(

Dictionary<String, String> attributes)

{

String name;

String address;

String custRef;

int custRefNb;

String passportNb;

String ageString;

int age;

if (!attributes.TryGetValue("NAME", out name)

|| !attributes.TryGetValue("ADDRESS", out address)

|| !attributes.TryGetValue("CUSTOMER\_NUMBER", out custRef))

{

throw new ArgumentException("the attributes dictonary doesn't"

+ " have the expected keys.");

}

if (!Int32.TryParse(custRef, out custRefNb))

{

throw new ArgumentException("impossible to parse "

+ "[key: CUSTOMER\_NUMBER, value: "

+ custRef + "] to type Int32.");

}

PersonDecorator c = new Customer(address, custRefNb);

c.SetComponent(new Person(name));

PersonDecorator g;

if (attributes.TryGetValue("PASSPORT\_NUMBER", out passportNb)

&& attributes.TryGetValue("AGE", out ageString))

{

if (!Int32.TryParse(ageString, out age))

{

throw new ArgumentException("impossible to parse "

+ "[key: AGE, "

+ " value: "+ ageString

+ "] to type Int32.");

}

g = new Guest(passportNb, age);

g.SetComponent(c);

}

else

{

g = c;

}

return g;

}

/\*

\* Generates a new guest instance on the basis of the data

\* passed as parameters.

\*/

public PersonComponent GetNewGuest(String name,

String passportNb,

int age)

{

Person p = new Person(name);

Guest g = new Guest(passportNb, age);

g.SetComponent(p);

return g;

}

/\*

\* Generates a new guest instance on the basis of the data

\* passed as parameters.

\*/

public PersonComponent GetNewGuest(

PersonComponent customer,

String passportNb,

int age)

{

Guest g = new Guest(passportNb, age);

g.SetComponent(customer);

return g;

}

/\*

\* Instantiates a Guest from a dictonary<attribute, values>,

\* presumably recovered from persisted data (the dictonary keys

\* should follow the naming implemented in the \*Field.cs enumerations)

\*

\* Thows Argument exceptions if there is a problem with the contents

\* of the dictionary passed as a parameter.

\*/

public PersonComponent RestoreGuest(

Dictionary<String, String> attributes)

{

String name;

String passportNb;

String ageString;

int age;

if (!attributes.TryGetValue("NAME", out name)

|| !attributes.TryGetValue("AGE", out ageString)

|| !attributes.TryGetValue("PASSPORT\_NUMBER", out passportNb))

{

throw new ArgumentException("the attributes dictonary doesn't"

+ " have the expected keys.");

}

if (!Int32.TryParse(ageString, out age))

{

throw new ArgumentException("impossible to parse "

+ "[key: AGE, value: " + ageString

+ "] to type Int32.");

}

Guest g = new Guest(passportNb, age);

g.SetComponent(new Person(name));

return g;

}

/\*

\* Returns a textual representation of the PersonFactory object

\* in order to persist it to a CSV file.

\*/

public String ToCSV()

{

return "#PERSON\_FACTORY\r\n" + nextCustNb + "\r\n";

}

}

}

1. **Source code: BookingComponent.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Abstract component class used to make sure that

\* components and decorators share the same specification

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public abstract class BookingComponent

{

/\*

\* Must add a guest to a given BookingComponent.

\*/

public abstract void AddGuest(PersonComponent guest);

/\*

\* Must return the Booking number.

\*/

public abstract int GetBookingNb();

/\*

\* Must return the Booking's cutomer.

\*/

public abstract PersonComponent GetCustomer();

/\*

\* Must return the Booking's list of guests.

\*/

public abstract List<PersonComponent> GetGuests();

/\*

\* Must return the number of guests included in this

\* BookingComponent.

\*/

public abstract int GetNbGuests();

/\*

\* Must return the Booking start and end dates.

\*/

public abstract void GetDates(out DateTime arrival,

out DateTime departure);

/\*

\* Must return the number of nights booked.

\*/

public abstract int GetNbNights();

/\*

\* Must return the the cost for each individual night booked.

\*/

public abstract float GetCostPerNight();

/\*

\* Returns the BookingComponent itself; and references is null.

\*/

public virtual BookingComponent Unwrap(

out List<BookingDecorator> references)

{

references = null;

return this;

}

/\*

\* Returns true if the BookingDecorator wraps another

\* BookingDecorator, otherwise false.

\*/

public virtual bool isDecorator()

{

return false;

}

/\*

\* Returns the BookingComponent itself.

\*/

public virtual BookingComponent Undecorate(BookingDecorator reference)

{

return this;

}

/\*

\* Must return a textual representation of the

\* BookingComponent in order to persist it to a CSV file.

\*/

public abstract String ToCSV();

}

}

1. **Source code: Booking.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Represents a booking.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class Booking : BookingComponent

{

// PROPERTIES:

// the booking reference number.

private int bookingNb;

public override int GetBookingNb()

{

return this.bookingNb;

}

// the booking's customer.

private PersonComponent cust;

public override PersonComponent GetCustomer()

{

return this.cust;

}

// the booking start and end dates.

private DateTime arrival;

private DateTime departure;

public override void GetDates(out DateTime arrival,

out DateTime departure)

{

arrival = this.arrival;

departure = this.departure;

}

//the booking's list of guests.

private List<PersonComponent> guests = new List<PersonComponent>();

public override List<PersonComponent> GetGuests()

{

return this.guests;

}

// METHODS:

/\*

\* Constructor.

\*

\* throws ArgumentException if bookingNb is not strictly greater

\* than 0, if departure day is not strictly later than arrival

\* day, or if customer is not decorated as a customer.

\*/

public Booking(int bookingNb,

PersonComponent customer,

DateTime arrival,

DateTime departure)

{

if (customer.GetCustNb() <= 0)

{

throw new ArgumentException("Booking.cust must be"

+ " decorated as a Customer");

}

if (bookingNb <= 0)

{

throw new ArgumentException("Booking.bookingNb must be"

+ " strictly greater than 0");

}

if (departure.DayOfYear <= arrival.DayOfYear

&& departure.Year <= arrival.Year)

{

throw new ArgumentException("departure day must be strictly"

+ " later than arrival day");

}

this.bookingNb = bookingNb;

this.cust = customer;

this.arrival = arrival;

this.departure = departure;

}

/\*

\* True if the contents of both bookings are identical, otherwise

\* false

\*/

public override bool Equals(object obj)

{

// self check

if (this == obj) return true;

// null check

if (obj == null) return false;

// type check and cast

if (this.GetType() != obj.GetType()) return false;

Booking b = (Booking)obj;

// attribute content comparison

return this.bookingNb == b.bookingNb

&& this.cust == b.cust

// only checking reference equality because i am lacking

// the time to implement customer 'deep' equallity check

&& this.arrival == b.arrival

&& this.departure == b.departure;

}

/\*

\* Adds a guest to the booking.

\*

\* Throws ArgumentException if there is already 4 guests added to

\* the booking.

\*/

public override void AddGuest(PersonComponent guest)

{

if (guests.Count >= 4)

{

throw new ArgumentException("this booking already has"

+ " 4 guests");

}

this.guests.Add(guest);

}

/\*

\* Returns the number of guests included in this Booking.

\*/

public override int GetNbGuests()

{

return guests.Count;

}

/\*

\* Returns the number of nights booked.

\*/

public override int GetNbNights()

{

return (departure - arrival).Days;

}

/\*

\* Returns the cost for each individual night booked.

\*/

public override float GetCostPerNight()

{

float costPerNight = 0;

foreach (PersonComponent g in guests)

{

if (g.GetAge() < 18)

{

costPerNight += 30;

}

else

{

costPerNight += 50;

}

}

return costPerNight;

}

/\*

\* Returns a textual representation of the Booking in order

\* to persist it to a CSV file.

\*/

public override String ToCSV()

{

int custIndex = indexOfCustomer();

StringBuilder csvBooking = new StringBuilder("#BOOKING\r\n");

csvBooking.Append(bookingNb + ",");

csvBooking.Append(arrival.ToString().Substring(0, 10) + ",");

csvBooking.Append(departure.ToString().Substring(0, 10) + "\r\n");

if (custIndex >= 0)

{

csvBooking.Append(guests.ElementAt(custIndex).ToCSV());

}

else

{

csvBooking.Append(cust.ToCSV());

}

if (GetNbGuests() > 0)

{

foreach (Guest g in guests)

{

if (guests.IndexOf(g) != custIndex)

{

csvBooking.Append(g.ToCSV());

}

}

}

return csvBooking.ToString();

}

/\*

\* Returns the index of the element that is also a customer in

\* list of guests, or -1 if none is.

\*/

private int indexOfCustomer()

{

int i = -1;

foreach (Guest g in guests)

{

if (g.IsCustomer())

{

i = guests.IndexOf(g);

}

}

return i;

}

}

}

1. **SourceCode: BookingDecorator.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

// temp

using System.Windows;

namespace Program

{

/\* Abstract class defining the minimum implementation of

\* a concrete BookingDecorator.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public abstract class BookingDecorator : BookingComponent

{

// PROPERTIES:

// the BookingDecorator component

protected BookingComponent decoratedComponent { get; set; }

public void Setcomponent(BookingComponent booking)

{

decoratedComponent = booking;

}

// METHODS:

/\*

\* Adds a guest to the decorated booking.

\*/

public override void AddGuest(PersonComponent guest)

{

if (decoratedComponent != null)

{

decoratedComponent.AddGuest(guest);

}

}

/\*

\* Returns the decorated BookingComponent's list of booking number

\* (or -1 if the root component is not a concrete Booking).

\*/

public override int GetBookingNb()

{

int bookingNb = -1;

if (decoratedComponent != null)

{

bookingNb = decoratedComponent.GetBookingNb();

}

return bookingNb;

}

/\*

\* Returns the decorated BookingComponent's customer

\* (or null if the root component is not a concrete Booking).

\*/

public override PersonComponent GetCustomer()

{

PersonComponent customer = null;

if (decoratedComponent != null)

{

customer = decoratedComponent.GetCustomer();

}

return customer;

}

/\*

\* Returns the decorated BookingComponent's list of guests

\* (or null if the root component is not a concrete Booking).

\*/

public override List<PersonComponent> GetGuests()

{

List<PersonComponent> guests = null;

if (decoratedComponent != null)

{

guests = decoratedComponent.GetGuests();

}

return guests;

}

/\*

\* Returns the root BookingComponent of the decoration stack;

\* references outputs a list of pointers to all the BookingDecorator

\* instances in the decoration stack.

\*/

public override BookingComponent Unwrap(

out List<BookingDecorator> references)

{

BookingComponent component = this;

List<BookingDecorator> decorators = new List<BookingDecorator>();

while (component.isDecorator())

{

decorators.Add((BookingDecorator)component);

component = ((BookingDecorator)component).decoratedComponent;

}

references = decorators;

return component;

}

/\*

\* Returns true if the BookingDecorator wraps another

\* BookingDecorator, otherwise false.

\*/

public override bool isDecorator()

{

return this.decoratedComponent != null;

}

/\*

\* Returns a reference to a new BookingComponent identical in content

\* to calling instance, except unwraped from the BookingDecorator

\* passed as a parameter (or the to the Booking itself if it is not

\* decorated at all).

\*/

public override BookingComponent Undecorate(BookingDecorator reference)

{

if (this == reference) return decoratedComponent;

/\* Short circuit method if the decorator to remove is the

\* last one added.

\*/

List<BookingDecorator> references;

BookingComponent result = this.Unwrap(out references);

foreach (BookingDecorator decorator in references)

{

if (decorator != reference)

{

decorator.decoratedComponent = result;

result = decorator;

}

}

return result;

}

/\*

\* Returns the booking start and end dates, or 01/01/1970 for both

\* if an error occurs.

\*/

public override void GetDates(out DateTime arrival,

out DateTime departure)

{

DateTime a = new DateTime(1970, 1, 1);

DateTime d = new DateTime(1970, 1, 1);

if (decoratedComponent != null)

{

decoratedComponent.GetDates(out a, out d);

}

arrival = a;

departure = d;

}

/\*

\* Returns the number of guests included in the decorated

\* BookingComponent (or -1 if the root component is not a

\* concrete Booking).

