

# C Programming (W9)



Welcome!!

Please check attendance individually.  
(Mobile App)

# Things to do today

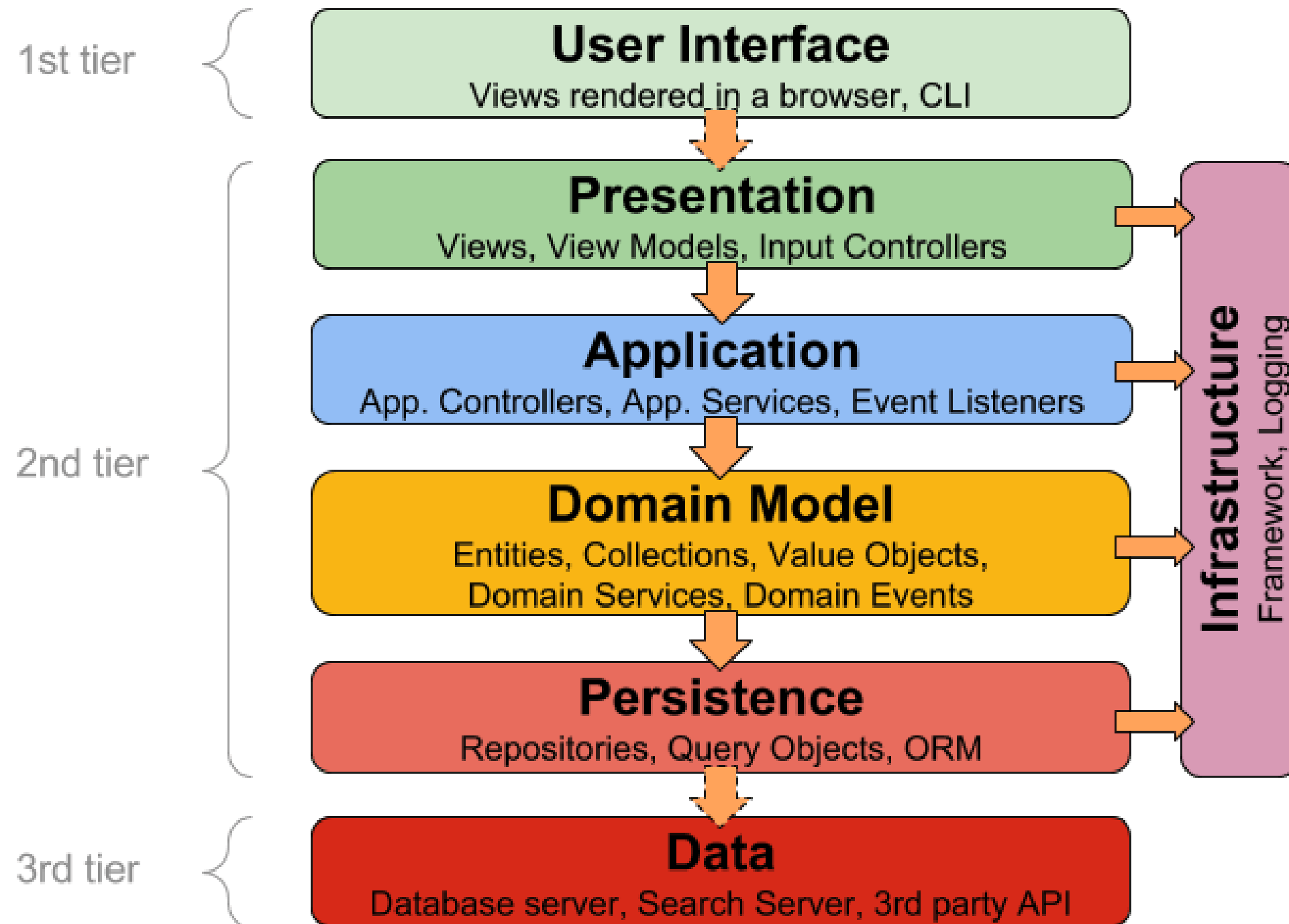
