Chapter 7 - Intro to Classes (7.9 - 7.12)

The class is a C++ construct used to create objects which are fundamental to object-oriented programming (OOP).

- OOP hides the details of objects from objects of other types
- When an object needs information from another object or needs another object to perform a task, it sends a message to the object requesting what it needs
- As a result, object-oriented programs can be written more generically than structured programs
- Usually, making changes to the object-oriented programs is easier than changing structured programs
A class is a user-defined datatype that is defined by the programmer. A class consists of variables and functions with a general format as follows:

```cpp
class ClassName
{
    // Declarations for member variables and member functions
};
```
the person class

class Person
{
public:
    int age;  // Member Variable

    int returnAge();
    int returnBirthYear();
};

......

int main()
{
    Person person;
person.age = 28;
    cout << "person is: " << person.returnAge();
    cout << "person was born in: "
         << person.returnBirthYear();
    return 0;
}
person class method definitions

```cpp
int Person::returnAge()
{
    return age;
}
```

```cpp
int Person::returnBirthYear()
{
    return 2010 - age;
}
```
private vs public

- Class data members and member functions can be either private or public

- Private data members and member functions can only be accessed within the class in which it is defined

- Public data members and member functions can be accessed from inside or outside of the class in which it is defined
private vs public example

class Person
{
private:
   int age;
public:
   void setAge(int);
   int returnAge();
   int returnBirthYear();
};

int main()
{
   Person person;
   person.setAge(28);
   cout << "person is: " << person.returnAge() << endl;
   cout << "person was born in: " << person.returnBirthYear();
   return 0;
}
A mutator is any method that can change the value of a member variable

```cpp
void Person::setAge(int newAge)
{
    age = newAge;
}
```

An accessor is a method that uses a class member but does not change its value
class Time
{
    private:
        int hour; // 0 - 23 (24-hour clock format)
        int minute; // 0 - 59
        int second; // 0 - 59

    public:
        void setTime(int h, int m, int s);
        void printUniversal(); // 13:27:06
        void printStandard(); // 1:27:06 PM

}; // end class Time
class questions

Q1: How many members does class time have? List them.

Q2: How many methods does class time have? List them.

Q3: How many mutators does class time have? List them.

Q4: How many accessors does class time have? List them.
class questions

P1: Write the definitions of the member functions?
class questions

Q5: Where would they be written?

Q6: How do we create objects of the class Time?
   A regular object
   An array of objects

P2: Write C++ code that shows how you would use the objects to call the member functions?
class questions

P2: Write C++ code that shows how you would use the objects to call the member functions?