\*/

public override int GetNbGuests()

{

int nbGuests = -1;

if (decoratedComponent != null)

{

nbGuests = decoratedComponent.GetNbGuests();

}

return nbGuests;

}

/\*

\* Returns the number of nights included in the decorated

\* BookingComponent (or -1 if the root component is not a

\* concrete Booking).

\*/

public override int GetNbNights()

{

int nbNights = -1;

if (decoratedComponent != null)

{

nbNights = decoratedComponent.GetNbNights();

}

return nbNights;

}

/\*

\* Returns the cost for each individual night booked

\* (or -1 if the root component is not a concrete Booking).

\*/

public override float GetCostPerNight()

{

float costPerNight = -1;

if (decoratedComponent != null)

{

costPerNight = decoratedComponent.GetCostPerNight();

}

return costPerNight;

}

/\*

\* Returns the cost of the decorated BookingComponent

\* (or -1 if the root component is not a concrete Booking).

\*/

public virtual float GetExtraCost()

{

float cost = -1;

if (decoratedComponent != null

&& decoratedComponent.isDecorator())

{

cost = ((BookingDecorator)decoratedComponent).GetExtraCost();

}

return cost;

}

/\*

\* Returns a textual representation of the decorated

\* BookingDecorator in order to persist it to a CSV file

\* (or String.Empty if the root component is not a

\* concrete Booking).

\*/

public override String ToCSV()

{

String csv = String.Empty;

if (decoratedComponent != null)

{

csv = decoratedComponent.ToCSV();

}

return csv;

}

}

}

1. **SourceCode: Breakfast.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Represents a breakfast extra.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class Breakfast : BookingDecorator

{

// PROPERTIES:

private String dietRequirement;

public String GetDietRequirements()

{

return this.dietRequirement;

}

// METHODS:

/\*

\* Constructor.

\*/

public Breakfast(String dietRequirement)

{

this.dietRequirement = dietRequirement;

}

/\*

\* Returns the extra cost of the breakfasts.

\*/

public override float GetExtraCost()

{

return 5 \* base.decoratedComponent.GetNbGuests()

\* base.decoratedComponent.GetNbNights();

}

/\*

\* Returns a textual representation of the decorated

\* BookingDecorator in order to persist it to a CSV file.

\*/

public override String ToCSV()

{

return base.ToCSV() + "#BREAKFAST\r\n"

+ dietRequirement

+ "\r\n";

}

}

}

1. **SourceCode: EveningMeal.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Represents an evening meals extra.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class EveningMeal : BookingDecorator

{

// PROPERTIES:

private String dietRequirement;

public String GetDietRequirements()

{

return this.dietRequirement;

}

// METHODS :

/\*

\* Constructor.

\*/

public EveningMeal(String dietRequirement)

{

this.dietRequirement = dietRequirement;

}

/\*

\* Returns the extra cost for the evening meals.

\*/

public override float GetExtraCost()

{

return 15 \* base.decoratedComponent.GetNbGuests()

\* base.decoratedComponent.GetNbNights();

}

/\*

\* Returns a textual representation of the decorated

\* BookingDecorator in order to persist it to a CSV file.

\*/

public override String ToCSV()

{

return base.ToCSV() + "#EVENING\_MEAL\r\n"

+ dietRequirement

+ "\r\n";

}

}

}

1. **SourceCode: CarHire.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Represents a car hire extra.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class CarHire : BookingDecorator

{

// PROPERTIES:

private String driverName;

public String GetDriverName()

{

return this.driverName;

}

private DateTime start;

private DateTime end;

public void GetHireDates(out DateTime start,

out DateTime end)

{

start = this.start;

end = this.end;

}

// METHODS:

/\*

\* Constructor.

\*

\* throws ArgumentException if (String.IsNullOrWhiteSpace(driverName)

\* or if end day is not strictly later than start day

\*/

public CarHire(String driverName, DateTime start, DateTime end)

{

if (String.IsNullOrWhiteSpace(driverName))

{

throw new ArgumentException("CarHire.driverName must not be"

+ " null, whitespace or an"

+ " empty string.");

}

if (end.DayOfYear <= start.DayOfYear

&& end.Year <= start.Year)

{

throw new ArgumentException("end day must be strictly"

+ " later than start day");

}

this.driverName = driverName;

this.start = start;

this.end = end;

}

/\*

\* Returns the extra cost for the car hire.

\*/

public override float GetExtraCost()

{

return 50 \* (end - start).Days;

}

/\*

\* Returns a textual representation of the decorated

\* BookingDecorator in order to persist it to a CSV file.

\*/

public override String ToCSV()

{

StringBuilder csvCarHire = new StringBuilder("#CAR\_HIRE\r\n");

csvCarHire.Append(driverName + ",");

csvCarHire.Append(start.ToString().Substring(0, 10) + ",");

csvCarHire.Append(end.ToString().Substring(0, 10) + "\r\n");

return base.ToCSV() + csvCarHire.ToString();

}

}

}

1. **SourceCode: BookingFactory.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Singleton utility class, instantiates and decorates

\* BookingComponents.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class BookingFactory

{

//PROPERTIES:

// the next booking unique number:

private int nxtBookingNb;

// points to the PersonFactory instance.

private PersonFactory personFactory = PersonFactory.Instance;

// the singleton instance porperty

private static BookingFactory instance;

public static BookingFactory Instance

{

get

{

if (instance == null)

{

instance = new BookingFactory();

}

return instance;

}

}

// METHODS

/\*

\* Private constructor, to prevent class instantiation from

\* external classes (singleton class).

\*/

private BookingFactory()

{

this.nxtBookingNb = 1;

}

/\*

\* Restores the factory state according to sysData values.

\* Returns true if restore was successful, otherwise false.

\*/

public bool Restore(Dictionary<String, String> sysData)

{

String nxtBookNbString;

bool outcome;

outcome = sysData.TryGetValue(

PersonFactoryField.NEXT\_CUST\_NB.ToString(),

out nxtBookNbString);

outcome = Int32.TryParse(nxtBookNbString, out this.nxtBookingNb);

return outcome;

}

/\*

\* Generates a new booking instance on the basis of the data

\* passed as parameters.

\*/

public BookingComponent GetNewBooking(PersonComponent customer,

DateTime arrival,

DateTime departure)

{

return new Booking(

this.nxtBookingNb++, customer, arrival, departure);

}

/\*

\* Returns a reference to the updated booking instance.

\*/

public BookingComponent UpdateBooking(int bookingNb,

PersonComponent newCustomer,

DateTime newArrival,

DateTime newDeparture)

{

return new Booking(

bookingNb, newCustomer, newArrival, newDeparture);

}

/\*

\* Generates a new booking instance on the basis of the data

\* passed as parameters.

\*/

private BookingComponent getNewBooking(int bookingNb,

PersonComponent customer,

DateTime arrival,

DateTime departure)

{

return new Booking(bookingNb, customer, arrival, departure);

}

/\*

\* Decorates a BookingComponent, wrapping it inside a Breakfast

\* decorator.

\*/

public Breakfast AddBreakfast(BookingComponent booking,

String dietRequirements)

{

Breakfast bf = new Breakfast(dietRequirements);

bf.Setcomponent(booking);

return bf;

}

/\*

\* Decorates a BookingComponent, wrapping it inside an EveningMeal

\* decorator.

\*/

public EveningMeal AddEveningMeal(BookingComponent booking,

String dietRequirements)

{

EveningMeal em = new EveningMeal(dietRequirements);

em.Setcomponent(booking);

return em;

}

/\*

\* Decorates a BookingComponent, wrapping it inside a CarHire

\* decorator.

\*

\* Throws ArgumentException if either hire start or hire end

\* date falls without the booking dates range.

\*/

public CarHire AddCarHire(BookingComponent booking,

String driverName,

DateTime start,

DateTime end)

{

DateTime arrival;

DateTime departure;

booking.GetDates(out arrival, out departure);

if (start < arrival || end > departure)

{

throw new ArgumentException("CarHire start & end dates must"

+ " be within the booking dates"

+ " range.");

}

CarHire ch = new CarHire(driverName, start, end);

ch.Setcomponent(booking);

return ch;

}

/\*

\* Instantiates a BookingComponent from a

\* List<Dictonary<attribute, values>>, presumably recovered from

\* persisted data (the dictonaries keys should follow the naming

\* implemented in the \*Field.cs enumerations)

\*

\* Thows Argument exception if there is a problem with the contents

\* of the dictionary passed as a parameter.

\*/

public BookingComponent Restore(

List<Dictionary<String, String>> booking)

{

BookingComponent result = null;

Dictionary<String, String> bData;

Dictionary<String, String> cData;

List<Dictionary<String, String>> guestsData;

extract(booking, out bData, out cData, out guestsData);

String bookingNb;

String csvArrival;

String csvDeparture;

if (bData != null

&& cData != null

&& bData.TryGetValue(BookingField.BOOKING\_NUMBER.ToString(),

out bookingNb)

&& bData.TryGetValue(BookingField.ARRIVAL.ToString(),

out csvArrival)

&& bData.TryGetValue(BookingField.DEPARTURE.ToString(),

out csvDeparture))

{

result = getNewBooking(Int32.Parse(bookingNb),

personFactory.RestoreCustomer(cData),

Convert.ToDateTime(csvArrival),

Convert.ToDateTime(csvDeparture));

if (result.GetCustomer().IsGuest())

{

result.AddGuest(result.GetCustomer());

}

}

result = addGuestsData(result, guestsData);

result = addExtrasData(result, bData);

return result;

}

/\*

\* Extracts the BookingComponent data, the Customer data and the

\* Guests data from contents of a dictonary<attribute, values>,

\* presumably recovered from persisteddata (the dictonary keys

\* should follow the naming implemented in the \*Field.cs

\* enumerations)

\*/

private void extract(

List<Dictionary<String, String>> booking,

out Dictionary<String, String> bookingData,

out Dictionary<String, String> customerData,

out List<Dictionary<String, String>> guestsData)

{

Dictionary<String, String> bd = null;

Dictionary<String, String> cd = null;

List<Dictionary<String, String>> gd

= new List<Dictionary<String, String>>();

foreach (Dictionary<String, String> d in booking)

{

if (d.ContainsKey(BookingField.BOOKING\_NUMBER.ToString()))

{

bd = d;

}

else

if (d.ContainsKey(CustomerField.CUSTOMER\_NUMBER.ToString()))

{

cd = d;

}

else

{

gd.Add(d);

}

}

bookingData = bd;

customerData = cd;

guestsData = gd;

}

/\*

\* Adds Guests to a BookingComponent according to data contents of a

\* dictonary<attribute, values>, presumably recovered from persisted

\* data (the dictonary keys should follow the naming implemented in

\* the \*Field.cs enumerations)

\*/

private BookingComponent addGuestsData(

BookingComponent b,

List<Dictionary<String, String>> gData)

{

foreach (Dictionary<String, String> d in gData)

{

b.AddGuest(personFactory.RestoreGuest(d));

}

return b;

}

/\*

\* Decorates a BookingComponent according to data contents of a

\* dictonary<attribute, values>, presumably recovered from persisted

\* data (the dictonary keys should follow the naming implemented in

\* the \*Field.cs enumerations)

\*/

private BookingComponent addExtrasData(

BookingComponent b,

Dictionary<String, String> bData)

{

if (b != null

&& bData != null)

{

String s1;

String s2;

String s3;

if (bData.TryGetValue(

BreakfastField.DIET\_REQUIREMENT\_BREAKFAST

.ToString(),

out s1))

{

b = AddBreakfast(b, s1);

}

if (bData.TryGetValue(

EveningMealField.DIET\_REQUIREMENT\_EVENING

.ToString(),

out s1))

{

b = AddEveningMeal(b, s1);

}

if (bData.TryGetValue(CarHireField.DRIVER\_NAME.ToString(),

out s1)

&& bData.TryGetValue(CarHireField.START.ToString(),

out s2)

&& bData.TryGetValue(CarHireField.END.ToString(),

out s3))

{

b = AddCarHire(b,

s1,

Convert.ToDateTime(s2),

Convert.ToDateTime(s3));

}

}

return b;

}

/\*

\* Returns a textual representation of the BookingFactory object

\* in order to persist it to a CSV file.

