National Taipei University of Technology

Communication Software Design (Fall, 2013)

Project 3

(Due: 2013/12/16, Monday before PM11:59)

(I) Project Descriptions:

You have to apply the concept of the Object-Oriented Programming (OOP) to rewrite and re-organize your programs in your previous project 1 and project 2, your program should now have to implement as a set of hierarchical classes.

Use inheritance. Figure 1 shows a sample class diagram:

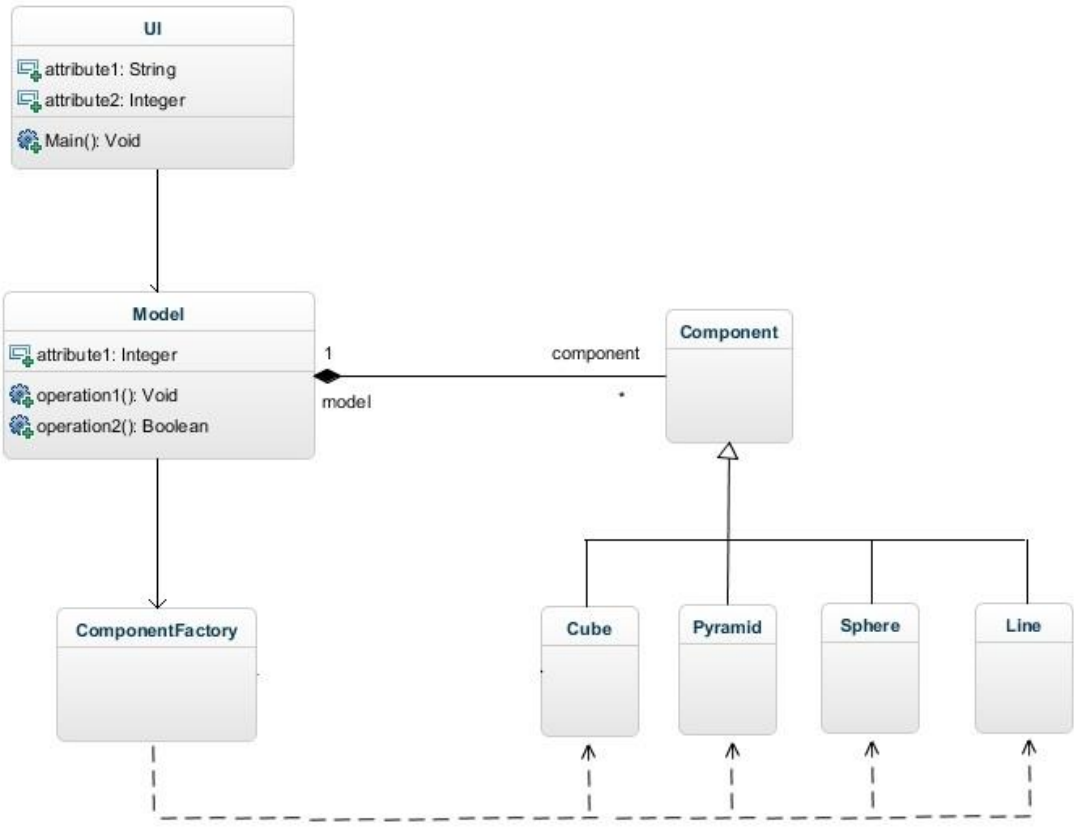

Figure 1.

There are many patterns can help you design a good OOP program,

you can find required knowledge in the following links:

https://www3.ntu.edu.sg/home/ehchua/programming/cpp/cp3_OOP.html
http://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller
http://www.laputan.org/pub/papers/POSA-MVC.pdf
http://en.wikipedia.org/wiki/Factory_method_pattern
http://en.wikipedia.org/wiki/Command_pattern
http://creately.com/diagram-type/article/simple-guidelines-drawing-uml-class-diagrams

Implement patterns is not necessary, but it can let your code more approach OOP and save more time in programming.

INPORTANT: You have to write you own class diagram after you finish your code.

In the third homework, two of new functions need to be implemented. The first is Edit, which enable user to edit a component's information. The second is a new shape line

Line

```
Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 9

Components:
```

Type	ID	Name
C	1	First Cube
S	2	First Sphere
P	3	First Pyramid
P	4	Second Pyramid
P	5	Third Pyramid
P	6	Fourth Pyramid
C	7	SC
C	8	Third Cube
S	9	Second Sphere
C	10	Fourth Cube
S	11	Third Sphere
S	12	FP

Groups:

GID	Name	Member
G1	gr1	1, 5, 12
G2	YUvs	2, 7

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 3

```
Select component type
[1]Cube [2]Pyramid [3]Sphere [4]Line
> 4

Enter component name
> L1

A component of Cube type added, name: L1, ID: 13

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 9

Components:
--------------------------------------------------------------------------
    Type      |     ID      |     Name
--------------------------------------------------------------------------
      C       |     1       |     First Cube
      S       |     2       |     First Sphere
      P       |     3       |     First Pyramid
      P       |     4       |     Second Pyramid
      P       |     5       |     Third Pyramid
      P       |     6       |     Fourth Pyramid
      C       |     7       |     SC
      C       |     8       |     Third Cube
      S       |     9       |     Second Sphere
      C       |     10      |     Fourth Cube
      S       |     11      |     Third Sphere
      S       |     12      |     FP
```

```
      L         |      13      |      L1
-------------------------------------------------------------------------------

Groups:
-------------------------------------------------------------------------------
   GID      |      Name      |      Member      |
-------------------------------------------------------------------------------
     G1      |      gr1         |      1, 5, 12
     G2      |      YUvs        |      2, 7
-------------------------------------------------------------------------------

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 3

Select component type
[1]Cube [2]Pyramid [3]Sphere [4]Line
> 4

Enter component name
> New L

A component of Cube type added, name: New L, ID: 14

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
```