**01**

Lecture Notes (Ch.8 ~ 9)  
- Functions & Variables

**02**

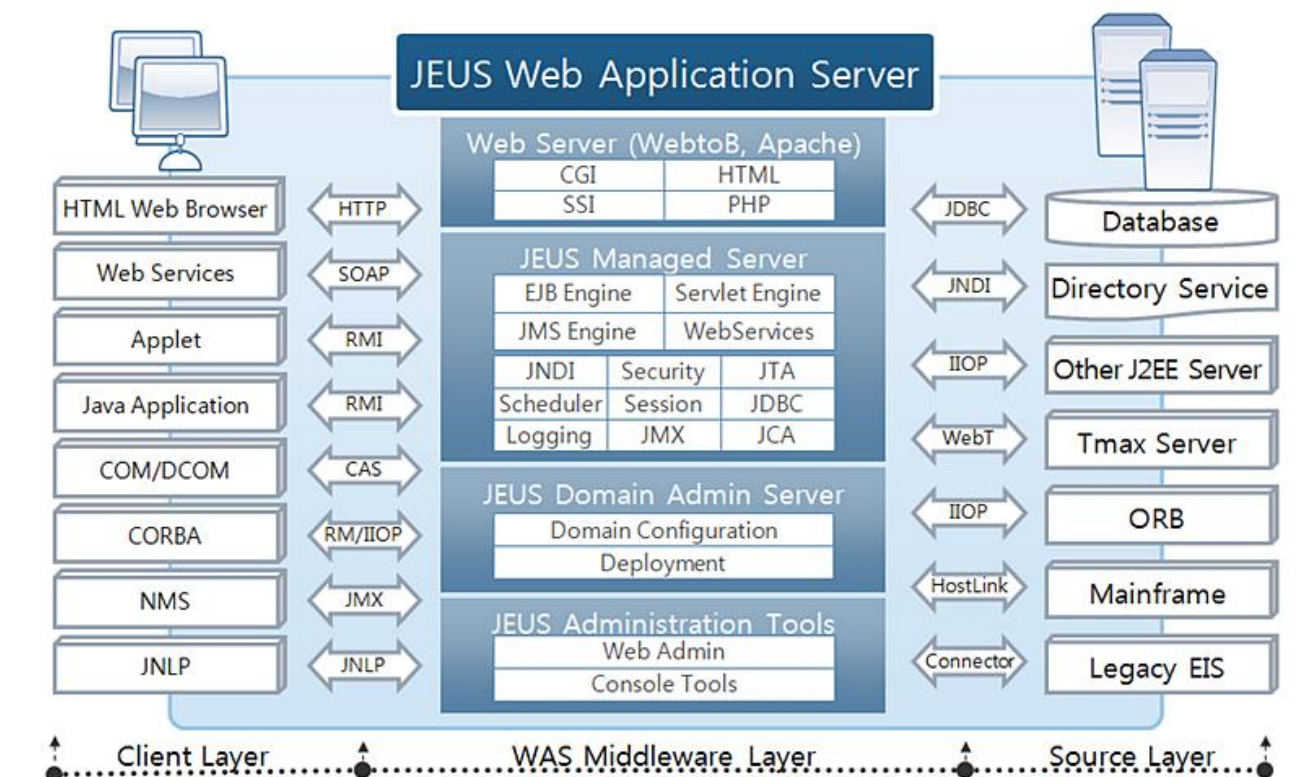
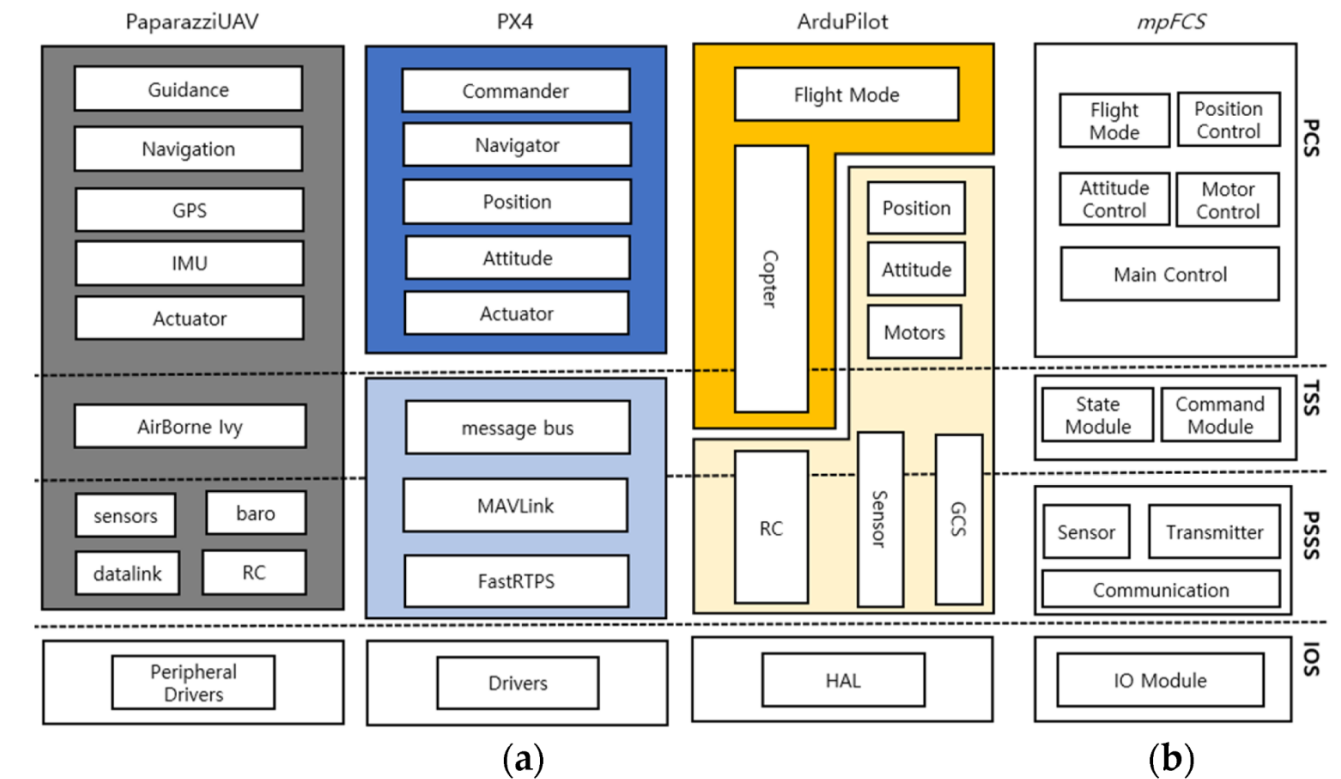
**03**