\*/

public String ToCSV()

{

return "#BOOKING\_FACTORY\r\n" + nxtBookingNb + "\r\n";

}

}

}

1. **SourceCode: DataPersistenceFacade.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

// custom imports:

using System.IO;

namespace Program

{

/\*

\* Utility class, facade for the Data Persistence implementation

\* details.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class DataPersistenceFacade

{

// PROPERTIES:

// the bookings data persistence directory.

private String dataDirectory = @"bookings";

// the system data persistence directory.

private String systemDirectory = @"system";

// the data writer instance:

private CSVWriter dataWriter = CSVWriter.Instance;

// the data reader instance:

private CSVReader dataReader = CSVReader.Instance;

// METHODS RELATED TO BOOKINGS:

/\*

\* Persists the BookingComponent to {dataDirectory}/{bookingNb}.csv;

\* returns true if data was persisted successfuly or false if not.

\*/

public bool Persist(BookingComponent booking)

{

String filePath = (String.Format(@"{0}/{1}.csv",

dataDirectory,

booking.GetBookingNb()));

return dataWriter.Persist(booking, filePath);

}

/\*

\* Builds a List<Dictionary<attribute, value>>, each representing

\* an entity of a given BookingComponent (the dictonary keys are named

\* as defined in the \*Field.cs enumerations);

\* returns true if data was read successfuly, otherwise false.

\*/

public bool Read(int bookingNb,

out List<Dictionary<String, String>> bookingData)

{

String filePath = (String.Format(@"{0}/{1}.csv",

dataDirectory,

bookingNb));

List<Dictionary<String, String>> results;

bool wasSuccessful = dataReader.ReadBooking(filePath, out results);

bookingData = results;

return wasSuccessful;

}

/\*

\* Returns a list of all booking numbers ever persisted.

\*/

public List<int> GetAllBookingNbs()

{

if (!Directory.Exists(dataDirectory))

{

dataWriter.CreateDir(dataDirectory);

}

String[] filePaths = Directory.GetFiles(dataDirectory);

List<int> bookingNbs = new List<int>();

foreach (String fp in filePaths)

{

bookingNbs.Add(extractBookingNb(fp));

}

return bookingNbs;

}

/\*

\* Returns the booking number from given persisted booking file name.

\*/

private int extractBookingNb(String bookingFileName)

{

int start = bookingFileName.LastIndexOf("\\") + 1;

int end = bookingFileName.IndexOf(".") - start;

int bookingNb = -1;

if (end > 0)

{

bookingNb = Int32.Parse(bookingFileName.Substring(start, end));

}

return bookingNb;

}

/\*

\* Deletes the file storing given booking from disc if it

\* exists.

\*/

public void Delete(int bookingNb)

{

String filePath = (String.Format(@"{0}/{1}.csv",

dataDirectory,

bookingNb));

if (File.Exists(filePath))

{

File.Delete(filePath);

}

}

// METHODS RELATED TO CUSTOMERS:

/\*

\* Returns a list of all booking numbers that were made by

\* a given customer.

\*/

public List<int> GetAllBookingNbs(int customerNb)

{

List<int> bookingNbs = new List<int>();

String[] bookingFiles = new String[0];

List<Dictionary<String, String>> bookingData;

String value;

if (Directory.Exists(dataDirectory))

{

bookingFiles = Directory.GetFiles(dataDirectory);

}

foreach (String fPath in bookingFiles)

{

if (dataReader.ReadBooking(fPath, out bookingData))

{

foreach (Dictionary<String, String> d in bookingData)

{

if (d.TryGetValue(CustomerField.CUSTOMER\_NUMBER

.ToString(),

out value)

&& Int32.Parse(value) == customerNb)

{

bookingNbs.Add(extractBookingNb(fPath));

}

}

}

}

return bookingNbs;

}

/\*

\* Returns a list of all the customer numbers persisted to file.

\*/

public List<int> GetAllCustomerNbs()

{

int customerNb;

if (!Directory.Exists(dataDirectory))

{

dataWriter.CreateDir(dataDirectory);

}

List<int> customerNbs = new List<int>();

foreach (String bookingFile in Directory.GetFiles(dataDirectory))

{

customerNb = extractCustomerNb(bookingFile);

if (!customerNbs.Contains(customerNb))

{

customerNbs.Add(customerNb);

}

}

return customerNbs;

}

/\*

\* Returns the customer number from given persisted booking file,

\* or -1 if the file cant be found.

\*/

private int extractCustomerNb(String bookingFile)

{

List<Dictionary<String, String>> bookingData;

if (File.Exists(bookingFile)

&& dataReader.ReadBooking(bookingFile, out bookingData))

{

int customerNb;

String customerNbString;

foreach (Dictionary<String, String> entity in bookingData)

{

if (entity.TryGetValue(CustomerField.CUSTOMER\_NUMBER

.ToString(),

out customerNbString)

&& Int32.TryParse(customerNbString, out customerNb))

{

return customerNb;

/\* short circuit looping and exit method as soon

\* as customer number was found.

\*/

}

}

}

return -1; // or return -1

}

/\*

\* Returns a Dictionary<attribute, value>, representing a Customer.cs

\* instance (the dictonary keys are named as defined in the \*Field.cs

\* enumerations);

\* returns true if data was read successfuly otherwise false.

\*/

public bool Read(int customerNb,

out Dictionary<String, String> customerData)

{

Dictionary<String, String> result = null;

List<int> bookings = GetAllBookingNbs(customerNb);

bool wasSuccessful = false;

if (bookings != null && bookings.Count > 0)

{

int bookingNb = bookings.ElementAt(0);

List<Dictionary<String, String>> bookingData;

String value;

if (this.Read(bookingNb, out bookingData))

{

foreach (Dictionary<String, String> d in bookingData)

{

if (d.TryGetValue(CustomerField.CUSTOMER\_NUMBER

.ToString(),

out value)

&& Int32.Parse(value) == customerNb)

{

result = d;

wasSuccessful = true;

}

}

}

}

customerData = result;

return wasSuccessful;

}

// METHODS RELATED TO SYSTEM STATE:

/\*

\* Restores system state from file.

\*/

public bool PersistSystemState()

{

String personFactoryPath = (String.Format(@"{0}/{1}.csv",

systemDirectory,

"person-factory"));

String bookingFactoryPath = (String.Format(@"{0}/{1}.csv",

systemDirectory,

"booking-factory"));

return dataWriter.Persist(PersonFactory.Instance,

personFactoryPath)

&& dataWriter.Persist(BookingFactory.Instance,

bookingFactoryPath);

}

/\*

\* Returns a Dictionary<attribute, value>, representing the last

\* system state saved (the dictonary keys are named as defined in the

\* SystemField.cs enumeration);

\* returns true if data was read successfuly otherwise false.

\*/

public bool ReadSystemState(out Dictionary<String, String> sysData)

{

return dataReader.ReadSystemState(systemDirectory, out sysData);

}

}

}

1. **SourceCode: CSVWriter.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

// Custom imports:

using System.IO;

namespace Program

{

/\*

\* Singleton utility class, persists booking data to CSV files.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class CSVWriter

{

// PROPERTIES:

// the singleton instance property

private static CSVWriter instance;

public static CSVWriter Instance

{

get

{

if (instance == null)

{

instance = new CSVWriter();

}

return instance;

}

}

// METHODS

/\*

\* Private constructor, to prevent class instantiation from

\* external classes (singleton class).

\*/

private CSVWriter() { }

/\*

\* Persists the BookingComponent to given filePath, returns true if

\* data was persisted successfuly or false if not.

\*/

public bool Persist(BookingComponent booking, String filePath)

{

String dataDirName = Path.GetDirectoryName(filePath);

if (!Directory.Exists(dataDirName))

{

CreateDir(dataDirName);

}

if (File.Exists(filePath))

{

File.Delete(filePath);

}

try

{

System.IO.File.AppendAllText(filePath, booking.ToCSV());

}

catch

{

return false;

}

return true;

}

public void CreateDir(String dirPath)

{

Directory.CreateDirectory(dirPath);

}

/\*

\* Persists the PersonFactory to given filePath, returns true if

\* data was persisted successfuly or false if not.

\*/

public bool Persist(PersonFactory pf, String filePath)

{

String dataDirName = Path.GetDirectoryName(filePath);

if (!Directory.Exists(dataDirName))

{

Directory.CreateDirectory(dataDirName);

}

if (File.Exists(filePath))

{

File.Delete(filePath);

}

try

{

System.IO.File.AppendAllText(filePath, pf.ToCSV());

}

catch

{

return false;

}

return true;

}

/\*

\* Persists the PersonFactory to given filePath, returns true if

\* data was persisted successfuly or false if not.

\*/

public bool Persist(BookingFactory bf, String filePath)

{

String dataDirName = Path.GetDirectoryName(filePath);

if (!Directory.Exists(dataDirName))

{

Directory.CreateDirectory(dataDirName);

}

if (File.Exists(filePath))

{

File.Delete(filePath);

}

try

{

System.IO.File.AppendAllText(filePath, bf.ToCSV());

}

catch

{

return false;

}

return true;

}

}

}

1. **SourceCode: CSVReader.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

// Custom imports:

using System.IO;

namespace Program

{

/\*

\* Singleton utility class, reads bookings data from CSV files.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public class CSVReader

{

// PROPERTIES:

// the singleton instance property

private static CSVReader instance;

public static CSVReader Instance

{

get

{

if (instance == null)

{

instance = new CSVReader();

}

return instance;

}

}

// METHODS

/\*

\* Private constructor, to prevent class instantiation from

\* external classes (singleton class).

\*/

private CSVReader() { }

/\*

\* Outputs a Dictionary<String, String> data of the last system state

\* persisted (the dictonary keys naming follows the naming implemented

\* in the \*Field.cs enumerations).

\* Returns true if data was recovered successfuly, otherwise false.

\*/

public bool ReadSystemState(String sysDirectory,

out Dictionary<String, String> sysData)

{

bool wasSuccessful = true;

List<String> sysFilesLines = new List<String>();

Dictionary<String, String> data = new Dictionary<string,string>();

String[] tmp1;

String[] tmp2;

try

{

foreach (String file in Directory.GetFiles(sysDirectory))

{

sysFilesLines.AddRange(readLines(file));

}

for (int i = 0; i < sysFilesLines.Count; i += 2)

{

tmp1 = new String[2];

tmp2 = sysFilesLines.ElementAt(i + 1).Split(',');

tmp1[1] = tmp2[0];

if (sysFilesLines.ElementAt(i)

.Equals("#PERSON\_FACTORY"))

{

data = join(data, index<PersonFactoryField>(tmp1));

}

else if (sysFilesLines.ElementAt(i)

.Equals("#BOOKING\_FACTORY"))

{

data = join(data, index<BookingFactoryField>(tmp1));

}

}

}

catch

{

wasSuccessful = false;

}

sysData = data;

return wasSuccessful;

}

/\*

\* Outputs a List<Dictionary<String, String>>, each instance of which

\* stores an entity of a BookingComponent as <attribute, value> (the

\* dictonary keys follow the naming implemented in the \*Field.cs

\* enumerations).

\* Returns true if data was recovered successfuly, otherwise false.

\*/

public bool ReadBooking(String filename,

out List<Dictionary<String, String>> keysVals)

{

bool wasSuccessful = true;

List<String[]> extractedEntities;

List<Dictionary<String, String>> indexedEntities = null;

try

{

extractedEntities = extractClasses(readLines(filename));

indexedEntities = new List<Dictionary<String, String>>();

foreach (String[] sArr in extractedEntities)

{

indexedEntities.Add(index(sArr));

}

}

catch

{

wasSuccessful = false;

}

keysVals = indexedEntities;

return wasSuccessful;

}

/\*

\* Reads from a CSV file and returns a list of strings, each

\* corresponding to a line from the file.

\*

\* Throws ArgumentException if the number of lines in the file was not

\* even, as per the CSV formating done within classes.

