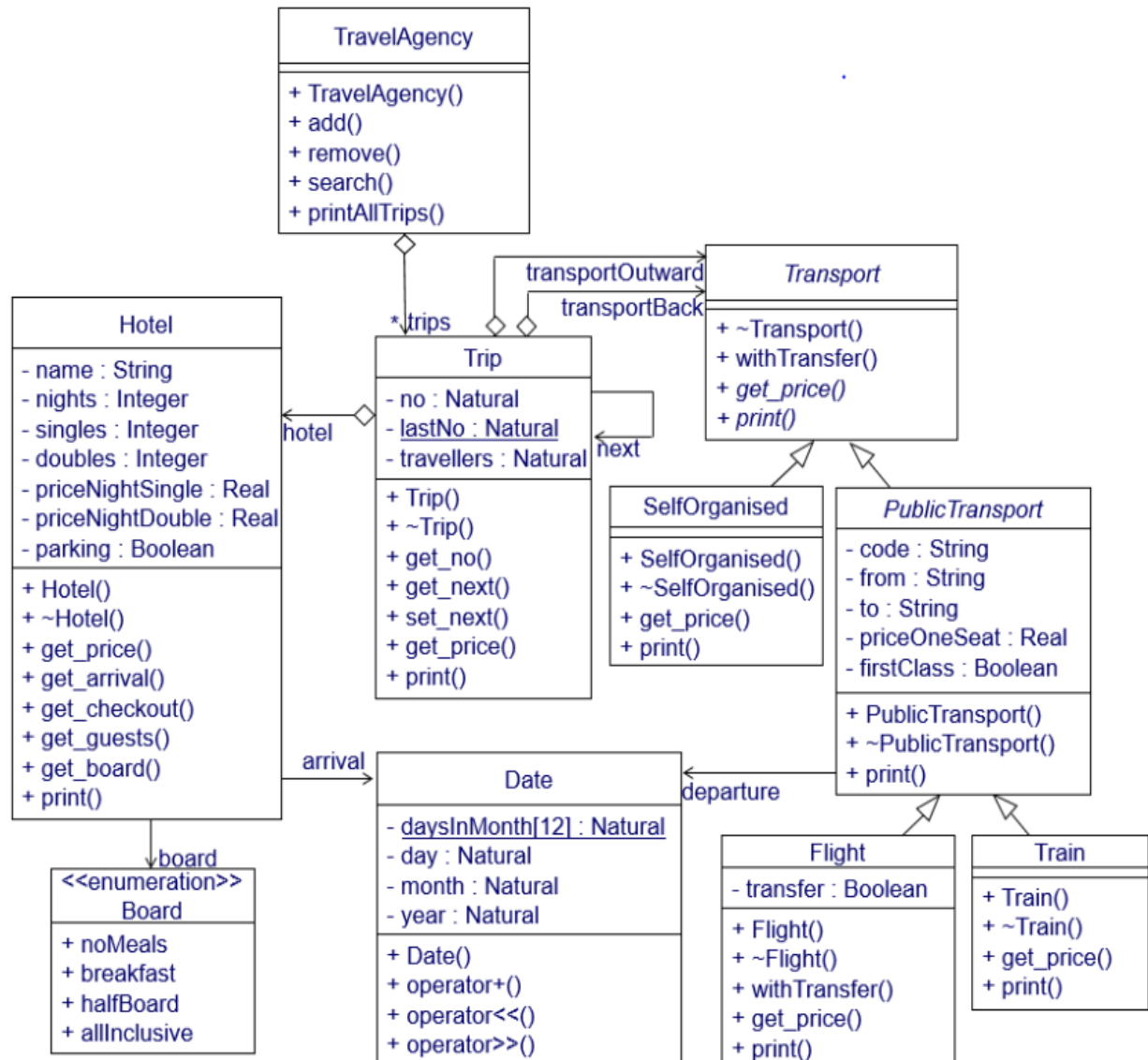


Hotline Travel Agency

For a **Travel Agency** a simplified management of enquiries of **Trips** shall get programmed including a **Hotel** and the **Transport** for the outward journey and the journey back by **Flight** or **Train** or **Self Organised**. The following UML diagram shows the to implement classes:



Task Class Date:

Define a class with name **Date** to store a date with three private short unsigned integer attributes **day**, **month** and **year**, a public overloaded constructor to initialise a date, a public overloaded binary member operator `+` with a number `n` of days as parameter returning a new date `n` days later (after December, 31st, the next day is January, 1st, of the following year), as well as an overloaded friend input and output operator.