# SW Structure (Big picture)



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SW Area: UI, UX, App, Middleware, Driver, DB, Network  
(how to communication? API, interface)



## Header files: Std Lib

C:\MinGW64\include

C:\MingW64\x86\_64-w64-mingw32\include

C:\my\_project\_folder\include

**Object file : gcc -c main.c -o main.o**

**Executable file : gcc main.o -o main**

C:\MingW64\x86\_64-w64-mingw32\lib

### 1. Student characteristics get/set functions ( student.h, student.o )

**int setStudentInfo(char\* name, char\* ID, char\* gender);**

**char\* getName(int id);     /     char\* getID(char\*);     /     char\* getGender(char\*);**

### 2. Grade-related get/set functions ( grade.h, grade.o )

**int setScore(char\* name, char\* class, int score);     /     int getScore(char\* name, char\* class);**

### 3. Statistics-related functions (statistics.h, statistics.o )

**int getTotalScore(char\* name);**

**int getAverage(char\* name);**

**int getGradeRanking(char\* name);**

# Library

| File Type       | Extension                   | Purpose  | Linking Type      | Usage  |
|-----------------|-----------------------------|--|-------------------|--|
| Object File     | .o                          | Contains compiled code for a single source file.     | Static or Dynamic | Intermediate file created during compilation, linked to create executable.   |
| Static Library  | .lib (Windows)<br>.a (Unix) | Collection of object files packaged together.        | Static            | Linked into executable at compile time; no external dependencies at runtime. |
| Shared Library  | .so (Unix)                  | Dynamic library loaded at runtime.                   | Dynamic           | Shared among multiple programs, linked at runtime.                           |
| Dynamic Library | .dll (Windows)              | Similar to .so, used on Windows for dynamic linking. | Dynamic           | Loaded at runtime by programs that use the library.                          |

Ex) codespace => nm ch7.o

# Function

Material Producer(Farmer) - Language Developer

Wholesaler - Library Developer

Retailer - Framework Developer

Chef - Application Developer (Student - Program Learner) ➡ C : C Language + Standard Lib (header + object)  
Python : Python Language + Standard Lib + Framework

In the case of cooking, it is divided by the degree of completion of the ingredients, and the usage of each ingredient is distributed to the upper user.