\*/

private List<String> readLines(String filename)

/\*

\* RESOURCE:

\* https://msdn.microsoft.com/en-us/library/db5x7c0d(v=vs.110).aspx

\*/

{

List<String> csvLines = new List<String>();

String line;

StreamReader sr = new StreamReader(filename);

line = sr.ReadLine();

while (line != null)

{

csvLines.Add(line);

line = sr.ReadLine();

}

sr.Close();

if (csvLines.Count % 2 != 0)

{

throw new ArgumentException("Invalid CSV file: should contain"

+ " an even number of text"

+ " lines");

}

return csvLines;

}

/\*

\* Extracts the different entities from a csv BookingComponent,

\* each representing the data for a different class of that

\* BookingComponent.

\*/

private List<String[]> extractClasses(List<String> csvBooking)

{

List<String[]> csvEntities = new List<String[]>();

String[] booking = null;

String[] person = null;

for (int i = 0; i < csvBooking.Count; i = i+2 )

{

switch (csvBooking.ElementAt(i))

{

case "#BOOKING":

if (person != null)

{

csvEntities.Add(person);

person = null;

}

booking = new String[1] { csvBooking.ElementAt(i) };

booking = append(booking, csvBooking.ElementAt(i + 1)

.Split(','));

break;

case "#BREAKFAST":

case "#EVENING\_MEAL":

case "#CAR\_HIRE":

Array.Resize<String>(ref booking, booking.Length + 1);

booking[booking.Length - 1] = csvBooking.ElementAt(i);

booking = append(booking, csvBooking.ElementAt(i + 1)

.Split(','));

break;

case "#PERSON":

if (person != null)

{

csvEntities.Add(person);

person = null;

}

person = new String[1] { csvBooking.ElementAt(i) };

person = append(person, csvBooking.ElementAt(i + 1)

.Split(','));

break;

case "#CUSTOMER":

case "#GUEST":

Array.Resize<String>(ref person, person.Length + 1);

person[person.Length - 1] = csvBooking.ElementAt(i);

person = append(person, csvBooking.ElementAt(i + 1)

.Split(','));

break;

}

}

csvEntities.Add(booking);

csvEntities.Add(person);

return csvEntities;

}

/\*

\* Appends arr2 at the end of arr1.

\*/

private String[] append(String[] arr1, String[] arr2)

/\*

\* RESOURCES:

\* http://stackoverflow.com/questions/59217/merging-two-arrays-in-net

\* https://msdn.microsoft.com/en-us/library/system.array.copy(v=vs.110).aspx

\*/

{

int appendFrom = arr1.Length;

Array.Resize<String>(ref arr1, arr1.Length + arr2.Length);

Array.Copy(arr2, 0, arr1, appendFrom, arr2.Length);

return arr1;

}

/\*

\* Indexes a csv entity (String[]) into a

\* dictionary<attribute, value>.

\*/

private Dictionary<String, String> index(String[] entity)

{

List<String[]> dividedEntity = divide(entity);

Dictionary<String, String> indexedEntity = null;

foreach (String[] sArr in dividedEntity)

{

switch (sArr[0])

{

case "#BOOKING":

indexedEntity = index<BookingField>(sArr);

break;

case "#BREAKFAST":

indexedEntity = join(indexedEntity,

index<BreakfastField>(sArr));

break;

case "#EVENING\_MEAL":

indexedEntity = join(indexedEntity,

index<EveningMealField>(sArr));

break;

case "#CAR\_HIRE":

indexedEntity = join(indexedEntity,

index<CarHireField>(sArr));

break;

case "#PERSON":

indexedEntity = index<PersonField>(sArr);

break;

case "#CUSTOMER":

indexedEntity = join(indexedEntity,

index<CustomerField>(sArr));

break;

case "#GUEST":

indexedEntity = join(indexedEntity,

index<GuestField>(sArr));

break;

default:

throw new ArgumentException("Can't index entity, "

+ " content of sArr[0] must be"

+ " either #BOOKING or #PERSON");

}

}

return indexedEntity;

}

/\*

\* Divides an entity (String[]) into a List<String[]>, each

\* element of which represents a Component class (from a

\* decorator pattern).

\*/

private List<String[]> divide(String[] entity)

{

List<String[]> dividedEntity = new List<String[]>();

String[] section = new String[0];

foreach (String s in entity)

{

if (s.StartsWith("#"))

{

if (section.Length > 0)

{

dividedEntity.Add(section);

}

section = new String[1];

section[0] = s;

}

else

{

Array.Resize<String>(ref section, section.Length + 1);

section[section.Length-1] = s;

}

}

dividedEntity.Add(section);

return dividedEntity;

}

/\*

\* Indexes part of an entity's attributes (= section) into a

\* dictionary<attribute, value>.

\*/

private Dictionary<String, String> index<T>(String[] entitySection)

{

T[] keysArr = (T[])Enum.GetValues(typeof(T));

Dictionary<String, String> indexedSection

= new Dictionary<String, String>();

foreach (T k in keysArr)

{

indexedSection.Add(

k.ToString(),

entitySection[Array.IndexOf(keysArr, k) + 1]);

}

return indexedSection;

}

/\*

\* Joins two Dictionary<String, String> (Union operation).

\*/

private Dictionary<String, String>

join(Dictionary<String, String> d1, Dictionary<String, String> d2)

/\*

\* RESOURCE:

\* http://stackoverflow.com/questions/59217/merging-two-arrays-in-net

\*/

{

return d1.Union(d2)

.ToDictionary(k => k.Key, v => v.Value);

}

}

}

1. **SourceCode: PersonField.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of Person.cs fields in the order they appear in

\* Person.ToCSV and the persisted file.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum PersonField { NAME }

}

1. **SourceCode: CustomerField.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of Customer.cs fields in the order they appear in

\* Customer.ToCSV and the persisted file.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum CustomerField { CUSTOMER\_NUMBER, ADDRESS }

}

1. **SourceCode: GuestField.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of Guest.cs fields in the order they appear in

\* Guest.ToCSV and the persisted file.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum GuestField { PASSPORT\_NUMBER, AGE }

}

1. **SourceCode: PersonFactoryField.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of PersonFactory.cs fields in the order they

\* appear in PersonFactory.ToCSV() and the persisted file.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum PersonFactoryField { NEXT\_CUST\_NB }

}

1. **SourceCode: BookingField.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of Booking.cs fields in the order they appear in

\* Booking.ToCSV() and the persisted file, excluding the fields

\* defined in PersonField.cs, CustomerField.cs & GuestField.cs

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum BookingField { BOOKING\_NUMBER, ARRIVAL, DEPARTURE }

}

1. **SourceCode: BreakfastField.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of Breafast.cs fields in the order they appear in

\* Breakfast.ToCSV() and the persisted file.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum BreakfastField { DIET\_REQUIREMENT\_BREAKFAST }

}

1. **SourceCode: EveningMealField.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of EveningMeal.cs fields in the order they appear in

\* EveningMeal.ToCSV() and the persisted file.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum EveningMealField { DIET\_REQUIREMENT\_EVENING }

}

1. **SourceCode: CarHireField.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of CarHire.cs fields in the order they appear in

\* CarHire.ToCSV() and the persisted file.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum CarHireField { DRIVER\_NAME, START, END }

}

1. **SourceCode: BookingFactory.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Enumeration of BOookingFactory.cs fields in the order they

\* appear in BookingFactory.ToCSV() and the persisted file.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public enum BookingFactoryField { NEXT\_BOOKING\_NB }

}

1. **SourceCode: ModelFacade.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Program

{

/\*

\* Facade providing an interface to the system.

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-09

\*/

public class ModelFacade

{

// PROPERTIES:

// points to the BookingFactory instance:

private BookingFactory bFact;

public BookingFactory BFact { get { return bFact; } }

// ponts to the PersonFactory instance:

private PersonFactory pFact;

public PersonFactory PFact { get { return pFact; } }

// points to a DataPersistenceFacade object:

private DataPersistenceFacade dpFacade;

public DataPersistenceFacade DPFacade { get { return dpFacade; } }

// points to the BookingComponent current working instance:

public BookingComponent CurrentBook { get; set; }

// points to the PersonComponent current working instance:

public PersonComponent CurrentCust { get; set; }

// METHODS:

/\*

\* Constructor.

\*/

public ModelFacade()

{

bFact = BookingFactory.Instance;

pFact = PersonFactory.Instance;

dpFacade = new DataPersistenceFacade();

Dictionary<String, String> sysData;

if (dpFacade.ReadSystemState(out sysData))

{

bFact.Restore(sysData);

pFact.Restore(sysData);

}

}

/\*

\* Recovers last system state persisted to file.

\*/

public bool RestoreSystemSavedState()

{

return false;

}

/\*

\* Persists current system state to file.

\*/

public bool PersistSystemState()

{

return dpFacade.PersistSystemState();

}

/\*

\* Returns a list of all the booking numbers persisted on disc.

\*/

public List<int> GetAllBookingNbs()

{

return dpFacade.GetAllBookingNbs();

}

/\*

\* Returns a list of all the booking numbers persisted on disc made

\* by a given customer.

\*/

public List<int> GetAllBookingNbs(PersonComponent customer)

{

return dpFacade.GetAllBookingNbs(customer.GetCustNb());

}

/\*

\* Returns a list of all the customer numbers persisted on disc.

\*/

public List<int> GetAllCustomerNbs()

{

return dpFacade.GetAllCustomerNbs();

}

public void DeleteBooking(int bookingNb)

{

dpFacade.Delete(bookingNb);

}

// METHODS RELATED TO CURRENT BOOKING:

/\*

\* True if there is a booking loaded in the system when method is

\* called, otherwise false.

\*/

public bool IsABookingLoaded()

{

return CurrentBook != null;

}

/\*

\* Instanciates a new booking for the current customer.

\*/

public void CreateBooking(DateTime arrival, DateTime departure)

{

CurrentBook = bFact.GetNewBooking(CurrentCust, arrival, departure);

}

/\*

\* Loads the booking matching given booking number into the system

\* (from persisted data).

\* Returns true if the booking was found & loaded successfully,

\* otherwise false.

\*/

public bool RestoreBooking(int bookingNb)

{

bool wasRestored = true;

List<Dictionary<String, String>> bookingData;

if (!dpFacade.Read(bookingNb, out bookingData))

{

wasRestored = false;

}

else

{

CurrentBook = bFact.Restore(bookingData);

CurrentCust = CurrentBook.GetCustomer();

}

return wasRestored;

}

/\*

\* Returns the current booking's booking number, or -1 if no booking

\* is currently loaded.

\*/

public int GetCurrentBookNb()

{

int currentBookingNb = -1;

if (CurrentBook != null)

{

currentBookingNb = CurrentBook.GetBookingNb();

}

return currentBookingNb;

}

/\*

\* Returns the current booking's departure and arrival dates.

\*/

public void GetCurrentBookDates(out DateTime arrival,

out DateTime departure)

{

CurrentBook.GetDates(out arrival, out departure);

}

/\*

\* Returns a list of the names of all the guests currently booked for

\* the current booking.

\*/

public List<String> GetGuestNames()

{

List<String> guestNames = new List<String>();

foreach (PersonComponent g in CurrentBook.GetGuests())

{

guestNames.Add(g.Name);

}

return guestNames;

}

/\*

\* Returns the number of guests currently booked for the current

\* booking(also 0 if no booking is currently loaded).

\*/

public int GetCurrentNbGuests()

{

int nbGuests = 0;

if (CurrentBook != null)

{

nbGuests = CurrentBook.GetNbGuests();

}

return nbGuests;

}

/\*

\* Returns the current booking's number of nights, or -1 if no

\* booking is currently loaded.

\*/

public int GetCurrentNbNights()

{

int nbNights = -1;

if (CurrentBook != null)

{

List<BookingDecorator> extras;

nbNights = CurrentBook.Unwrap(out extras).GetNbNights();

}

return nbNights;

}

/\*

\* Returns the current booking's cost per night, or -1 if no booking

\* is currently loaded.

\*/

public float GetCurrentCostPerNight()

{

float costPerNight = -1;

if (CurrentBook != null)

{

List<BookingDecorator> extras = GetCurrentExtras();

costPerNight = CurrentBook.Unwrap(out extras).GetCostPerNight();

}

return costPerNight;

}

/\*

\* Updates the BookingComponent instance currently loaded in the

\* system.

