C++ Programming

Pyramid of Object Oriented

Homework

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Teaching, Training and Coaching since more than a decade!

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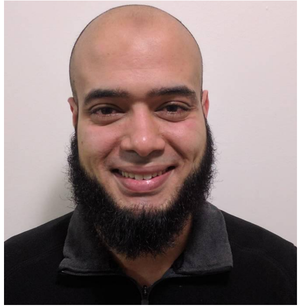
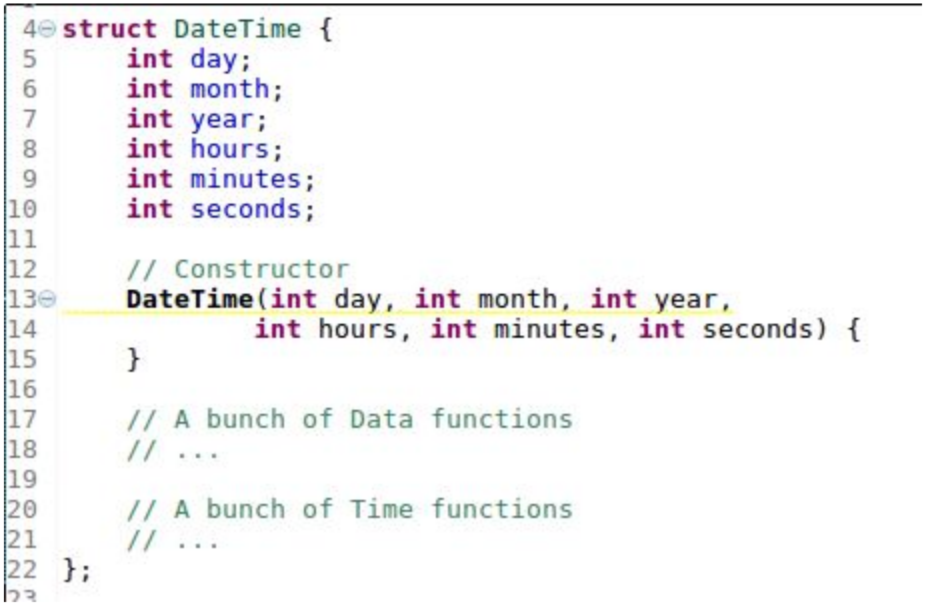


Homework (1): Date & Time

- The usage of **Date** information is very common in development. As a junior software engineer, your team lead asked you to think in date struct.
  - What are the possible **data members**?
  - What are the possible **member functions**? No requirements. Be flexible, as this is an **infrastructure** struct
  - Printing Concern: Users may want to a string representation in different ways
    - Year, Month, Day - Month, Year - Day-Month
- What about a **Time** class (hour, minute, seconds):
  - Describe 2 different ways to be potential member variables
    - Assume you recognized one of them and your college another one
    - Both of you debate a lot which one to use
    - Defend the 2 choices. How to make a final decision instead of debating for hours?

Homework (2) - Design Review

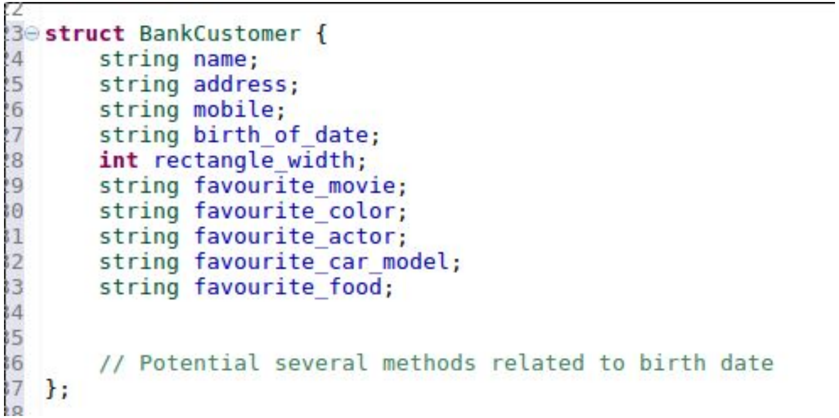


```
struct DateTime {
    int day;
    int month;
    int year;
    int hours;
    int minutes;
    int seconds;

    // Constructor
    DateTime(int day, int month, int year,
            int hours, int minutes, int seconds) {
    }

    // A bunch of Data functions
    // ...

    // A bunch of Time functions
    // ...
};
```

- Your college designed and implemented DateTime Class
  - Jointly supports the Date & Time
- The code passed all **unit** testings
- Think in a critical design tip
  - Provide your feedback!