In the case of the program, it is divided by the task scope, and the usage of each function is distributed to the upper user.



# Structure (Student grading system at school)

## Well-Organized functions

(Re-use @ Elementary, middle, and high schools, all schools)

### Functions for specific purposes:

#### 1. Statistics-related functions

- get total score
- get average
- get average of the entire class
- get average by school

#### 2. Grade-related get/set functions

- get math class score
- get C class score

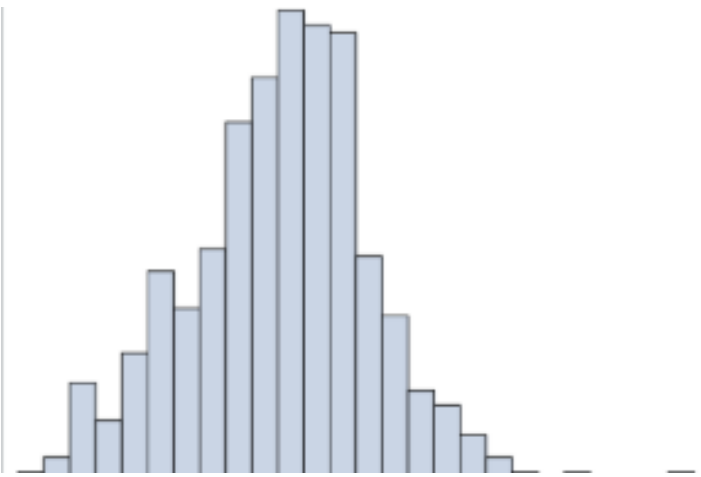
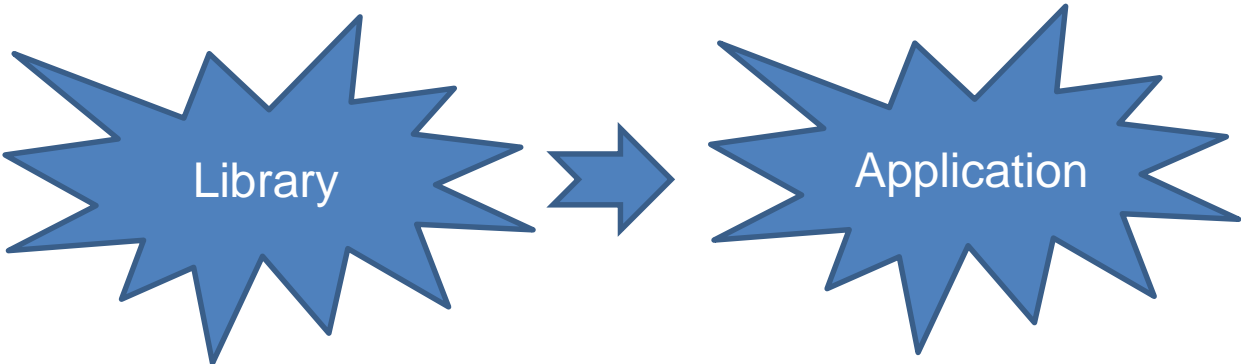
#### 3. Student characteristics get/set functions

- set / get name
- set / get ID
- set / get gender

Common Features  
ID, Name, Gender, Score etc



| Student ID | Name       | Gender | Age | English Grade | Math Grade | Science Grade |
|------------|------------|--------|-----|---------------|------------|---------------|
| 1          | John Doe   | Male   | 15  | A             | B          | B+            |
| 2          | Jane Smith | Female | 16  | B+            | A-         | A             |
| 3          | Tom Brown  | Male   | 14  | C             | C          | C+            |
| 4          | Sarah Lee  | Female | 15  | A-            | B+         | A-            |
| 5          | Alex Wang  | Male   | 16  | A+            | A+         | A+            |



See you next week!

DO NOT miss the classes

