CSCI804 Assignment 1

(Total 10 marks, Due by 11:59 pm sharp on Sunday, 27 March, 2016)

Aims

This assignment aims to establish a basic familiarity with C++ classes. The assignment introduces increasingly object-based, C++ style of solution to a problem.

General Requirements

- You should observe the common principles of OO programming when you design your classes.
- You should make proper documentation and implementation comments in your codes where they are necessary.
- Logical structures and statements are properly used for specific purposes.

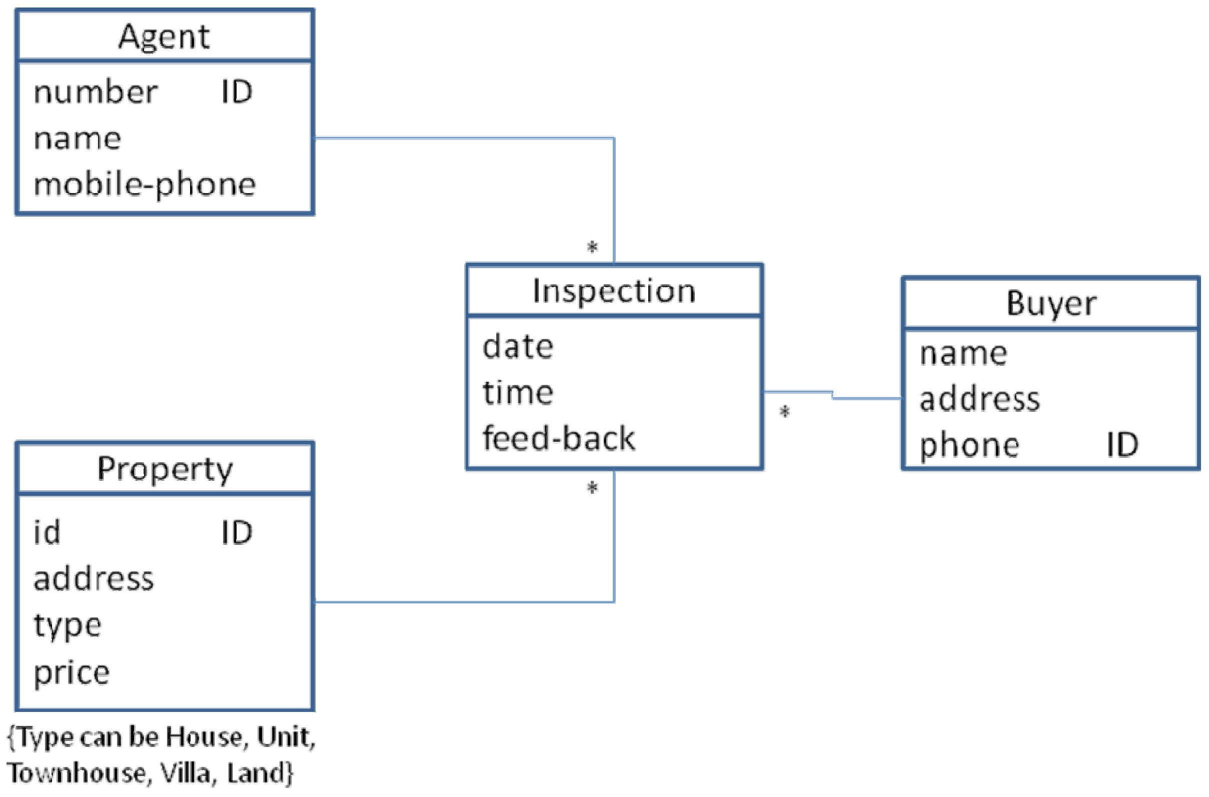
Objectives

On completion of these tasks you should be able to:

- code and run C++ programs using the development environment.
- make effective use of the on-line documentation system that supports the development environment.
- code programs using C++ in a hybrid style (procedural code using instances of simple classes) and in a more object-based style.
- manipulate string data.