Hints: to simplify it the value of `n` shall have a value of maximum 28 days (4 weeks). For the

implementation of operator + a constant array **daysInMonth** as class variable may be helpful storing the number of days in each month; leap years shall be ignored.

Task Class Board:

Define a C++ enumeration (enum struct) with values for no meals, breakfast, half pension and all-inclusive as well as a related overloaded binary output operator.

Task Class Hotel:

Define a class with name **Hotel** with following members:

a private C++ string attribute for the **name** of the hotel.

three private integer attributes **nights** for the number of booked nights, **singles** for the number of booked single rooms and **doubles** for the number of booked double rooms.

a private attribute of type **Board** for the booked **board**.

two private real-valued attributes **priceNightSingle** for the price of a single room for one night and **priceNightDouble** for the price of a double room one night.

a private Boolean attribute with name **parking** for an additionally booked parking place.

a public overloaded standard constructor where all values of the attributes shall be inputted like in the examples below to initialise them appropriately (maximum 28 nights/4 weeks shall be possible to book).

a public destructor outputting a message like shown in the examples below.

a public method with name **get_price** without parameter returning the total price calculated by the number of nights multiplied with the booked single and double rooms plus 10 EUR for each night in case of a booked parking place.

a public method with name **get_arrival** without parameter returning the arrival date.

a public method with name **get_checkout** without parameter returning the departure date (arrival date plus number of nights).

a public method with name **get_guests** without parameter returning the number of sleeping guests, e.g. 1 for a booked single room, 4 for two double rooms or 9 for three single and three double rooms booked.

a public method with name **print** without parameter writing the arrival date, the name of the hotel, the number of booked nights, the number of booked single and double rooms, the booked board as well as whether a parking place is booked (see examples below).

Task Class Transport:

Define an abstract class with name **Transport** with following members:

a public virtual destructor writing a respective output message.

a public abstract/pure virtual member function with name **withTransfer** without parameter and a Boolean return value.

a public abstract/pure virtual member function with name **get_price** without parameter and a real-valued return value.

a public abstract/pure virtual member function with name **print** without parameter or return value.

Task Class Selforganised:

For self organised transport outwards or back define a class with name **SelfOrganised** inheriting public from class **Transport** with following members:

a public standard constructor.

a public virtual destructor writing a respective output.

a public virtual member function with name **withTransfer** without parameter always returning **false**.

a public virtual member function with name **get_price** without parameter always returning **0.00** EUR.

a public virtual method with name **print** without parameter or return value writing "**self organised transport**" (see example below).

Task Class Publictransport:

Define an abstract class with name **PublicTransport** inheriting public from class **Transport** with following members:

a private attribute of type **Date** for the **departure**.

a private C++ **string** attribute with name **code** for the flight, train, ...

a private C++ **string** attribute with name **from** for the place of departure.

a private C++ **string** attribute with name **to** for the place of arrival.

a private real-valued attribute with name **priceOneSeat** for the price of one seat.

a private Boolean attribute with name **firstClass** whether the seats are first class.

a public constructor with a date as parameter for the departure day, three C++ **string** parameters to initialise the code, the places of departure and arrival, a parameter for the price of one seat as well as a Boolean default parameter with value **false** whether first class is wanted.

a public virtual destructor writing a respective output message including the code and date of departure (see examples below).

a public virtual method with name **print** without parameter or return value writing the date, the code, the places of departure and of arrival and "**(first class)**" in case of wanted (see example below).

Task Class Flight:

Define a class with name **Flight** inheriting public from class **PublicTransport** with following members:

a private Boolean attribute with name **transfer** whether also a transfer is offered.

a public constructor with a date as parameter for the departure day, three C++ **string** parameters to initialise the code of the flight, the airports of departure and arrival, a parameter for the price of one seat, a Boolean default parameter with value **false** whether the seat shall be first class as well as a Boolean default parameter with value **true** whether a transfer is included.

a public virtual destructor writing a respective output message.

a public virtual method with name **withTransfer** without parameter returning the value of the respective attribute.

a public virtual method with name **get_price** without parameter returning the value of attribute **priceOneSeat** for an economy seat and its doubled value for a first class seat.

a public virtual method with name **print** without parameter or return value writing "**flight** " and afterwards calling the same name method of the direct upper class (see example below).

