#Homework 5 (11/25)

Rules:

- Deadline for completion of homework until: **15th December 2021 (23:59, *before midnight*)**
- **10 points will be deducted for one day delay**, you will get **0 points automaticaly** if you are 10 days late.
- **Upload your homework on Google Drive**, where the link has been provided as follows:
  - Compress your homework folder into .rar / .zip / .7z
  - Use your student id as the name for your homework, along with the homework code. (**Example:** 1086412_HW2.rar / 1086412_HW2.zip / 1086412_HW2.7z).
- If you want to ask a question and discuss with me about homework #5 you can find me at the lab on 9th December from 17:00~20:00.
- **No need to do a Demo**

Homework Case Tasks:

Case #1:
Create a program that can show the benefits of each membership's status in a supermarket:

Task 1 (15%) : Use 5 header file (.h) and 1 implementation file (.cpp) :

Task 2 (20%) : Save all of these information into **Member.h**

Id	Name	Phone Number	Total Transaction	Member Type
111	Peter	0901234567	24	Normal
333	Tobey	0907654321	45	Silver
555	Andrew	0907654123	67	Gold
777	Tom	0905674321	93	Diamond

Task 3 (20%) : Save all these information into all the header ***Normal_member.h***, ***Silver_member.h***, ***Gold Member.h***, and ***Diamond_member.h***.

Member Status	Benefits
Normal member (***Normal_member.h***)	Get discount 5%
Silver Member (***Silver_member.h***)	Get discount 10% + get 1 exclusive items per month
Gold Member (***Gold_member.h***)	Get discount 15% + Get 1 exclusive items per month + Get 1 Mc.D Voucher per month
Diamond Member (***Gold_member.h***)	Get discount 20% + Get 2 exclusive items per month + Get 1 Food Voucher per month + Get 1 exclusive items per year

Task 4 (15%) : Set user can do an input for Member ID and show the output like this:

Input:

Member ID: 777

Output:

- DIAMOND MEMBERSHIP -

ID : 777

Name : Tom

Phone : 0905674321

Total Transaction : 93

-MEMBER BENEFITS-

discount : 20%

Exclusive items per month: 2

Exclusive items per year: 1

Food Voucher per month: 1

Input:

Member ID: 111

Output:

- NORMAL MEMBERSHIP -

ID : 111

Name : Peter

Phone : 0901234567

Total Transaction : 24

-MEMBER BENEFITS-

discount : 5%

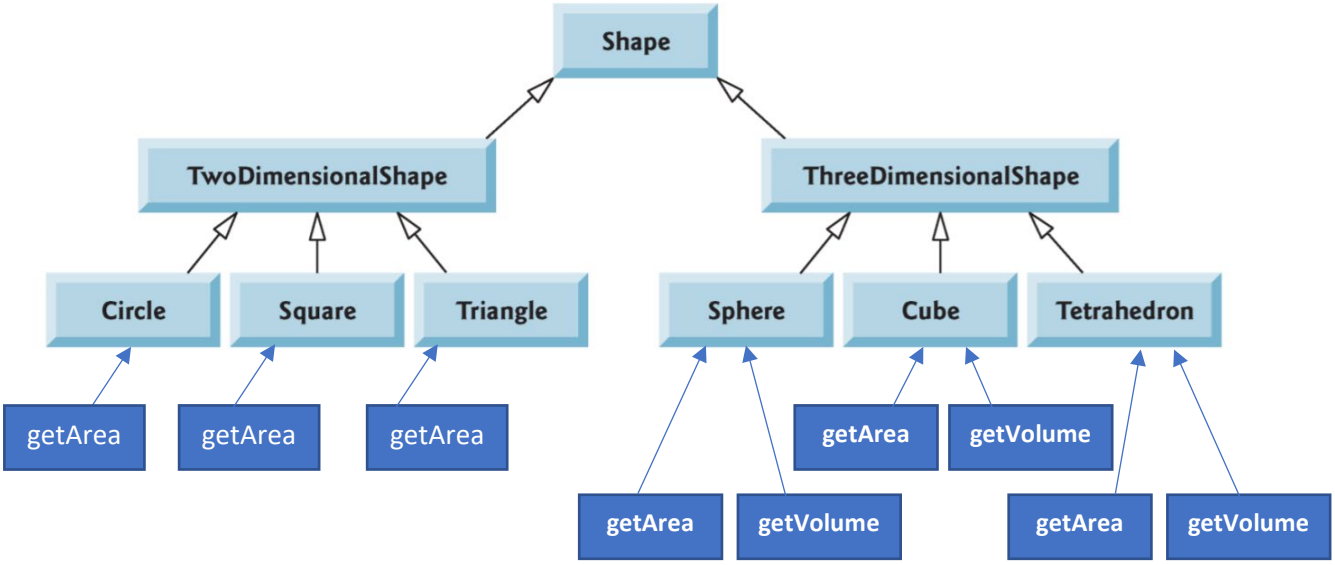
Exclusive items per month: 0

Exclusive items per year: 0

Food Voucher per month: 0

Case #2:

Task 5 (30%): Create a program that uses a vector of shape pointers to objects of each concrete class in the hierarchy. The program should print the object to which each vector element points. Also, in the loop that processes all the shapes in the vector, determine whether each shape is a ***TwoDimensionalShape*** or a ***ThreeDimensionalShape***. If the shape is ***TwoDimensionalShape*** display its ***area***. If a shapeis a ***ThreeDimensionalShape*** display its ***area*** and ***volume.***



Output

Circle
area: -----

Square
area: -----

Triangle
area: -----

Sphere
area: -----
volume: -----

Cube
area: -----
volume: -----

Tetrahedron
area: -----
volume: -----

Shape	Area	Volume
Circle	$A = \pi r^2$	X
Square	$A = a^2$	X
Triangle	$A = \frac{h_b b}{2}$	X
Sphere	$A = 4\pi r^2$	$V = \frac{4}{3}\pi r^3$
Cube	$A = 6a^2$	$V = a^3$
Tetrahedron	$A = \sqrt{3}a^2$	$V = \frac{a^3}{6\sqrt{2}}$

TA Information:

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** If you have any questions, please ask me, thank you.*