Tasks:

In this assignment, you will design and implement classes that handle real estate properties inspections by using the following UML diagrams (ID means unique identifier).



Define a class **Agent** in a file **Agent.h** and implement constructors / destructor (if necessary), member functions in a file **Agent.cpp**.

Define a class **Property** in a file **Property.h** and implement constructors / destructor (if necessary), member functions in a file **Property.cpp**.

Define a class **Buyer** in a file **Buyer.h** and implement constructors / destructor (if necessary), member functions in a file **Buyer.cpp**.

Define a class **Inspection** in a file **Inspection.h** and implement constructors / destructor (if necessary), member functions in a file **Inspection.cpp**. Define and implement the functions **addNewBooking()**, **searchBookings()** and **saveBookings()** in this class to perform “book a new inspection”, “search inspection bookings” and “save inspection bookings”.

The types of data members are up to you.

Hint: The class Inspection may composite the classes (arrays) Agents, Properties and Buyers.

Implement **main()** function **and other necessary functions** in a file **realEstate.cpp.** The program loads data from the text files which names should be passed into the main() function by **the command line arguments** when it starts. The program loads data into the dynamic memories (No STL allowed), and displays the records that loaded from the text files. For example,

```
Load agents' records.
100; David Roman Volma; 0401123456
101; Bill Grace; 0403123321
102; Alice Brown; 0402111222
Load properties' information.
1001; 5/10 Northfields Ave, North Wollongong, NSW 2500; Townhouse; 280000
1002; 3 Moore Street, Wollongong, NSW 2500; House; 450000
1003; 23/87 Norman Street, NSW 2500; Unit; 210000
Load buyers' information.
Alice Smith; 1/2 Moore Street, Wollongong, NSW 2500; 0212345678
Bob Turyn; 23 Southland Road, Wollongong, NSW 2500; 0244123456
```

The text files **agents.txt**, **properties.txt** and **buyers.txt** for testing can be downloaded from elearning. See the section Testing for more details.

Hint: You may create dynamic arrays to store data above. Don't forget to delete those arrays before the program end.

Testing:

In the working directory on banshee, you can compile the program by

```
g++ –o ass1 realEstate.cpp Agent.cpp Property.cpp Buyer.cpp Inspection.cpp
```

Or to make it simple, you can compile the program by

```
g++ –o ass1 *.cpp
```

To run the program, you should pass the files' names to the main() by

```
./ass1 agents.txt properties.txt buyers.txt
```

Note: Do not define constant files' names inside the source code.

You can use bcheck to check if there is any memory leak by

```
bcheck ./ass1 agents.txt properties.txt buyers.txt
```

Then the program displays the following menu and gets input choices in a loop until the input choice is 0 (zero):

```
1. Book a new inspection.
2. Search inspection bookings.
Input choice (0-quit):
```

When the input choice is 1, the program will get inputs of a new booking and save the data into the dynamic memories. The function **addNewBooking()** in the class **Inspection** will be called to add a new booking in the memory. The inputs like following (**Note: Data in Red means input from the keyboard.**):

```
Add a new inspection.
Agent number: 100
Buyer phone: 0212345555
No such a buyer.
Buyer phone: 0212345678
Property id: 100
No such a property.
Property id: 1001
Inspection date (day month year): 10 3 2013
Inspection time (hour minute): 10 0
Comments: good
```

Suppose we have more inspection bookings,

```
1. Book a new inspection.
2. Search inspection bookings.
Input choice (0-quit): 1
Add a new inspection.
Agent number: 100
Buyer phone: 0212345678
Property id: 1002
Inspection date (day month year): 10 3 2013
Inspection time (hour minute): 10 30
Comments: very good
1. Book a new inspection.
2. Search inspection bookings.
Input choice (0-quit): 1
Add a new inspection.
Agent number: 101
Buyer phone: 0244123456
Property id: 1003
Inspection date (day month year): 11 3 2013
Inspection time (hour minute): 10 0
Comments: I want to see more houses
1. Book a new inspection.
2. Search inspection bookings.
Input choice (0-quit): 2
```

