Data Structures 2022
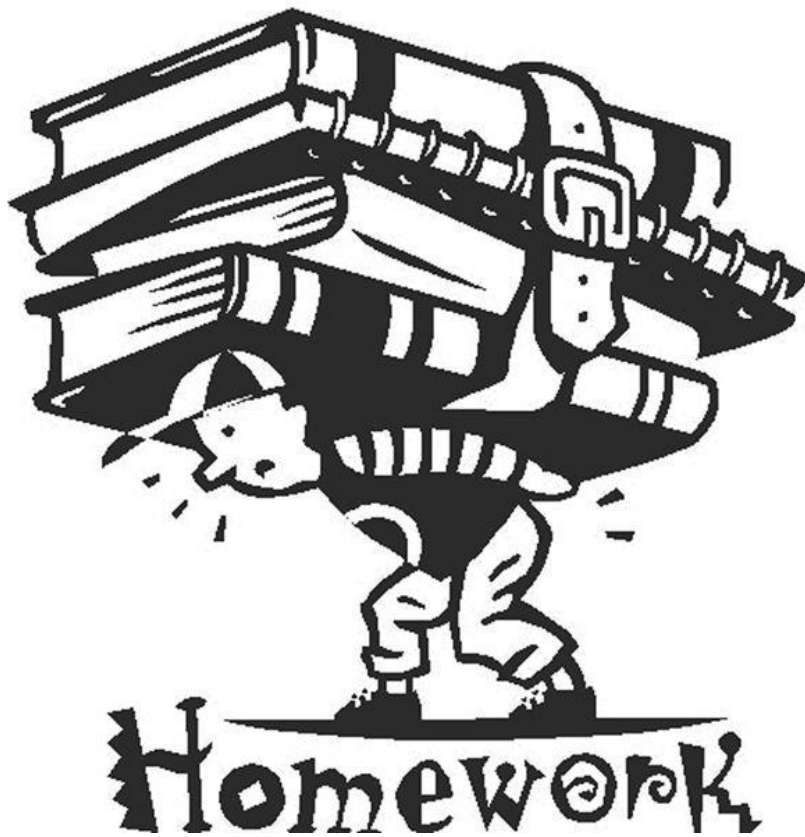
Homework #2

- Write a C++ program that inputs general real-numerical expressions line by line and then outputs their results. "EOI" means the end of input.
  - Only non-negative real numbers can be input as operands.
  - Three types of parentheses can be input.
    - "( )", "{ }", and "[ ]"
  - Only 4 binary operators can be used as operators:
    - *, /, +, and -
    - * and / have higher precedence than + and -.
    - Notice that, for example, 13.0/5.0 = 2.6 and 13.2+5.3 = 18.5.

Homework #2

- Write a C++ program that inputs general real-numerical expressions line by line and then outputs their results. "EOI" means the end of input.
  - The result is always a real number and it can be a negative value.
    - Round off to the nearest thousandth. (12.34567 → 12.346)
  - When exceptions such as unbalanced parentheses or "/0.0" occur, print "Error!: {reason}\n" and process next input lines.
    - Unbalanced parentheses → "Error!: unbalanced parentheses\n"
    - "###/0.0" → "Error!: divided by zero\n"

Examples

- Input

  {10.1+8.4*4.8}/2.2

  (19.2-8.6)/[12.4-3.1*4.0]

  (10.1*(8.4+4.8)}/2.9

  [5.3/2.5+{7.7-3.9*2.6}]*(0.8+30.9)

  {5.4/2.4+(7.9-3.2*2.4)}*([2.5+30.1]-{10.6+8.0*4.1}/2.5)

  EOI

- Output

  22.918

  Error!: divide by zero

  Error!: unbalanced parentheses

  -10.144

  37.643

Due Date

- Soft deadline: **November 10, 2022**

- Hard deadline: November 17, 2022
  - But, deduct 10% per one day from your original score

Submission Date	Deduction Rate
November 11	10%
November 12	20%
November 13	30%
November 14	40%
November 15	50%
November 16	60%
November 17	70%
November 18	100%

Notice (cont'd)

- You should use **stack** template class in STL.
  - Library: #include<stack>
- You should observe the format of input & output exactly.

- You should submit a compressed file (**HW2_your-ID.zip**) containing the following two files to the web-site (https://klas.kw.ac.kr).
  - **HW2_your-ID.hwp**, **-.doc**, or **-.pdf** // report document
  - **HW2_your-ID.cpp** or **-.cc** // source code

Notice (cont'd)

- ## Source code
  - It should be compiled in **Visual Studio 2010 or higher, or g++**
    - **You should note your environment in your report.**
  - Your name and student ID should be noted at the top of your source files in the form of comment.

- ## Report
  - Free format
  - But it must include several examples for testing your program and your own discussion.
  - It will be an important factor for getting a good score.
  - Mention your compiler