Lab06: Inheritance

> **MUTube** is a video sharing platform where users can watch, like, share, comment and upload their own videos. In this lab, you have to implement a program to manage MUTube's member accounts. Suppose that MUTube offers two types of member: *Free* and *Premium member*. **Free members** can download video up to 3 videos on the list. **Premium members** can watch video uninterrupted by ads (ad-free) and can download unlimited videos. However, Premium members have to pay a monthly membership fee. The `Video` Class and `MemberTester` Class are provided.

Your task is to create Three Classes (`Member`, `FreeMember`, **and** `PremiumMember`**) by following the provided Class Diagram to practice your skills on inheritance concepts.**

Member
- email: String
- password: String
- vdoList: ArrayList<Video>

+Member(email: String, password: String)
+addVideo(vdo: Video): boolean
+removeVideo(vdo: Video): boolean
+printMemberInfo(): void

Video
- title: String
- url: String

+Video(aTitle: String, aURL: String)
+getTitle(): String
+getURL(): String
+isEqual(Video vdo): boolean
+toString(): String

Extends

FreeMember
- FREE_LIMITED_VDOs: int
- numDownloadedVDO: int

+ FreeMember(email: String, password: String)
+ addVideo (vdo: Video): boolean
+removeVideo(vdo: Video): boolean
+printMemberInfo(): void
+getNumVideo(): int

Extends

PremiumMember
- fee: double

+PremiumMember(email: String, password: String, fee: double)
+printMemberInfo(): void

Member Class
- `addVideo (Video vdo)`: If the vdo is not null, this method adds the vdo into the variable `vdoList` and returns *true*. If the vdo is null, return *false*.
- `removeVideo(Video vdo)`: If the vdo is found in the `vdoList`, removes it from the list, then prints a successful message and returns *true*. If the vdo is not found in the `vdoList`, returns *false*.
- `printMemberInfo()`: Print information including email, password, and list of videos (Please see the expected output for the exact format)

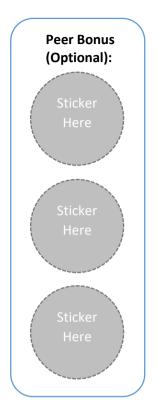## FreeMember Class (This class extends Member class)
- `FREE_LIMITED_VDOs` is the maximum videos that free member can download (the value = 3)
- **Overriding** the following methods:
  - `addVideo (Video vdo)`: If the number of videos in the `vdoList` reaches the limit, prints a warning message and returns *false*. Otherwise, adds the vdo and returns *true*.
  - `removeVideo(Video vdo)`: If the vdo is found in the `vdoList`, removes it from the list, decreases the number of videos, and returns *true*.
  - `printMemberInfo()`: Prints a message "---- FREE MEMBER ----" and general member information.
- **Add subclass method** `getNumVideo()`: Returns number of downloaded videos.

PremiumMember Class (This class extends Member class)
- **Overloading**: the constructor method to receive an extra required parameter "`fee`"
- **Overriding:** `printMemberInfo()`: Prints a message "---- PREMIUM MEMBER ----" and general information.