\*/

public void UpdateBooking(DateTime arrival, DateTime departure)

{

List<PersonComponent> savedGuests = CurrentBook.GetGuests();

List<BookingDecorator> decorationStack;

BookingComponent booking = CurrentBook.Unwrap(out decorationStack);

booking = bFact.UpdateBooking(booking.GetBookingNb(),

CurrentCust,

arrival,

departure);

if (decorationStack != null)

{

foreach (BookingDecorator reference in decorationStack)

{

reference.Setcomponent(booking);

booking = reference;

}

}

CurrentBook = booking;

foreach (PersonComponent g in savedGuests)

{

CurrentBook.AddGuest(g);

}

}

/\*

\* Closes the BookingComponent instance currently loaded in the

\* system.

\*/

public void CurrentBookingClose()

{

CurrentBook = null;

CurrentCust = null;

}

/\*

\* Persists the BookingComponent instance currently loaded in the

\* system to file.

\* Returns true if the booking was saved successfully, otherwise

\* false.

\*/

public bool PersistCurrentBooking()

{

return dpFacade.Persist(CurrentBook);

}

// METHODS RELATED TO THE CURRENT CUSTOMER:

/\*

\* True if a customer is currently loaded in the system, otherwise

\* false

\*/

public bool IsACustomerLoaded()

{

return CurrentCust != null;

}

/\*

\* Instanciates a new customer.

\*/

public void CreateCustomer(String name, String address)

{

CurrentCust = pFact.GetNewCustomer(name, address);

}

/\*

\* Loads the customer matching given customer number into the system

\* (from persisted data).

\* Returns true if the customer was found & loaded successfully,

\* otherwise false.

\*/

public bool RestoreCustomer(int customerNb)

{

bool wasRestored = true;

Dictionary<String, String> customerData;

if (!dpFacade.Read(customerNb, out customerData))

{

wasRestored = false;

}

else

{

CurrentCust = pFact.RestoreCustomer(customerData);

}

return wasRestored;

}

/\*

\* Returns the current booking's customer number, or -1 if no booking

\* is currently loaded.

\*/

public int GetCurrentCustNb()

{

int customerNb = -1;

if (CurrentCust != null)

{

customerNb = CurrentCust.GetCustNb();

}

return customerNb;

}

/\*

\* Returns the current booking's customer name, or null if no booking

\* is currently loaded.

\*/

public String GetCurrentCustName()

{

String customerName = null;

if (CurrentCust != null)

{

customerName = CurrentCust.Name;

}

return customerName;

}

/\*

\* Returns the current booking's customer address, or null if no

\* booking is currently loaded.

\*/

public String GetCurrentCustAdress()

{

String customerAddress = null;

if (CurrentCust != null)

{

customerAddress = CurrentCust.GetAddress();

}

return customerAddress;

}

/\*

\* Updates given customer's details with new values for all bookings

\* of his.

\*/

public void UpdateCurrentCustomer(String newName, String newAddress)

{

BookingComponent processedBooking;

List<PersonComponent> savedGuests;

List<BookingDecorator> decorationStack;

List<Dictionary<String, String>> bookingData;

DateTime arrival;

DateTime departure;

// update values within all persisted bookings made by current

// customer

foreach (int bookingNb

in dpFacade.GetAllBookingNbs(CurrentCust.GetCustNb()))

{

dpFacade.Read(bookingNb, out bookingData);

processedBooking = bFact.Restore(bookingData)

.Unwrap(out decorationStack);

savedGuests = processedBooking.GetGuests();

processedBooking.GetDates(out arrival, out departure);

processedBooking = bFact.UpdateBooking(

processedBooking.GetBookingNb(),

pFact.UpdateCustomer(

processedBooking.GetCustomer(),

newName,

newAddress),

arrival,

departure);

if (decorationStack != null)

{

foreach (BookingDecorator reference in decorationStack)

{

reference.Setcomponent(processedBooking);

processedBooking = reference;

}

}

foreach (PersonComponent g in savedGuests)

{

processedBooking.AddGuest(g);

}

CurrentCust = processedBooking.GetCustomer();

dpFacade.Persist(processedBooking);

}

// reload current booking into the system to upload changes

if (IsABookingLoaded())

{

RestoreBooking(CurrentBook.GetBookingNb());

}

}

// METHODS RELATED TO CURRENT BOOKING'S GUESTS:

/\*

\* Adds a new person to current booking's list of guests.

\*/

public void AddGuest(String name, String passportNb, int age)

{

CurrentBook.AddGuest(pFact.GetNewGuest(name, passportNb, age));

}

/\*

\* Updates details of guest at given index in current booking's

\* list of guests.

\*/

public void EditGuest(int index,

String name,

String passportNb,

int age)

{

CurrentBook.GetGuests().RemoveAt(index);

CurrentBook.GetGuests().Insert(index,

pFact.GetNewGuest(name,

passportNb,

age));

}

/\*

\* True if the element at given index in list of guests is a

\* cutomer.

\*/

public bool IsGuestACustomer(int index)

{

if (index >= 0)

{

return CurrentBook.GetGuests().ElementAt(index).IsCustomer();

}

else

{

return false;

}

}

/\*

\* Adds current customer to current booking's list of guests.

\*/

public void AddCustomerToGuests(String passportNb, int age)

{

List<PersonComponent> savedGuests = CurrentBook.GetGuests();

DateTime arrival;

DateTime departure;

CurrentBook.GetDates(out arrival, out departure);

CurrentCust = pFact.GetNewGuest(CurrentCust,

passportNb,

age);

CurrentBook = bFact.UpdateBooking(CurrentBook.GetBookingNb(),

CurrentCust,

arrival,

departure);

foreach (PersonComponent g in savedGuests)

{

CurrentBook.GetGuests().Add(g);

}

CurrentBook.AddGuest(CurrentCust);

}

/\*

\* Updates guest details of current customer at given index in current

\* booking's list of guests.

\*/

public void EditCustomerGuestDetails(int index,

String passportNb,

int age)

{

CurrentBook.GetGuests().RemoveAt(index);

CurrentBook.GetGuests().Insert(index,

pFact.GetNewGuest(

CurrentCust.UndecorateOnce(),

passportNb,

age));

}

/\*

\* Deletes the guest at given index in list of guests for the

\* current booking.

\* Undecorates that guest if if it is also a

\* customer and updates CurrentCustomer with the correct

\* memory reference.

\*/

public void DeleteGuest(int index)

{

// First unwrap guest decorator from current customer if they are

// the guest being deleted:

if (CurrentBook.GetGuests().ElementAt(index).IsCustomer())

{

List<PersonComponent> savedGuests = CurrentBook.GetGuests();

DateTime arrival;

DateTime departure;

CurrentBook.GetDates(out arrival, out departure);

CurrentCust = CurrentCust.UndecorateOnce();

CurrentBook = bFact.UpdateBooking(CurrentBook.GetBookingNb(),

CurrentCust,

arrival,

departure);

foreach (PersonComponent g in savedGuests)

{

CurrentBook.GetGuests().Add(g);

}

}

// Then delete selected guest reference from guests list:

CurrentBook.GetGuests().RemoveAt(index);

}

// METHODS RELATED TO CURRENT BOOKING'S EXTRAS:

/\*

\* Decorates the current booking with a Breakfast extra.

\*/

public void AddBreakFast(String dietRequirements)

{

CurrentBook = bFact.AddBreakfast(CurrentBook, dietRequirements);

}

/\*

\* Decorates the current booking with an EveningMeal extra.

\*/

public void AddEveningMeal(String dietRequirements)

{

CurrentBook = bFact.AddEveningMeal(CurrentBook, dietRequirements);

}

/\*

\* Decorates the current booking with a CarHire extra.

\*/

public void AddCarHire(String driverName,

DateTime start,

DateTime end)

{

CurrentBook = bFact.AddCarHire(CurrentBook,

driverName,

start,

end);

}

/\*

\* Updates properties of a given Breakfast.

\*/

public void UpdateBreakfast(BookingDecorator reference,

String newDietRequirements)

{

CurrentBook = CurrentBook.Undecorate(reference);

CurrentBook = bFact.AddBreakfast(CurrentBook,

newDietRequirements);

}

/\*

\* Updates properties of a given EveningMeal.

\*/

public void UpdateEveningMeal(BookingDecorator reference,

String newDietRequirements)

{

CurrentBook = CurrentBook.Undecorate(reference);

CurrentBook = bFact.AddEveningMeal(CurrentBook,

newDietRequirements);

}

/\*

\* Updates properties of a given CarHire.

\*/

public void UpdateCarHire(BookingDecorator reference,

String newDriverName,

DateTime newStart,

DateTime newEnd)

{

CurrentBook = CurrentBook.Undecorate(reference);

CurrentBook = bFact.AddCarHire(CurrentBook,

newDriverName,

newStart,

newEnd);

}

/\*

\* Returns a list of references to each of the CurrentBooking's

\* decorators (= extras), or null if it is not decorated at all.

\*/

public List<BookingDecorator> GetCurrentExtras()

{

List<BookingDecorator> references;

CurrentBook.Unwrap(out references);

return references;

}

/\*

\* Returns a list of textual representations of each of the

\* CurrentBooking's decorators (= extra).

\*/

public List<String> GetCurrentExtrasNames()

{

List<BookingDecorator> references = GetCurrentExtras();

List<String> extras = new List<String>();

if (references != null)

{

foreach (BookingDecorator bd in references)

{

if (bd.GetType() == typeof(EveningMeal))

{

extras.Add("Evening meal");

}

else if (bd.GetType() == typeof(Breakfast))

{

extras.Add("Breakfast");

}

else if (bd.GetType() == typeof(CarHire))

{

extras.Add("CarHire");

}

}

}

return extras;

}

/\*

\* Returns the current booking's cost for, breakfasts or -1 if no

\* booking is currently loaded.

\*/

public float GetCurrentBreakfastCost()

{

float breakfastsCost = -1;

if (CurrentBook != null)

{

List<BookingDecorator> extras = GetCurrentExtras();

breakfastsCost = 0;

if (extras != null)

{

foreach (BookingDecorator e in extras)

{

if (e.GetType() == typeof(Breakfast))

{

breakfastsCost += e.GetExtraCost();

}

}

}

}

return breakfastsCost;

}

/\*

\* Returns the current booking's cost for, evening meals or -1 if no

\* booking is currently loaded.

\*/

public float GetCurrentEveningMealsCost()

{

float eveningMealsCost = -1;

if (CurrentBook != null)

{

List<BookingDecorator> extras = GetCurrentExtras();

eveningMealsCost = 0;

if (extras != null)

{

foreach (BookingDecorator e in extras)

{

if (e.GetType() == typeof(EveningMeal))

{

eveningMealsCost += e.GetExtraCost();

}

}

}

}

return eveningMealsCost;

}

/\*

\* Returns the current booking's cost for, evening meals or -1 if no

\* booking is currently loaded.

\*/

public float GetCurrentCarHireCost()

{

float carHiresCost = -1;

if (CurrentBook != null)

{

List<BookingDecorator> extras = GetCurrentExtras();

carHiresCost = 0;

if (extras != null)

{

foreach (BookingDecorator e in extras)

{

if (e.GetType() == typeof(CarHire))

{

carHiresCost += e.GetExtraCost();

}

}

}

}

return carHiresCost;

}

/\*

\* Removes the selected extra from the booking.

\*/

public void RemoveExtra(int index)

{

List<BookingDecorator> references = GetCurrentExtras();

if (references != null)

{

CurrentBook = CurrentBook.Undecorate(

references.ElementAt(index));

}

}

}

}

1. **SourceCode: MainWindow.xaml.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Navigation;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for MainWindow.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-09

\*/

public partial class MainWindow : Window

{

// PROPERTIES:

// reference to a ModelFacade instance:

private ModelFacade mFacade;

// METHODS:

/\*

\* Constructor.

\*/

public MainWindow()

{

this.mFacade = new ModelFacade();

InitializeComponent();

clearDisplay();

}

/\*

\* Loads and displays the booking referenced by txtBookingRef.Text.

\*/

private void btnLoadBooking\_Click(object sender, RoutedEventArgs e)

{

new WindowLoadBooking(mFacade).ShowDialog();

refreshDisplay();

}

/\*

\* Refreshes all fields displayed in the window according to

\* current system objects states.