Homework (3) - Design Review

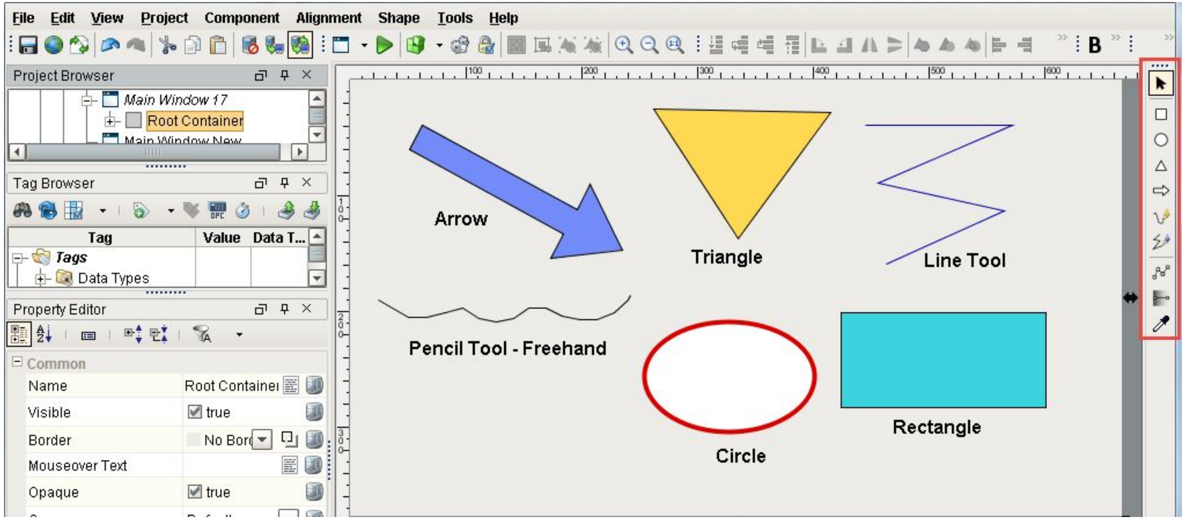
- Your team is developing a banking application. Provide useful feedback to your teammate.
    - Think in the current data members?
        - All of them are relevant for a person?
        - All of them are relevant for a bank customer application?
        - Convenient datatype?
    - Think in 2+ missing critical data members



```
struct BankCustomer {
	string name;
	string address;
	string mobile;
	string birth_of_date;
	int rectangle_width;
	string favourite_movie;
	string favourite_color;
	string favourite_actor;
	string favourite_car_model;
	string favourite_food;


	// Potential several methods related to birth date
};
```

Homework (4) - Shapes

- Think in Rectangle, Triangle, Circle in a Drawing application
  - ○ What are common things between them? What is special in each of them?
  - ○ Think in terms of data members, member function **names** & functions **behaviour**