[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 9

Components:

Type	ID	Name
C	1	First Cube
S	2	First Sphere
P	3	First Pyramid
P	4	Second Pyramid
P	5	Third Pyramid
P	6	Fourth Pyramid
C	7	SC
C	8	Third Cube
S	9	Second Sphere
C	10	Fourth Cube
S	11	Third Sphere
S	12	FP
L	13	L1
L	14	New L

Groups:

GID	Name	Member
G1	gr1	1, 5, 12
G2	YUvs	2, 7

Figure 2

Edit

```
Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 9

Components:
-------------------------------------------------------------------------
    Type     |     ID     |     Name
-------------------------------------------------------------------------
      C      |     1      |     First Cube
      S      |     2      |     First Sphere
      P      |     3      |     First Pyramid
      P      |     4      |     Second Pyramid
      P      |     5      |     Third Pyramid
      P      |     6      |     Fourth Pyramid
      C      |     7      |     SC
      C      |     8      |     Third Cube
      S      |     9      |     Second Sphere
      C      |     10     |     Fourth Cube
      S      |     11     |     Third Sphere
      S      |     12     |     FP
      L      |     13     |     L1
      L      |     14     |     New L
-------------------------------------------------------------------------

Groups:
-------------------------------------------------------------------------
   GID     |     Name     |     Member     |
```

```
--------------------------------------------------------------------------------
    G1      |     gr1         |     1, 5, 12
    G2      |     YUvs        |     2, 7
--------------------------------------------------------------------------------

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 4

Input component ID:
> 13

The component ID “13” is not exist.

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 4

Input component ID:
> 7
```

Select item or return to menu:
[1]”Type” [2]”Name” [3]Return to Menu
> 3

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 4

Input component ID:
> 7

Select item or return to menu:
[1]”Type” [2]”Name” [3]Return to Menu
> 1

Select new type:
[1]Cube [2]Pyramid [3]Sphere [4]Line
> X

The type option is not exist, select again.

Select new type:
[1]Cube [2]Pyramid [3]Sphere [4]Line
>2

Type edit success.

Graphical Modeling System

[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 9

Components:

Type	ID	Name
C	1	First Cube
S	2	First Sphere
P	3	First Pyramid
P	4	Second Pyramid
P	5	Third Pyramid
P	6	Fourth Pyramid
S	7	SC
C	8	Third Cube
S	9	Second Sphere
C	10	Fourth Cube
S	11	Third Sphere
S	12	FP
L	13	L1
L	14	New L

Groups:

GID	Name	Member
G1	gr1	1, 5, 12
G2	YUvs	2, 7

```
--------------------------------------------------------------------------------

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
> 4

Input component ID:
> 7

Select item or return to menu:
[1]”Type” [2]”Name” [3]Return to Menu
> 2

Input new name:
> ISU

Name edit success.

Graphical Modeling System
[1] Load a XML record
[2] Save a XML record
[3] Add component
[4] Edit
[5] Delete
[6] Group
[7] Redo
[8] Undo
[9] Display current table
[10] Back to Welcome menu
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> 9

Components:
-------------------------------------------------------------------------
    Type     |     ID     |     Name
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      C      |     1      |     First Cube
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      P      |     3      |     First Pyramid
      P      |     4      |     Second Pyramid
      P      |     5      |     Third Pyramid
      P      |     6      |     Fourth Pyramid
      S      |     7      |     ISU
      C      |     8      |     Third Cube
      S      |     9      |     Second Sphere
      C      |     10     |     Fourth Cube
      S      |     11     |     Third Sphere
      S      |     12     |     FP
      L      |     13     |     L1
      L      |     14     |     New L
-------------------------------------------------------------------------

Groups:
-------------------------------------------------------------------------
   GID     |     Name     |     Member     |
-------------------------------------------------------------------------
    G1     |     gr1      |     1, 5, 12
    G2     |     YUvs     |     2, 7
-------------------------------------------------------------------------
```

Figure 3

(II) Homework Report:

You have to write a report for this homework that should include the following items:

(1) The features that you finished in this homework.

(2) Write comment for each function. (Just be concise.)
(3) Snapshots of program execution.
(4) Measure the time that you spent in this homework. Please record the time
precisely in the following table.

homework#1(total: 18 hours)			
Date	Start	Stop	Comment
20131001	19:30	22:00	New / Load a XML record
20131002	19:00	21:45	Display current components
20131004	13:10	15:25	New / Load a XML record
20131007	14:55	17:30	Add component

Total hours: 10

(III) Homework Grading:

(1) Previous features(15%)
(2) Edit (10%)
(3) Line (10%)
(4) OOP (30%)
(5) Class diagram(10%)
(3) Coding style and code quality (20%)
(4) Report (5%)
You should avoid use QT function due to this course's object is to teach you C++, not QT. If it is necessary to use QT function (Ex. Qt GUI program will need to use QT function), just do it.

(IV) Homework Submission:

Please zip your homework before upload to e-learning.
And you must include:
(1) Your source code (the entire project)
(2) Report (both word and PDF)
If you failed to finish and upload your homework before limit, submit it to late homework folder or email it to me. There will be a discount for late work, and no score for late work after three days.

TA's email: t8820310@ntut.org.tw