\*/

private void refreshDisplay()

{

if (mFacade.IsABookingLoaded())

{

clearDisplay();

refreshBookingDisplay();

refreshCustomerDisplay();

refreshGuestsDisplay();

}

}

/\*

\* Refreshes the booking fields displayed in the window.

\*/

private void refreshBookingDisplay()

{

DateTime start;

DateTime end;

mFacade.GetCurrentBookDates(out start, out end);

// update labels content:

lblBookingNbValue.Content = mFacade.GetCurrentBookNb().ToString();

lblArrivalValue.Content = start.ToString().Substring(0, 10);

lblDepartureValue.Content = end.ToString().Substring(0, 10);

// make labels visible:

lblBooking.Visibility = Visibility.Visible;

lblBookingNb.Visibility = Visibility.Visible;

lblBookingNbValue.Visibility = Visibility.Visible;

lblArrival.Visibility = Visibility.Visible;

lblArrivalValue.Visibility = Visibility.Visible;

lblDeparture.Visibility = Visibility.Visible;

lblDepartureValue.Visibility = Visibility.Visible;

}

/\*

\* Refreshes the customer fields displayed in the window.

\*/

private void refreshCustomerDisplay()

{

// update labels content:

lblCustomerNameValue.Content = mFacade.GetCurrentCustName();

lblCustomerNbValue.Content = mFacade.GetCurrentCustNb().ToString();

// make labels visible:

lblCustomer.Visibility = Visibility.Visible;

lblCustomerNb.Visibility = Visibility.Visible;

lblCustomerNbValue.Visibility = Visibility.Visible;

lblCustomerName.Visibility = Visibility.Visible;

lblCustomerNameValue.Visibility = Visibility.Visible;

}

/\*

\* Refreshes the guests fields displayed in the window.

\*/

private void refreshGuestsDisplay()

{

BookingComponent b = mFacade.CurrentBook;

PersonComponent c = mFacade.CurrentCust;

// update listbox content:

foreach (String g in mFacade.GetGuestNames())

{

lstGuests.Items.Add(g);

}

// make label & list box visible:

lblGuests.Visibility = Visibility.Visible;

lstGuests.Visibility = Visibility.Visible;

}

/\*

\* Empties all boxes displayed in the MainWindow.

\*/

private void clearDisplay()

{

// hide booking data display:

lblBookingNbValue.Visibility = Visibility.Hidden;

lblArrivalValue.Visibility = Visibility.Hidden;

lblDepartureValue.Visibility = Visibility.Hidden;

// hide customer data display:

lblCustomerNbValue.Visibility = Visibility.Hidden;

lblCustomerNameValue.Visibility = Visibility.Hidden;

// hide guests data display:

lstGuests.Items.Clear();

}

/\*

\* Closes the current booking.

\*/

private void btnCloseBooking\_Click(object sender, RoutedEventArgs e)

{

mFacade.CurrentBookingClose();

clearDisplay();

}

/\*

\* Opens a WindowCreateEdit dialog to view & edit current booking

\* or create a new one.

\*/

private void btnNewEdit\_Click(object sender, RoutedEventArgs e)

{

new WindowCreateEdit(mFacade).ShowDialog();

refreshDisplay();

}

/\*

\* Opens a WindowInvoice dialog to view current booking invoice.

\*/

private void btnInvoice\_Click(object sender, RoutedEventArgs e)

{

if (!mFacade.IsABookingLoaded())

{

MessageBox.Show("There is no booking loaded in the system"

+ " yet.\r\n"

+ "Load a booking to view it's invoice.");

}

else

{

new WindowInvoice(mFacade).ShowDialog();

}

}

/\*

\* Saves the current system state when the program is closed.

\*/

private void Window\_Closing(object sender,

System.ComponentModel.CancelEventArgs e)

{

mFacade.PersistSystemState();

MessageBox.Show("Cheerio");

}

/\*

\* Deletes the booking curently loaded in the system.

\*/

private void btnDelete\_Click(object sender, RoutedEventArgs e)

{

int bookingNb = mFacade.GetCurrentBookNb();

mFacade.CurrentBookingClose();

mFacade.DeleteBooking(bookingNb);

clearDisplay();

}

}

}

1. **SourceCode: WindowLoadBooking.xaml.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for WindowLoadBooking.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-07

\*/

public partial class WindowLoadBooking : Window

{

// PROPERTIES:

// points to a ModelFacade instance.

private ModelFacade mFacade;

// METHODS:

/\*

\* Constructor.

\*/

public WindowLoadBooking(ModelFacade mFacade)

{

this.mFacade = mFacade;

InitializeComponent();

refreshDisplay();

}

/\*

\* Refreshes all fields displayed in the window according to

\* current system objects states.

\*/

private void refreshDisplay()

{

clearDisplay();

lstBookings.ItemsSource = mFacade.GetAllBookingNbs();

}

/\*

\* Refreshes all booking detail fields displayed in the window

\* according to current booking state.

\*/

private void refreshBookDetailDisplay()

{

BookingComponent b = mFacade.CurrentBook;

DateTime start;

DateTime end;

if (mFacade.IsABookingLoaded())

{

// update field contents:

b.GetDates(out start, out end);

lblArrivalValue.Content = start.ToString().Substring(0, 10);

lblDepartureValue.Content = end.ToString().Substring(0, 10);

lblCustNameValue.Content = b.GetCustomer().Name;

lstGuests.Items.Clear();

foreach (PersonComponent g in b.GetGuests())

{

lstGuests.Items.Add(g.Name);

}

// make labels visible:

lblArrivalValue.Visibility = Visibility.Visible;

lblDepartureValue.Visibility = Visibility.Visible;

lblCustNameValue.Visibility = Visibility.Visible;

}

else

{

refreshDisplay();

}

}

/\*

\* Empties all boxes displayed in the MainWindow.

\*/

private void clearDisplay()

{

clearBookingDetails();

lstBookings.ItemsSource = null;

lstGuests.Items.Clear();

}

/\*

\* Hide all booking detail fields from the window.

\*/

private void clearBookingDetails()

{

lblArrivalValue.Visibility = Visibility.Hidden;

lblCustNameValue.Visibility = Visibility.Hidden;

lblDepartureValue.Visibility = Visibility.Hidden;

lstGuests.Items.Clear();

}

/\*

\* loads selected booking into the system when double clicking on it.

\*/

private void lstBookings\_MouseDoubleClick(object sender,

MouseButtonEventArgs e)

{

List<int> l = (List<int>) lstBookings.ItemsSource;

int i = lstBookings.SelectedIndex;

if (i < 0 || !mFacade.RestoreBooking(l.ElementAt(i)))

{

MessageBox.Show("Please double click on a booking from the"

+ " list to load it into the system.");

}

refreshBookDetailDisplay();

}

}

}

1. **SourceCode: WindowCreateEdit.xaml.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for WindowCreateEdit.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-08

\*/

public partial class WindowCreateEdit : Window

{

//PROPERTIES:

// reference to calling window's ModelFacade instance:

private ModelFacade mFacade;

// METHODS:

/\*

\* The window constructor.

\*/

public WindowCreateEdit(ModelFacade modelFacade)

{

this.mFacade = modelFacade;

InitializeComponent();

lblBookingRef.Content = "Booking number\r\n";

if (mFacade.CurrentBook == null)

{

clearDisplay();

}

else

{

lblBookingRef.Content += mFacade.GetCurrentBookNb()

.ToString();

refreshDisplay();

}

}

/\*

\* Checks if the booking can be saved or updated on the basis of

\* window field values, and acts accordingly (closes the window,

\* except if the booking was a new one).

\*/

private void btnSave\_Click(object sender, RoutedEventArgs e)

{

if (areAllValuesValid())

{

if (!mFacade.IsABookingLoaded())

{

mFacade.CreateBooking((DateTime)dtpArrival.SelectedDate,

(DateTime)dtpDeparture.SelectedDate);

mFacade.PersistCurrentBooking();

refreshDisplay();

}

else

{

mFacade.UpdateBooking((DateTime)dtpArrival.SelectedDate,

(DateTime)dtpDeparture.SelectedDate);

mFacade.PersistCurrentBooking();

}

}

}

/\*

\* True if all the window fields are valid to create or amend a

\* booking, otherwise false.

\* Displays error message windows.

\*/

private bool areAllValuesValid()

{

bool areValidValues = true;

if (!mFacade.IsACustomerLoaded())

{

areValidValues = false;

MessageBox.Show("Please create or load a customer for"

+ " the booking before saving.");

}

if (dtpArrival.SelectedDate == null)

{

areValidValues = false;

MessageBox.Show("Please select a valid arrival date"

+ " before saving the booking.");

}

else if (dtpDeparture.SelectedDate == null)

{

areValidValues = false;

MessageBox.Show("Please select a valid departure date"

+ " before saving the booking.");

}

else if (dtpDeparture.SelectedDate <= dtpArrival.SelectedDate)

{

areValidValues = false;

MessageBox.Show("Departure date must be strictly"

+ " later than arrival date.");

}

return areValidValues;

}

/\*

\* Clears all fields displayed in the window.

\*/

private void clearDisplay()

{

lblBookingRef.Content = "Booking number:\r\n";

lblBookingRef.Visibility = Visibility.Hidden;

dtpArrival.SelectedDate = null;

dtpDeparture.SelectedDate = null;

lblCustNumberValue.Content = String.Empty;

lblCustNameValue.Content = String.Empty;

lblCustAddressValue.Content = String.Empty;

}

/\*

\* Refreshes all fields displayed in the window according to

\* current system objects states.

\*/

private void refreshDisplay()

{

clearDisplay();

refreshBookingDisplay();

refreshCustomerDisplay();

refreshGuestsDisplay();

refreshExtrasDisplay();

}

// METHODS RELATED TO CURRENT BOOKING:

/\*

\* Refreshes the booking fields displayed in the window.

\*/

private void refreshBookingDisplay()

{

if (mFacade.IsABookingLoaded())

{

DateTime arrival;

DateTime departure;

mFacade.GetCurrentBookDates(out arrival, out departure);

dtpArrival.SelectedDate = arrival;

dtpDeparture.SelectedDate = departure;

lblBookingRef.Content += mFacade.GetCurrentBookNb()

.ToString();

lblBookingRef.Visibility = Visibility.Visible;

}

}

// METHODS RELATED TO CURRENT CUSTOMER:

/\*

\* Refreshes the customer fields displayed in the window.

\*/

private void refreshCustomerDisplay()

{

if (mFacade.IsACustomerLoaded())

{

lblCustNumberValue.Content

= mFacade.GetCurrentCustNb().ToString();

lblCustNameValue.Content

= mFacade.GetCurrentCustName();

lblCustAddressValue.Content

= mFacade.GetCurrentCustAdress();

}

}

/\*

\* Loads & displays the customer referenced by txtCustNumber.Text

\*/

private void btnCreateLoadCust\_Click(object sender, RoutedEventArgs e)

{

new WindowCustomerDetails(mFacade).ShowDialog();

refreshCustomerDisplay();

}

// METHODS RELATED TO GUESTS:

/\*

\* Refreshes the guests fields displayed in the window.

\*/

private void refreshGuestsDisplay()

{

if (mFacade.IsABookingLoaded())

{

lblGuest.Visibility = Visibility.Visible;

lstGuests.Visibility = Visibility.Visible;

lstGuests.ItemsSource = mFacade.GetGuestNames();

}

}

/\*

\* Opens an empty WindowGuestDetail dialog to input new guest details

\* (if there is still less than 4 guests booked).

\*/

private void btnNewGuest\_Click(object sender, RoutedEventArgs e)

{

if (canAddGuest())

{

new WindowGuestDetails(mFacade, false).ShowDialog();

refreshDisplay();

}

}

/\*

\* True if it is possible to add a guest to the booking,

\* otherwise false.

\* Displays error message windows.

\*/

private bool canAddGuest()

{

bool canAddGuest = true;

if (!mFacade.IsABookingLoaded())

{

canAddGuest = false;

MessageBox.Show("Please save the booking before adding"

+ " the guests.");

}

else if (mFacade.GetCurrentNbGuests() >= 4)

{

canAddGuest = false;

MessageBox.Show("This booking is already full, the"

+ " maximum number of guests per booking"

+ " is 4.");

}

return canAddGuest;

}

/\*

\* Opens a WindowGuestDetails dialog to enter guest details for

\* current customer entity.