Task Class Train:

Define a class with name **Train** inheriting public from class **PublicTransport** with following members:

a public constructor with a date as parameter for the departure day, three C++ **string** parameters to initialise the code of the train, the train stations of departure and arrival, a parameter for the price of one seat and a Boolean default parameter with value **false** whether the seat shall be first class.

a public virtual destructor writing a respective output message.

a public virtual member function with name **withTransfer** without parameter always returning **false**.

a public virtual method with name **get_price** without parameter returning the value of attribute **priceOneSeat** for a seat in second class and its 1.5 fold value for a first class seat.

a public virtual method with name **print** without parameter or return value writing "**train** " and afterwards calling the same name method of the direct upper class (see example below).

Task Class Trip:

Define a class for a holiday **Trip** planned with following members:

a private constant unsigned integer attribute **no** for a travel agency internal consecutively given unique number for each object.

a private static unsigned integer class variable with name **lastNo** to initialise sequential numbers **no** for each holiday trip, which shall get incremented each time a new object of this class is generated and is used to automatically get unique identifying numbers for all trips.

This class variable shall be initialised - outside of the class - with value 0.

a private unsigned integer attribute **travellers** for the number of persons of this holiday trip.

a private pointer attribute **hotel** to the **Hotel** of this holiday trip.

a private pointer attribute **transportOutward** to the outward journey of this holiday trip.

a private pointer attribute **transportBack** to the journey back of this holiday trip.

a private pointer attribute **next** to generate a list of holiday trips.

a public constructor with a number of travellers, pointers to a hotel, transport outward and back as well as a default parameter pointer with value null pointer to a next trip in the list as in total five parameters to initialise all attributes - the number of the trip and the increment of the class attribute needs to be regarded also.

a public virtual destructor deleting also the hotel, the outward transport and back as well as writing a respective output message.

a public method with name **get_no** without parameter returning the number of the trip.

a public method with name **get_next** without parameter returning a pointer to the next trip within the list.

a public method with name **set_next** and a pointer to a trip as parameter assigning it as next trip within the list.

a public method with name **get_price** without parameter returning the calculated price of the complete trip for all travellers added by the price of the hotel, the outward journey and journey back.

a public method with name **print** without parameter or return value writing the number of the trip, the number of travellers, the hotel, the outward journey and journey back, whether with or without transfer and the overall price (see example below).

Task Class TravelAgency:

Define a class with name **TravelAgency** with following members:

a private pointer attribute **trips** as head of a list of holiday trips.

a public standard constructor initialising the head of the list with a null pointer.

a public method with name **add** with a pointer to a trip as parameter inserting it as head of the list.

a public method with name **remove** with a pointer to a trip as parameter deleting this trip from the list.

a public method with name **search** with a number as parameter searching for the trip with this number and returning a pointer to it or otherwise a null pointer.

a public method with name **printAllTrips** without parameter or return value outputting all trips within the list (see example below).

Task Main:

The hotline for the travel agency is in start phase, therefore only a simple functionality shall be offered. Define in **main** an object of class **TravelAgency** and further objects and variables, and program a small menu with three functionalities (0 for end):

1. for a new trip the hotel by the standard constructor, the outward journey and journey back data within this menu entry shall be inputted as shown in examples below and the new trip added to the list.
2. after inputting a number search for a trip with this number, print it (if found) and optionally delete it from the list.
3. print all trips within the list.

Example Program Run:

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 1

name of hotel: Adlon

arrival on: 30.12.2018

how many nights: 3

how many single bed rooms: 1

how many double bed rooms: 1

a all inclusive

b breakfast

h half board

w without meals

h

price one night in single bed room: 100

price one night in double bed room: 150

with parking (y(es) or n(o)): n

please choose transport for outward journey

0 self organised

1 by flight

2 by train

your choice: 2

code of train: ICE 123

main train station of departure: Duisburg Hbf

main train station of arrival: Berlin Hbf

price for one passenger: 15

please choose transport for journey back

0 self organised

1 by flight

2 by train

your choice: 2

code of train: ICE 123

main train station of departure: Duisburg Hbf

main train station of arrival: Berlin Hbf

price for one passenger: 15

please choose transport for journey back

0 self organised

1 by flight

2 by train

your choice: 2

code of train: ICE 321

main train station of departure: Berlin Hbf

main train station of arrival: Duisburg Hbf

price for one passenger: 17

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 3

trip inquiry 1 for 3 person(s)

