Assessment

UML Modeling

Assessment instructions

Part 1 — Use case diagram.

Read the scenario below carefully.

Scenario

FlyHigh is a low-cost airline which offers customers the chance to fly all over Europe at low cost.

Passengers make bookings using the FlyHigh website. Most bookings involve the passenger entering the details of their flight. On some occasions passengers may purchase optional extras such as travel insurance or an additional baggage allowance.

At the airport, the passenger must check in. The check-in clerk will verify the passenger's identity and check them onto the flight. Most baggage is handed over as part of the normal check-in process, but if a passenger has a fragile item, this baggage is placed onto a separate conveyor belt and is handled more carefully.

When the passenger arrives at departures, they must pass a **security check**. Airport security will also verify the passenger's identity and may occasionally search the passenger. Most passengers are not physically searched in this way.

The passenger then goes to the boarding gate. Once a member of the cabin crew has opened the flight, passengers have their identities checked yet again before boarding the aircraft.

Task 1 (a)

Produce a use case diagram of the system described above.

(Your use case diagram must show actors, use cases and links (associations) and must also display appropriate **uses** and **extends** annotations.)

Task 1 (b)

Complete the standard documentation for the **Security Check** use case.

(If have named this use case differently, use this name when completing your documentation.)

Sample documentation

Use Case Documentation

Author name(s):	Date of creation:
System name:	
Description of system:	
Use case name:	**Use case number:**
Initiating actors:	**Receiving actors:**
Pre-conditions:	
List of scenarios and events	
1 Normal scenarios	
2 Abnormal scenarios	
Assumptions	
Post–conditions	

Part 2 — Class diagram

Read the scenario below carefully.

Scenario

FlyHigh is a company that allows its customers to purchase flights either by making a telephone call to its call centre or by using its web site directly. The online customers need to log on and follow the online booking procedure. The website will manage all aspects of the booking. telephone customers must make a phone call and speak to a member of the FlyHigh staff. All customers must provide a name, address & passport number, as well as their flight requirements.

There are two kinds of FlyHigh staff: Sales Clerks and Supervisors. Sales Clerks deal with telephone customers and will lead them through the booking process. They also cancel and change existing bookings. Supervisors do not deal with customers but perform several duties including running daily management reports & calculating daily sales figures. All members of FlyHigh staff have a name, employee number, a job title and a pay grade.

Once the customer has completed their dealings with the FlyHigh staff, they will be assigned to a suitable flight. Customers can book flights up to 6 months in advance.

When the customer arrives at the airport, they will use a member of the airport staff. There are two types: check-in staff and gate staff. Both of these types of staff deal with customers. The check-in staff will verify the customer's identity, check-in the customers to their flight and will advise of the departure gate as well as any delays. The check-in staff member will also issue a boarding card and update the flight records. The gate staff will also verify the customer's identity. They also check the passenger is at the correct boarding gate and they too update the flight records.

All airport staff have staff numbers, names, job titles and a security clearance level.

Flights have unique flight numbers, destination airports, plus arrival and departure times.

Task 2 (a)

Create a class diagram based around the following four classes:

- customer
- FlyHigh staff
- airport staff
- flight

Make sure your diagram clearly shows any generalisation relationships as well as any other relationships which exist between the classes. You do not need to worry about properties and methods for this diagram.

Task 2 (b)

Take any **one** of the superclasses as well as its subclasses and redraw this part of the diagram to include their properties and methods.

Part 3 — Activity diagram

Read the scenario below carefully.

Scenario

The passenger check-in process is a key part of the FlyHigh operation. Details of this process are explained below.

A passenger presents their passport and booking document to the clerk at the check-in desk. Once the clerk receives both of these documents, they use them to verify that the reservation is correct. If there are any problems with this verification, the passenger is refused boarding, and the passport is returned. Assuming the reservation is correct, the passenger is asked a series of security questions and, if their answers are acceptable, a boarding pass is printed. Should the answers to the questions be unacceptable, the passenger will be refused boarding and their passport is returned. If the passenger has luggage, this is checked in and a receipt is stuck onto the boarding card. The passenger is then handed back their boarding card and passport.

Task 3

Draw an activity diagram for the passenger check-in process. Make sure your diagram displays appropriate actions and logic flow. You must also label any decisions made and correctly show all inputs and outputs. The diagram should also be neatly drawn.

Part 4 — Sequence diagram

Read the scenario below carefully.

Scenario

Barney's Building Supplies has two kinds of customer: contractors and the general public. Sales to each are slightly different. When a contractor buys materials, he takes them to the contractor checkout desk. The clerk scans in the item to be purchased. The system creates an electronic ticket for the items. The system compares the total amount against the contractor's credit limit, and if it is acceptable, finalises the sale. The contractor's credit limit is reduced by the amount of the sale. Once a month, the system sends an invoice to the contractor and when the payment comes in, increases the credit limit back to the original value. The electronic ticket is maintained in the system and can be printed out at any time for the following 60 days. Some contractors like to keep a record of their purchases, so they request them to be

printed (usually at the time of the sale). Others aren't interested in a printout. A sale to the general public is simply entered into the cash register and a paper ticket is printed as the items are identified. Payment can be made by cash, credit card or cheque. The clerk must enter the type of payment to ensure that the cash register balances at the end of the shift. For credit card payments, the system prints out a credit card voucher that the customer must sign.

Task 4

Draw a sequence diagram for each of the processes of buying goods.