\*/

private void btnAddCustToGuests\_Click(object sender, RoutedEventArgs e)

{

if (canAddGuest())

{

if (mFacade.IsGuestACustomer(lstGuests.SelectedIndex))

{

MessageBox.Show("The customer is already booked as"

+ " a guest.");

}

else

{

new WindowGuestDetails(mFacade, true).ShowDialog();

refreshGuestsDisplay();

}

}

}

/\*

\* Opens a WindowGuestDetail to amend selected guest's details.

\*/

private void lstGuests\_MouseDoubleClick(object sender,

MouseButtonEventArgs e)

{

try

{

List<int> l = (List<int>)lstGuests.ItemsSource;

int i = lstGuests.SelectedIndex;

if (mFacade.GetCurrentNbGuests() == 0)

{

MessageBox.Show("There is currently no guests booked.");

}

else if (i < 0)

{

MessageBox.Show("Please double click on the guest that"

+ " you want to edit");

}

else if (mFacade.IsGuestACustomer(i))

{

new WindowGuestDetails(mFacade, true, i).ShowDialog();

refreshGuestsDisplay();

}

else

{

new WindowGuestDetails(mFacade, false, i).ShowDialog();

refreshGuestsDisplay();

}

}

catch

{

// do nothing

}

}

/\*

\* Deletes selected guest from current booking.

\*/

private void btnDeleteGuest\_Click(object sender, RoutedEventArgs e)

{

if (lstGuests.SelectedIndex < 0 || lstGuests.SelectedIndex > 3)

{

MessageBox.Show("Please first select the guest"

+ " that you want to delete.");

}

else

{

mFacade.DeleteGuest(lstGuests.SelectedIndex);

refreshGuestsDisplay();

}

}

// METHODS RELATED TO EXTRAS:

/\*

\* Refreshes the extras fields displayed in the window.

\*/

private void refreshExtrasDisplay()

{

if (mFacade.IsABookingLoaded())

{

lstExtras.Items.Clear();

foreach (String s in mFacade.GetCurrentExtrasNames())

{

lstExtras.Items.Add(s);

}

}

}

/\*

\* Opens a dialog to add a breakfasts extra to the current booking.

\*/

private void btnAddBreakfast\_Click(object sender, RoutedEventArgs e)

{

if (!mFacade.IsABookingLoaded())

{

MessageBox.Show("Please save your new booking before adding"

+ " a breakfast extra.");

}

else

{

new WindowBreakfastDetails(mFacade, null).ShowDialog();

refreshExtrasDisplay();

}

}

/\*

\* Opens a dialog to add an evening meals extra to the current booking.

\*/

private void btnAddEveningMeal\_Click(object sender, RoutedEventArgs e)

{

if (!mFacade.IsABookingLoaded())

{

MessageBox.Show("Please save your new booking before adding"

+ " an evening meals extra.");

}

else

{

new WindowEveningMealDetails(mFacade, null).ShowDialog();

refreshExtrasDisplay();

}

}

/\*

\* Opens a dialog to add a car hire extra to the current booking.

\*/

private void btnAddCarHire\_Click(object sender, RoutedEventArgs e)

{

if (!mFacade.IsABookingLoaded())

{

MessageBox.Show("Please save your new booking before adding"

+ " a car hire extra.");

}

else

{

new WindowCarHireDetails(mFacade, null).ShowDialog();

refreshExtrasDisplay();

}

}

/\*

\* Opens a Window{ExtraType}Details to amend selected extra.

\*/

private void lstExtras\_MouseDoubleClick(object sender,

MouseButtonEventArgs e)

{

List<BookingDecorator> extras = mFacade.GetCurrentExtras();

int i = lstExtras.SelectedIndex;

if (extras != null && extras.Count == 0)

{

MessageBox.Show("There is no extra for this booking"

+ " at present.");

}

else if (i < 0)

{

MessageBox.Show("Please double click on the extra that"

+ " you want to edit");

}

else

{

if (extras.ElementAt(i).GetType() == typeof(Breakfast))

{

new WindowBreakfastDetails(

mFacade, extras.ElementAt(i)).ShowDialog();

}

else if (extras.ElementAt(i).GetType() == typeof(EveningMeal))

{

new WindowEveningMealDetails(

mFacade, extras.ElementAt(i)).ShowDialog();

}

else if (extras.ElementAt(i).GetType() == typeof(CarHire))

{

new WindowCarHireDetails(

mFacade, extras.ElementAt(i)).ShowDialog();

}

refreshExtrasDisplay();

}

}

/\*

\* Deletes the selected extra from the currwent booking.

\*/

private void btnExtraDelete\_Click(object sender, RoutedEventArgs e)

{

if (lstExtras.SelectedIndex >= 0)

{

mFacade.RemoveExtra(lstExtras.SelectedIndex);

refreshExtrasDisplay();

}

else

{

MessageBox.Show("Please select the extra that you want to"

+ " delete from the booking");

}

}

}

}

1. **SourceCode: WindowCustomerDetails.xaml.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for WindowCustomerDetails.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-09

\*/

public partial class WindowCustomerDetails : Window

{

//PROPERTIES:

// reference to calling window's ModelFacade instance:

private ModelFacade mFacade;

// METHODS:

/\*

\* The window constructor.

\*/

public WindowCustomerDetails(ModelFacade modelFacade)

{

this.mFacade = modelFacade;

InitializeComponent();

refreshDisplay();

}

/\*

\* Refreshes all fields displayed in the window according to

\* current system objects states.

\*/

private void refreshDisplay()

{

clearDisplay();

lstCustomers.ItemsSource = mFacade.GetAllCustomerNbs();

if (mFacade.IsACustomerLoaded())

{

lblCustNumberValue.Content = mFacade.GetCurrentCustNb();

txtCustName.Text = mFacade.GetCurrentCustName();

txtCustAddress.Text = mFacade.GetCurrentCustAdress();

}

}

/\*

\* Refreshes all customer detail fields displayed in the window

\* according to currently loaded customer data.

\*/

private void refreshCustDetailDisplay()

{

if (mFacade.IsACustomerLoaded())

{

lblCustNumberValue.Content = mFacade.GetCurrentCustNb();

txtCustName.Text = mFacade.GetCurrentCustName();

txtCustAddress.Text = mFacade.GetCurrentCustAdress();

}

}

/\*

\* Empties all boxes displayed in the MainWindow.

\*/

private void clearDisplay()

{

clearCustomerDetails();

if (lstCustomers.Items != null)

{

lstCustomers.Items.Clear();

}

}

/\*

\* Hide empty all customer detail fields from the window.

\*/

private void clearCustomerDetails()

{

lblCustNumberValue.Content = String.Empty;

txtCustName.Text = String.Empty;

txtCustAddress.Text = String.Empty;

}

/\*

\* loads selected customer into the system when double clicking on it.

\*/

private void lstCustomers\_MouseDoubleClick(object sender,

MouseButtonEventArgs e)

{

List<int> l = (List<int>)lstCustomers.ItemsSource;

int i = lstCustomers.SelectedIndex;

if (i < 0 || !mFacade.RestoreCustomer(l.ElementAt(i)))

{

MessageBox.Show("Please double click on a customer from the"

+ " list to load it into the system, or create"

+ " a new one.");

}

refreshCustDetailDisplay();

}

/\*

\* Creates or updates customer, and closes dialog.

\*/

private void btnSave\_Click(object sender, RoutedEventArgs e)

{

if (areAllValuesValid())

{

if (mFacade.IsACustomerLoaded()) // update current customer

{

mFacade.UpdateCurrentCustomer(txtCustName.Text,

txtCustAddress.Text);

}

else // create a new customer

{

mFacade.CreateCustomer(txtCustName.Text,

txtCustAddress.Text);

}

this.Close();

}

}

/\*

\* True if all fields contain valid values to create/update a

\* customer.

\* Displays error messages.

\*/

private bool areAllValuesValid()

{

bool areAllValid = true;

if (String.IsNullOrWhiteSpace(txtCustName.Text))

{

areAllValid = false;

MessageBox.Show("Please enter a valid customer name");

}

else if (String.IsNullOrWhiteSpace(txtCustAddress.Text))

{

areAllValid = false;

MessageBox.Show("Please enter a valid customer address");

}

return areAllValid;

}

}

}

1. SourceCode: WindowGuestsDetails.xaml.cs

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for WindowGuestDetails.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-06

\*/

public partial class WindowGuestDetails : Window

{

// PROPERTIES:

// reference to calling window's ModelFacade instance:

private ModelFacade mFacade;

// true if the new guest to create is the booking's customer.

private bool isCustomer;

// index of current guest in current booking'list of guests.

private int guestIndex = -1;

/\*

\* Constructor 1: opens a window diplaying no value in any field.

\*/

public WindowGuestDetails(ModelFacade mFacade, bool isCustomer)

{

this.mFacade = mFacade;

this.isCustomer = isCustomer;

InitializeComponent();

if (isCustomer)

{

hideNameFields();

}

}

/\*

\* Constructor 2: opens a window diplaying the detail of element

\* at selected index in booking guests list.

\*/

public WindowGuestDetails(ModelFacade mFacade,

bool isCustomer,

int guestIndex)

{

this.mFacade = mFacade;

this.isCustomer = isCustomer;

this.guestIndex = guestIndex;

InitializeComponent();

txtName.Text = mFacade.CurrentBook

.GetGuests()

.ElementAt(guestIndex)

.Name;

txtPassportNb.Text = mFacade.CurrentBook

.GetGuests()

.ElementAt(guestIndex)

.GetPassportNb();

txtAge.Text = mFacade.CurrentBook

.GetGuests()

.ElementAt(guestIndex)

.GetAge()

.ToString();

if (isCustomer)

{

hideNameFields();

}

}

/\*

\* Hides window fields related to guest name.

\*/

private void hideNameFields()

{

lblName.Visibility = Visibility.Hidden;

txtName.Visibility = Visibility.Hidden;

}

/\*

\* Saves the new guest or guest detail changes.

\*/

private void btnSaveGuest\_Click(object sender, RoutedEventArgs e)

{

if (areAllValuesValid())

{

if (this.guestIndex >= 0)

{

updateGuest();

}

else

{

createGuest();

}

this.Close();

}

}

/\*

\* True if all the window fields are valid to create a guest,

\* otherwise false.

\* Displays error message windows.

\*/

private bool areAllValuesValid()

{

bool areValidValues = true;

int tmp;

if (!Int32.TryParse(txtAge.Text, out tmp))

{

MessageBox.Show("Please enter a valid number in age box.");

areValidValues = false;

}

else if (tmp <= 0)

{

MessageBox.Show("The guest's age must be strictly greater"

+ " than zero.");

areValidValues = false;

}

if (mFacade.CurrentCust == null

&& String.IsNullOrWhiteSpace(txtName.Text))

{

MessageBox.Show("Please fill in the guest's name");

areValidValues = false;

}

if (String.IsNullOrWhiteSpace(txtPassportNb.Text))

{

MessageBox.Show("Please fill in the guest's passport number");

areValidValues = false;

}

return areValidValues;

}

/\*

\* Updates guest details according to window TextBoxes contents.

\*/

private void updateGuest()

{

if (!this.isCustomer) // edit current guest

{

mFacade.EditGuest(guestIndex,

txtName.Text,

txtPassportNb.Text,

Int32.Parse(txtAge.Text));

}

else // edit current customer's guest properties

{

mFacade.EditCustomerGuestDetails(guestIndex,

txtPassportNb.Text,

Int32.Parse(txtAge.Text));

}

}

/\*

\* Creates new guest or decorates current customer according to window

\* TextBoxes contents.

\*/

private void createGuest()

{

if (!this.isCustomer) // create and add new guest

{

mFacade.AddGuest(txtName.Text,

txtPassportNb.Text,

Int32.Parse(txtAge.Text));

}

else // decorate current customer as guest and add to list

{

mFacade.AddCustomerToGuests(txtPassportNb.Text,

Int32.Parse(txtAge.Text));

}

}

}

}

1. **SourceCode: WindowBreakfastDetails.xaml.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for WindowBreakfastDetails.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-07

\*/

public partial class WindowBreakfastDetails : Window

{

//PROPERTIES:

// reference to calling window's ModelFacade instance:

private ModelFacade mFacade;

// points to the Breakfast edited (is null when creating new one).

private BookingDecorator breakfast;

// METHODS:

/\*

\* Constructor, the index passed must be the index in the current

\* booking's decoration stack as returned by

\* ModelFacade.GetCurrentExtras()) or -1 for a new extra.