When the input choice is 2, the program will get input of an agent's number and find all inspections booked for him/her. The function **searchBookings()** in the class **Inspection** will be called to do the search.

```
Input agent number: 100
The agent: 100; David Roman Volma; 0401123456
has following inspections booked.
Property :1001; 5/10 Northfields Ave, North Wollongong, NSW 2500; Townhouse;
280000
by
Alice Smith; 1/2 Moore Street, Wollongong, NSW 2500; 0212345678
at
10/3/2013 10:0
Feedback: good
Property :1002; 3 Moore Street, Wollongong, NSW 2500; House; 450000
by
Alice Smith; 1/2 Moore Street, Wollongong, NSW 2500; 0212345678
at
10/3/2013 10:30
Feedback: very good

1. Book a new inspection.
2. Search inspection bookings.
Input choice (0-quit): 2
Input agent number: 101
The agent: 101; Bill Grace; 0403123321
has following inspections booked.
Property :1003; 23/87 Norman Street, NSW 2500; Unit; 210000
by
Bob Turyn; 23 Southland Road, Wollongong, NSW 2500; 0244123456
at
11/3/2013 10:0
Feedback: I want to see more houses
```

When the input choice is 0, the program will save the inspections' information into a text file and quit.

```
1. Book a new inspection.
2. Search inspection bookings.
Input choice (0-quit): 0
Save file to: insp.txt
```

When we check the text file insp.txt, we can find the file contains the following information.

```
Agent: 100; David Roman Volma; 0401123456
```

```
Property: 1001; 5/10 Northfields Ave, North Wollongong, NSW 2500; Townhouse;
280000
be inspected by a buyer:
Alice Smith; 1/2 Moore Street, Wollongong, NSW 2500; 0212345678
at 10/3/2013 10:0
Feedback: good
Agent: 100; David Roman Volma; 0401123456
Property: 1002; 3 Moore Street, Wollongong, NSW 2500; House; 450000
be inspected by a buyer:
Alice Smith; 1/2 Moore Street, Wollongong, NSW 2500; 0212345678
at 10/3/2013 10:30
Feedback: very good
Agent: 101; Bill Grace; 0403123321
Property: 1003; 23/87 Norman Street, NSW 2500; Unit; 210000
be inspected by a buyer: Bob Turyn; 23 Southland Road, Wollongong, NSW 2500;
0244123456
at 11/3/2013 10:0
Feedback: I want to see more houses
```

Submission

This assignment is due by 11.59 pm (sharp) on Sunday, 27 March, 2016.

Assignments are submitted electronically via the ***submit*** system. Make sure your source code can be compiled on banshee.

For this assignment you must submit all the files via the command (in one line):

```
submit -u your_user_name -c CSCI804 -a 1 realEstate.cpp Agent.h Agent.cpp Property.h
Property.cpp Buyer.h Buyer.cpp Inspection.h Inspection.cpp
```

and input your password.

Make sure that you use the correct file names. The Unix system is case sensitive. You must submit all files in one ***submit*** command line.

Your program code must be in a good programming style, such as good names for variables, methods, classes, and keep indentation.

Submission via e-mail is NOT acceptable.

After submit your assignment successfully, please check your email of confirmation. **You would loss 50% ~ 100% of the marks if your program codes could not be compiled correctly.**

Late submissions do not have to be requested. Late submissions will be allowed for a few days after close of scheduled submission (up to 3 days). Late submissions attract a mark penalty; this penalty may be waived if an appropriate request for special consideration (for medical or similar problem) is made via the university SOLS system *before* the close of the late submission time. No work can be submitted after the late submission time.

A policy regarding late submissions is included in the course outline.

The assignment is an **individual assignment** and it is expected that all its tasks will be solved **individually without any cooperation** with the other students. If you have any doubts, questions, etc. please consult your lecturer or tutor during tutorial classes or office hours. Plagiarism will result in a **<u>FAIL</u>** grade being recorded for that assessment task.

End of specification