Expected output

```
Task 1: Adding new video into a free member account
Title: [ICT Training]: How to start JAVA Lessons:4
 URL: http://www.mutube.com?url=e5b6a344-27ee-4a26-aea3-bb5969984124
cannot be downloaded because the number of the video is reaching the limit.
Title: [ICT Training]: How to start JAVA Lessons:5
 URL: http://www.mutube.com?url=c5594f81-f935-4549-967f-df80163f0cc9
cannot be downloaded because the number of the video is reaching the limit.
*******************************
Task 2: Remove/add a video from a free account
Title: [ICT Training]: How to start JAVA Lessons:2
 URL: http://www.mutube.com?url=65c984d1-f6bc-4a0b-8193-1d1d4dbf69de
is successfully removed.
*******************************
Task 3: Display free member information
---- FREE MEMBER ----
Email: dooMaidoo@mu.edu (pwd: 1234)
List of Videos
[1] Title: [ICT Training]: How to start JAVA Lessons:1
 URL: http://www.mutube.com?url=853e88da-2949-4295-84b2-9b0e4c552fc2
[2] Title: [ICT Training]: How to start JAVA Lessons:3
 URL: http://www.mutube.com?url=6b978d49-ba8a-4bbb-8d53-d63653eddcf3
[3] Title: [ICT Training]: How to start JAVA Lessons:4
 URL: http://www.mutube.com?url=e5b6a344-27ee-4a26-aea3-bb5969984124
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*******************************
Task 4: Add/remove new videos into premium member account
Title: [ICT Training]: How to start JAVA Lessons:3
 URL: http://www.mutube.com?url=6b978d49-ba8a-4bbb-8d53-d63653eddcf3
is successfully removed.
*******************************
Task 5: Display premium member information
---- Premium MEMBER ----
Member fee: 399.0
Email: likeGods@mu.edu (pwd: 9876)
List of Videos
[1] Title: [ICT Training]: How to start JAVA Lessons:1
 URL: http://www.mutube.com?url=853e88da-2949-4295-84b2-9b0e4c552fc2
[2] Title: [ICT Training]: How to start JAVA Lessons:2
 URL: http://www.mutube.com?url=65c984d1-f6bc-4a0b-8193-1d1d4dbf69de
[3] Title: [ICT Training]: How to start JAVA Lessons:4
 URL: http://www.mutube.com?url=e5b6a344-27ee-4a26-aea3-bb5969984124
[4] Title: [ICT Training]: How to start JAVA Lessons:5
 URL: http://www.mutube.com?url=c5594f81-f935-4549-967f-df80163f0cc9
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```

Challenge Bonus (Optional): Modify PremiumMember class

Suppose each premium member can select an option to share a premium account with at most two persons (Family FEE).

- Add a static filed `Family_FEE` = 80.00
- Add `addFamily(String username)`: If the username is not empty, adds it to the list, prints the successful message and returns *true*. Otherwise, it returns *false*.
- Add `removeFamily(String username)`: If the username is found, removes it from the list and returns true. Otherwise, it prints a warning message and returns *false*.
- Add `getMothlyBill()`: The monthly bill includes the premium member fee and family fee. The member has to pay 80.00 per month per family.
- **Overridding** `printMemberInfo()`: to prints premium member information and a list of family.

PremiumMember
- fee: double
- Family_FEE: double
- family: ArrayList<String>
+PremiumMember(email: String, password: String, fee: double)
+printMemberInfo(): void
+addFamily(String username): boolean
+removeFamily(String username): boolean
+getMonthlyBill(): double

Expected output

```
Challenge 1: Add/Remove Family members
alan@turing is added successfully.
bill@gates is added successfully.
user: steve@job cannot be added, the Family user
is reached the limit
bill@gates is removed successfully.
user: bill@gates does not exist and cannot be removed.
*****************************
Challenge 2: Get a monthly bill of premium member account
The monthly bill: 479.0
*****************************
Challenge 3: Display premium member info
---- Premium MEMBER ----
Member fee: 399.0
Email: likeGods@mu.edu (pwd: 9876)
```
```
List of Videos
[1] Title: [ICT Training]: How to start JAVA Lessons:1
 URL: http://www.mutube.com?url=db7a26f4-12ff-4aab-a958-f3aba3bf8511
[2] Title: [ICT Training]: How to start JAVA Lessons:2
 URL: http://www.mutube.com?url=2e17e3ac-cb43-4ab4-9c59-4d2e6f20e450
[3] Title: [ICT Training]: How to start JAVA Lessons:4
 URL: http://www.mutube.com?url=1ba71eab-faac-4c11-b09e-ccc86b4ba935
[4] Title: [ICT Training]: How to start JAVA Lessons:5
 URL: http://www.mutube.com?url=89e4b6bb-8fd1-4d25-b6ec-ef1c21411086
--------------------
List of Family
alan@turing,
*****************************
```