\*/

public WindowBreakfastDetails(ModelFacade mFacade,

BookingDecorator instance)

{

this.mFacade = mFacade;

this.breakfast = instance;

InitializeComponent();

if (this.breakfast != null)

{

txtDietRequirements.Text

= ((Breakfast)instance).GetDietRequirements();

}

else

{

txtDietRequirements.Text = String.Empty;

}

}

/\*

\* Creates or updates the extra.

\*/

private void btnSave\_Click(object sender, RoutedEventArgs e)

{

if (this.breakfast != null)

{

mFacade.UpdateBreakfast(this.breakfast,

txtDietRequirements.Text);

}

else

{

mFacade.AddBreakFast(txtDietRequirements.Text);

}

this.Close();

}

}

}

1. **SourceCode: WindowEveningMealDetails.xaml.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for WindowEveningMealDetails.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-08

\*/

public partial class WindowEveningMealDetails : Window

{

//PROPERTIES:

// reference to calling window's ModelFacade instance:

private ModelFacade mFacade;

// points to the EveningMeal edited (is null when creating new one).

private BookingDecorator eveningMeal;

// METHODS:

/\*

\* Constructor, the index passed must be the index in the current

\* booking's decoration stack index as returned by

\* ModelFacade.GetCurrentExtras()) or -1 for a new extra.

\*/

public WindowEveningMealDetails(ModelFacade mFacade,

BookingDecorator instance)

{

this.mFacade = mFacade;

this.eveningMeal = instance;

InitializeComponent();

if (this.eveningMeal != null)

{

txtDietRequirements.Text

= ((EveningMeal)instance).GetDietRequirements();

}

else

{

txtDietRequirements.Text = String.Empty;

}

}

/\*

\* Creates or updates the extra.

\*/

private void btnSave\_Click(object sender, RoutedEventArgs e)

{

if (this.eveningMeal != null)

{

mFacade.UpdateEveningMeal(this.eveningMeal,

txtDietRequirements.Text);

}

else

{

mFacade.AddEveningMeal(txtDietRequirements.Text);

}

this.Close();

}

}

}

1. **SourceCode: WindowCarHireDetails.xaml.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for WindowCarHireDetails.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-08

\*/

public partial class WindowCarHireDetails : Window

{

//PROPERTIES:

// reference to calling window's ModelFacade instance:

private ModelFacade mFacade;

// points to the CarHire extra edited (is null when creating new one).

private BookingDecorator carHire;

// METHODS:

/\*

\* Constructor, the index passed must be the index in the current

\* booking's decoration stack index as returned by

\* ModelFacade.GetCurrentExtras()) or -1 for a new extra.

\*/

public WindowCarHireDetails(ModelFacade mFacade,

BookingDecorator instance)

{

this.mFacade = mFacade;

this.carHire = instance;

InitializeComponent();

if (this.carHire != null)

{

DateTime start;

DateTime end;

((CarHire)instance).GetHireDates(out start, out end);

dtpStart.SelectedDate = start;

dtpEnd.SelectedDate = end;

txtDriverName.Text = ((CarHire)instance).GetDriverName();

}

else

{

txtDriverName.Text = String.Empty;

}

}

/\*

\* Creates or updates the extra.

\*/

private void btnSave\_Click(object sender, RoutedEventArgs e)

{

if (areAllValuesValid())

{

if (this.carHire != null)

{

mFacade.UpdateCarHire(this.carHire,

txtDriverName.Text,

(DateTime)dtpStart.SelectedDate,

(DateTime)dtpEnd.SelectedDate);

}

else

{

mFacade.AddCarHire(txtDriverName.Text,

(DateTime)dtpStart.SelectedDate,

(DateTime)dtpEnd.SelectedDate);

}

this.Close();

}

}

/\*

\* True if all the window fields are valid to create a car hire extra,

\* otherwise false.

\* Displays error message windows.

\*/

private bool areAllValuesValid()

{

bool areValidValues = true;

DateTime arrival;

DateTime departure;

mFacade.GetCurrentBookDates(out arrival, out departure);

if (String.IsNullOrWhiteSpace(txtDriverName.Text))

{

areValidValues = false;

MessageBox.Show("Please enter a driver name for the"

+ "car hire.");

}

else if (dtpStart.SelectedDate == null)

{

areValidValues = false;

MessageBox.Show("Please select a start date for the"

+ " car hire.");

}

else if (dtpStart.SelectedDate < arrival

|| dtpStart.SelectedDate >= departure)

{

areValidValues = false;

MessageBox.Show("The selected start date is outwith "

+ " the booking dates.\r\n"

+ "Please select a start date between"

+ " booking arrival and departure dates.");

}

else if (dtpEnd.SelectedDate == null)

{

areValidValues = false;

MessageBox.Show("Please select an end date for the"

+ " car hire.");

}

else if (dtpEnd.SelectedDate <= arrival

|| dtpEnd.SelectedDate > departure)

{

areValidValues = false;

MessageBox.Show("The selected end date is outwith "

+ " the booking dates.\r\n"

+ "Please select a start date between"

+ " booking arrival and departure dates.");

}

return areValidValues;

}

}

}

1. **SourceCode: WindowInvoice.xaml.cs**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

using System.Windows;

using System.Windows.Controls;

using System.Windows.Data;

using System.Windows.Documents;

using System.Windows.Input;

using System.Windows.Media;

using System.Windows.Media.Imaging;

using System.Windows.Shapes;

namespace Program

{

/\*

\* Interaction logic for MainWindow.xaml

\*

\* author: Pierre Ruiz (matriculation number 08009004)

\* last modified: 2016-12-07

\*/

public partial class WindowInvoice : Window

{

// PROPERTIES:

// reference to a ModelFacade instance:

private ModelFacade mFacade;

// METHODS:

/\*

\* Constructor.

\*/

public WindowInvoice(ModelFacade mFacade)

{

InitializeComponent();

this.mFacade = mFacade;

// get all the amounts:

int nbNights = mFacade.GetCurrentNbNights();

float costPerNight = mFacade.GetCurrentCostPerNight();

float breakfastCost = mFacade.GetCurrentBreakfastCost();

float eveningMealsCost = mFacade.GetCurrentEveningMealsCost();

float carHireCost = mFacade.GetCurrentCarHireCost();

printDetails();

printBookingBreakdown(nbNights, costPerNight);

printExtrasBreakdown(breakfastCost, eveningMealsCost, carHireCost);

printTotal((nbNights \* costPerNight)

+ breakfastCost

+ eveningMealsCost

+ carHireCost);

}

/\*

\* Fills the labels of the invoice concerning the booking

\* details.

\*/

private void printDetails()

{

lblBookingNb.Content

+= " " + mFacade.GetCurrentBookNb().ToString();

lblCustomerNb.Content

+= " " + mFacade.GetCurrentCustNb().ToString();

lblCustomerDetails.Content

+= " " + mFacade.GetCurrentCustName();

lblAddress.Content

= mFacade.GetCurrentCustAdress();

}

/\*

\* Fills the labels of the invoice concerning the booking

\* cost.

\*/

private void printBookingBreakdown(int nbNights, float costPerNight)

{

lblNbNightsValue.Content = nbNights;

lblCostPerNightValue.Content = costPerNight;

lblSubtotalValue.Content = (costPerNight \* nbNights);

}

/\*

\* Fills the labels of the invoice concerning the extras

\* costs.

\*/

private void printExtrasBreakdown(float breakfastCost,

float eveningMealsCost,

float carHireCost)

{

lblBreakfastCostValue.Content = breakfastCost;

lblEveningMealsCostValue.Content = eveningMealsCost;

lblCarHireCostValue.Content = carHireCost;

lblExtrasTotalValue.Content = (breakfastCost

+ eveningMealsCost

+ carHireCost);

}

/\*

\* Fills the labels of the invoice concerning the booking

\* total due.

\*/

private void printTotal(float grandTotal)

{

lblTotalDueValue.Content = grandTotal;

}

}

}

1. **Source code: UnitTest1.cs**

using System;

using Microsoft.VisualStudio.TestTools.UnitTesting;

namespace Program

{

[TestClass]

public class UnitTest1

{

[TestMethod]

public void TestBookingConstrutor\_NormalCase()

{

// arrange

PersonComponent c = PersonFactory.Instance

.GetNewCustomer("name","address");

BookingComponent b1 = new Booking(1,

c,

new DateTime(2016, 12, 09),

new DateTime(2016, 12, 13));

BookingComponent b2 = new Booking(1,

c,

new DateTime(2016, 12, 09),

new DateTime(2016, 12, 13));

// assert

Assert.IsTrue(b1.Equals(b2), "Booking.Equals method problem");

}

[TestMethod]

[ExpectedException(typeof(ArgumentException))]

public void TestBookingConstructor\_CustomerException()

{

// arrange

PersonComponent p = new Person("name");

// act

BookingComponent b = new Booking(98,

p,

new DateTime(2016, 02, 18),

new DateTime(2016, 03, 2));

}

[TestMethod]

[ExpectedException(typeof(ArgumentException))]

public void TestBookingConstructor\_BookingNbException()

{

// arrange

PersonComponent c = PersonFactory.Instance

.GetNewCustomer("name", "address");

// act

BookingComponent b = new Booking(-10,

c,

new DateTime(1998, 02, 18),

new DateTime(1998, 03, 2));

}

[TestMethod]

[ExpectedException(typeof(ArgumentException))]

public void TestBookingConstructor\_DatesException()

{

// arrange

PersonComponent c = PersonFactory.Instance

.GetNewCustomer("name", "address");

// act

BookingComponent b = new Booking(3,

c,

new DateTime(2016, 04, 18),

new DateTime(2016, 02, 15));

}

[TestMethod]

public void TestBookingAddGuest\_NormalCase()

{

// arrange

PersonComponent expected = PersonFactory.Instance

.GetNewGuest("myself",

"08855N8",

31);

BookingComponent b1 = new Booking(

1,

PersonFactory.Instance

.GetNewCustomer("name",

"address"),

new DateTime(1024, 12, 09),

new DateTime(2016, 9, 3));

// act

b1.AddGuest(expected);

// assert

Assert.IsTrue(b1.GetGuests().Contains(expected),

"Problem with Booking.AddGuest");

}

[TestMethod]

public void TestBookingGetNbGuests\_NormalCase()

{

// arrange

int expected = 0;

BookingComponent b1 = new Booking(

1,

PersonFactory.Instance

.GetNewCustomer("name",

"address"),

new DateTime(1024, 12, 09),

new DateTime(2016, 9, 3));

// act

int result = b1.GetNbGuests();

// assert

Assert.AreEqual(expected, result,

"Problem with Booking.GetNbGuests");

}

[TestMethod]

public void TestBookingGetNbNights\_NormalCase()

{

// arrange

int expected = 4;

BookingComponent b1 = new Booking(

1,

PersonFactory.Instance

.GetNewCustomer("name",

"address"),

new DateTime(2010, 01, 07),

new DateTime(2010, 01, 11));

// act

int result = b1.GetNbNights();

// assert

Assert.AreEqual(expected, result,

"Problem with Booking.GetNbNights");

}

[TestMethod]

public void TestBookingGetCostPerNight\_NormalCase()

{

// arrange

float expected = 80;

BookingComponent b1 = new Booking(

1,

PersonFactory.Instance

.GetNewCustomer("name",

"address"),

new DateTime(2010, 01, 07),

new DateTime(2010, 01, 11));

b1.AddGuest(PersonFactory.Instance.GetNewGuest("g1", "Pass", 57));

b1.AddGuest(PersonFactory.Instance.GetNewGuest("g2", "Port", 14));

// act

float result = b1.GetCostPerNight();

// assert

Assert.AreEqual(expected, result,

"Problem with Booking.GetCostPerNight");

}

}

}