"Yagami e-Books is one of the leading online book resource for avid readers. They need an object-oriented solution for their operation. Yagami classifies the visitors on their website into different types of readers, such as mangaworm, comicnerd, studygeek and freader (freader: fancy term for free-reader). All of these readers pay an annual fee except for freaders, who can access limited content.

Mangaworm readers can access all available manga (in case you don't have a taste and don't know what a manga is: https://en.wikipedia.org/wiki/Manga). Comicnerds can read all the available comic books. Similarly, studygeeks can read all the course books an unlimited number of times.

Each of these readers can rate the books they read based on specific criteria for each book type. Each manga can be rated based on their art style. Comicbooks can be rated on the basis of their panel size. Each of the course books can be rated according to their learning value.

Other than that, each reader can choose Top 3 books (favorite books) among their respective category.

There is another category named freader. Since they are potential subscribers, these users are allowed to read any type of book (manga, comics or course books). However, they can only read a limited number of books, after which they are asked to pay a fee. Furthermore, to manage the load on their system, Yagami only allows a fixed number of freaders.

Apart from all this, Yagami rewards its mangaworms, comicnerds and studygeeks according to their certain attributes. This attribute simply determines how passionate a reader is in their respective category. Mangaworms are rewarded based on their mangameter, comicnerds are rewarded based on their comicfactor, while studygeeks are rewarded based on their studyscale. For freaders, rewards are given if they have a high mangameter, comicfactor and studyscale, all at once.
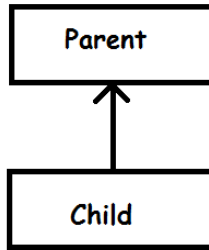
Read the assumptions and then perform the tasks. (*Advice: Take your time while reading assumptions*)

Assumptions:

1. You may create or modify any variables and/or create or override any functions if needed to satisfy the requirements of the question. But their role in the program have to be justifiable.
2. The value of mangameter can be in the range 1-100. Any value above 50 is considered a reward-worthy value.
3. The value of comicfactor should be in range 1-10. Any value above 8 is considered a reward-worthy value.
4. The value of studyscale should be a real value between 0 and 1. Any value above 0.6 is assumed to be a reward-worthy value.
5. The title of books (be it manga, comics or course books) can only be specified as a string.
6. A freader can only read 15 books before they are blocked.
7. A total of only 5 freaders are allowed in the system.

Tasks to be performed:

a) Identify all the classes and draw a diagram to depict the relationships between them. Use the following template as reference:

b) While keeping the assumptions in mind, implement the scenario given and provide proper code for each aspect. Your code should contain all the constructors, variables and functions wherever they need to be.

c) Are there any functions that were overriden in your program? List them down (if any) and give a reason.

d) Are there any functions that were overloaded in your program? List them down (if any) and give a reason.

e) Add a user-defined copy constructor to create a copy of an existing freader.