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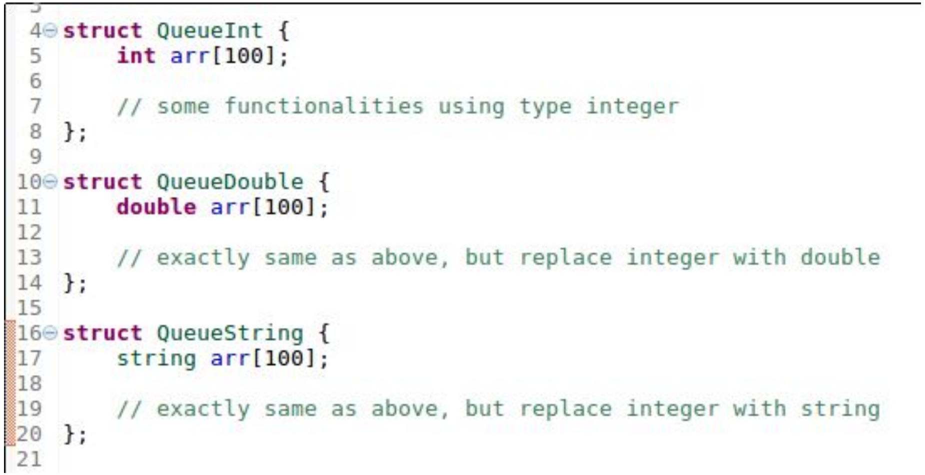
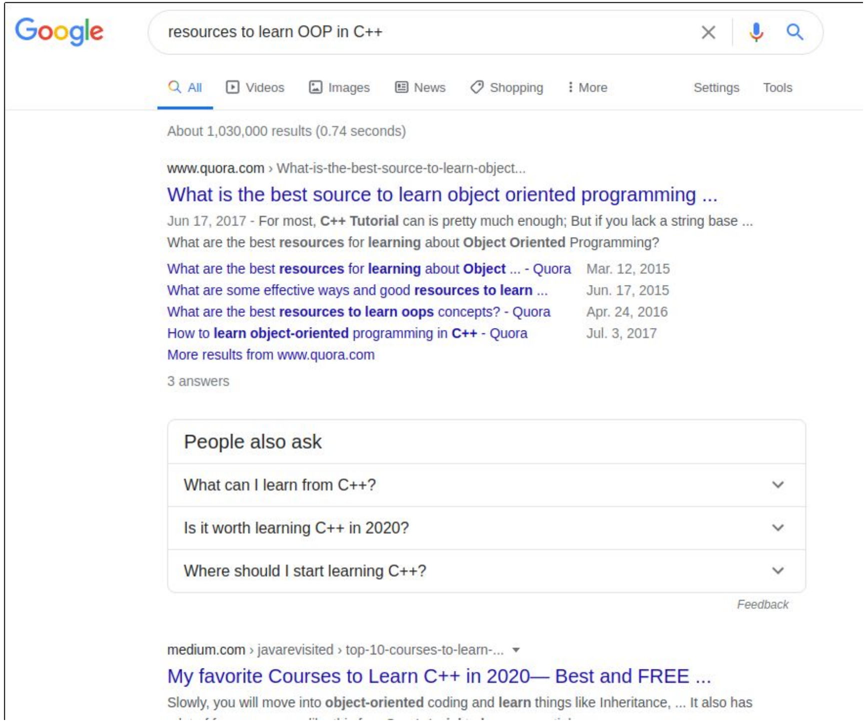
Homework (5): Queues



```
struct QueueInt {
    int arr[100];

    // some functionalities using type integer
};

struct QueueDouble {
    double arr[100];

    // exactly same as above, but replace integer with double
};

struct QueueString {
    string arr[100];

    // exactly same as above, but replace integer with string
};

```

- This code is working properly
- What is the problem in these code?
- What if we want to add Employee Queue
- Do u remember how STL did magical thing to solve that?

Homework (6): Google Search Engine



About 1,030,000 results (0.74 seconds)

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What is the best source to learn object oriented programming ...

Jun 17, 2017 - For most, **C++ Tutorial** can is pretty much enough; But if you lack a string base ...
What are the best **resources** for **learning** about **Object Oriented** Programming?

What are the best **resources** for **learning** about **Object** ... - Quora	Mar. 12, 2015
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3 answers

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Slowly, you will move into **object-oriented** coding and **learn** things like Inheritance, ... It also has

- To search in Google, you mainly give a query
  - You can add some tricks also
- Then you can customize results
  - E.g. Only since 2020 + Videos
- Thinking about implementation
  - The engine code base is huge, but we only know a few high level functionalities? What is good in **hiding** things from a user?

Homework (7): What vs How

- 1) Task:
  - What: Sum from 1 to N in 2 ways
  - How: Explain 2 approaches to implement above task
- 2) Snapseed is an app for Image Manipulation (e.g. crop, rotate, draw, etc)
  - It is available for Android, IOS, IPAD
  - In terms of what & how: provide some insights
    - E.g. function to fill color in rectangle?
    - E.g. function to read image from device?
  - Imagine we found a bug in some function
    - Or faster way to do it
    - How to structure our app code base to do the minimum code changes?

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About Date & Time

- Although seems trivial, Date & time are source of **pain & bugs** in software
  - Learn Why & Examples
  - Learn how to properly handle
  - A lot of your future tasks will seems easy. With deep thoughts:
    - Your realize critical concerns or different trade-offs among different designs
- Year 2038 problem / Year 2000 problem
- Leap second:
  - Nearly all modern operating systems assume that 1 day = 24 × 60 × 60 = 86400 seconds in all cases. In UTC, however, about once every year or two there is an extra second, called a "leap second." The leap second is always added as the last second of the day, and always on December 31 or June 30. For example, the last minute of the year 1995 was 61 seconds long, thanks to an added leap second. Most computer clocks are not accurate enough to be able to reflect the leap-second distinction. (src)

“Acquire knowledge and impart it to the people.”

“Seek knowledge from the Cradle to the Grave.”