check-in: hotel 30.12.2018 Adlon for 3 night(s) 1 double bed room(s) 1 single bed room(s)
half board

outward journey: train 30.12.2018 ICE 123 from Duisburg Hbf to Berlin Hbf

journey back: train 02.01.2019 ICE 321 from Berlin Hbf to Duisburg Hbf

no transfer

price: 846.00 EUR

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 1

name of hotel: Bavaria

arrival on: 25.09.2019

how many nights: 1

how many single bed rooms: 0

how many double bed rooms: 1

a all inclusive

b breakfast

h half board

w without meals

b

price one night in single bed room: 50

price one night in double bed room: 80

with parking (y(es) or n(o)): y

please choose transport for outward journey

0 self organised

1 by flight

2 by train

your choice: 0

please choose transport for journey back

0 self organised

1 by flight

2 by train

your choice: 0

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 3

trip inquiry 2 for 2 person(s)

check-in: hotel 25.09.2019 Bavaria for 1 night(s) 1 double bed room(s)
with breakfast, parking included

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 90.00 EUR

trip inquiry 1 for 3 person(s)

check-in: hotel 30.12.2018 Adlon for 3 night(s) 1 double bed room(s) 1 single bed room(s)
half board

outward journey: train 30.12.2018 ICE 123 from Duisburg Hbf to Berlin Hbf

journey back: train 02.01.2019 ICE 321 from Berlin Hbf to Duisburg Hbf

no transfer

price: 846.00 EUR

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 1

name of hotel: RIU

arrival on: 25.05.2019

how many nights: 10

how many single bed rooms: 5

how many double bed rooms: 5

a all inclusive

b breakfast

h half board

w without meals

a

price one night in single bed room: 50

price one night in double bed room: 80

with parking (y(es) or n(o)): n

please choose transport for outward journey

0 self organised

1 by flight

2 by train

your choice: 1

code of flight: KLM 1234

airport of departure: Amsterdam

airport of arrival: Palma

price for one passenger: 29

please choose transport for journey back

0 self organised

1 by flight

2 by train

your choice: 1

code of flight: KLM 4567

airport of departure: Palma

airport of arrival: Duesseldorf

price for one passenger: 39

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 3

trip inquiry 3 for 15 person(s)

check-in: hotel 25.05.2019 RIU for 10 night(s) 5 double bed room(s) 5 single bed room(s)
all inclusive

outward journey: flight 25.05.2019 KLM 1234 from Amsterdam to Palma

journey back: flight 04.06.2019 KLM 4567 from Duesseldorf to Palma

transfer included

price: 7520.00 EUR

trip inquiry 2 for 2 person(s)

check-in: hotel 25.09.2019 Bavaria for 1 night(s) 1 double bed room(s)
with breakfast, parking included

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 90.00 EUR

trip inquiry 1 for 3 person(s)

check-in: hotel 30.12.2018 Adlon for 3 night(s) 1 double bed room(s) 1 single bed room(s)
half board

outward journey: train 30.12.2018 ICE 123 from Duisburg Hbf to Berlin Hbf

journey back: train 02.01.2019 ICE 321 from Berlin Hbf to Duisburg Hbf

no transfer

price: 846.00 EUR

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 2

number of trip: 1

trip inquiry 1 for 3 person(s)

check-in: hotel 30.12.2018 Adlon for 3 night(s) 1 double bed room(s) 1 single bed room(s)
half board

outward journey: train 30.12.2018 ICE 123 from Duisburg Hbf to Berlin Hbf

journey back: train 02.01.2019 ICE 321 from Berlin Hbf to Duisburg Hbf

no transfer

price: 846.00 EUR

(d)delete or 🗑️ ot: d

destructor hotel Adlon at 30.12.2018 for 3 guests done

destructor Train done

destructor PublicTransport ICE 123 at 30.12.2018 done

destructor Transport done

destructor Train done

destructor PublicTransport ICE 321 at 02.01.2019 done

destructor Transport done

destructor Trip done

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 3

trip inquiry 3 for 15 person(s)

check-in: hotel 25.05.2019 RIU for 10 night(s) 5 double bed room(s) 5 single bed room(s)
all inclusive

outward journey: flight 25.05.2019 KLM 1234 from Amsterdam to Palma

journey back: flight 04.06.2019 KLM 4567 from Duesseldorf to Palma

transfer included

price: 7520.00 EUR

trip inquiry 2 for 2 person(s)

check-in: hotel 25.09.2019 Bavaria for 1 night(s) 1 double bed room(s)
with breakfast, parking included

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 90.00 EUR

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 2

number of trip: 3

trip inquiry 3 for 15 person(s)

check-in: hotel 25.05.2019 RIU for 10 night(s) 5 double bed room(s) 5 single bed room(s)
all inclusive

outward journey: flight 25.05.2019 KLM 1234 from Amsterdam to Palma

journey back: flight 04.06.2019 KLM 4567 from Duesseldorf to Palma

transfer included

price: 7520.00 EUR

(d)delete or 🗑️ ot: n

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 3

trip inquiry 3 for 15 person(s)

check-in: hotel 25.05.2019 RIU for 10 night(s) 5 double bed room(s) 5 single bed room(s)
all inclusive

outward journey: flight 25.05.2019 KLM 1234 from Amsterdam to Palma

journey back: flight 04.06.2019 KLM 4567 from Duesseldorf to Palma

transfer included

price: 7520.00 EUR

trip inquiry 2 for 2 person(s)

check-in: hotel 25.09.2019 Bavaria for 1 night(s) 1 double bed room(s)
with breakfast, parking included

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 90.00 EUR

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 1

name of hotel: Atlantic

arrival on: 28.2.2019

how many nights: 1

how many single bed rooms: 1

how many double bed rooms: 0

a all inclusive

b breakfast

h half board

w without meals

w

price one night in single bed room: 100

price one night in double bed room: 200

with parking (y(es) or n(o)): n

please choose transport for outward journey

0 self organised

1 by flight

2 by train

your choice: 0

please choose transport for journey back

0 self organised

1 by flight

2 by train

your choice: 0

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 3

trip inquiry 4 for 1 person(s)

check-in: hotel 28.02.2019 Atlantic for 1 night(s) 1 single bed room(s)
without meals

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 100.00 EUR

trip inquiry 3 for 15 person(s)

check-in: hotel 25.05.2019 RIU for 10 night(s) 5 double bed room(s) 5 single bed room(s)
all inclusive

outward journey: flight 25.05.2019 KLM 1234 from Amsterdam to Palma

journey back: flight 04.06.2019 KLM 4567 from Duesseldorf to Palma

transfer included

price: 7520.00 EUR

trip inquiry 2 for 2 person(s)

check-in: hotel 25.09.2019 Bavaria for 1 night(s) 1 double bed room(s)
with breakfast, parking included

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 90.00 EUR

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 2

number of trip: 1

trip not found

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 2

number of trip: 3

trip inquiry 3 for 15 person(s)

check-in: hotel 25.05.2019 RIU for 10 night(s) 5 double bed room(s) 5 single bed room(s)
all inclusive

outward journey: flight 25.05.2019 KLM 1234 from Amsterdam to Palma

journey back: flight 04.06.2019 KLM 4567 from Duesseldorf to Palma

transfer included

price: 7520.00 EUR

(d)delete or 🍌 ot: d

destructor hotel RIU at 25.05.2019 for 15 guests done

destructor Flight done

destructor PublicTransport KLM 1234 at 25.05.2019 done

destructor Transport done

destructor Flight done

destructor PublicTransport KLM 4567 at 04.06.2019 done

destructor Transport done

destructor Trip done

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 3

trip inquiry 4 for 1 person(s)

check-in: hotel 28.02.2019 Atlantic for 1 night(s) 1 single bed room(s)
without meals

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 100.00 EUR

trip inquiry 2 for 2 person(s)

check-in: hotel 25.09.2019 Bavaria for 1 night(s) 1 double bed room(s)
with breakfast, parking included

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 90.00 EUR

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 2

number of trip: 4

trip inquiry 4 for 1 person(s)

check-in: hotel 28.02.2019 Atlantic for 1 night(s) 1 single bed room(s)
without meals

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 100.00 EUR

(d)delete or 🍌 ot: d

destructor hotel Atlantic at 28.02.2019 for 1 guests done

destructor SelfOrganised done

destructor Transport done

destructor SelfOrganised done

destructor Transport done

destructor Trip done

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: 3

trip inquiry 2 for 2 person(s)

check-in: hotel 25.09.2019 Bavaria for 1 night(s) 1 double bed room(s)
with breakfast, parking included

outward journey: self organised transport

journey back: self organised transport

no transfer

price: 90.00 EUR

HOTLINE TRAVEL AGENCY

0 end

1 new trip

2 search trip

3 show all trip offers

your choice: