Course Introduction

Programming (II)

元智大學 資訊工程學系
Department of Computer Science & Engineering

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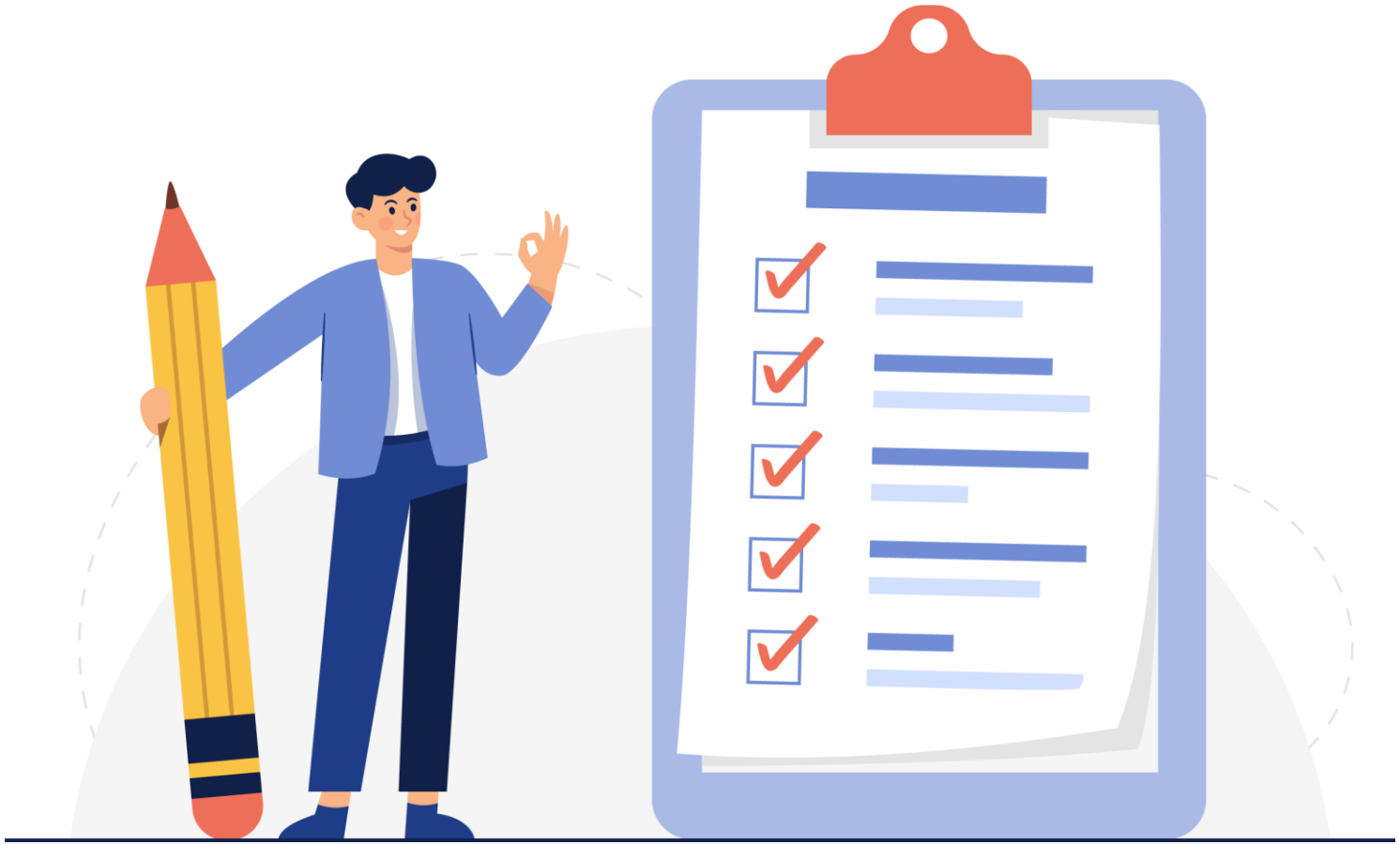
Course outline

Chapter 1	Introduction of Object-Oriented Design
Chapter 2	Starting with C++
Chapter 3	Function in C++
Chapter 4	Class and Object in C++
Chapter 5	Constructor and Destructor
Chapter 6	Operator Overloading
Chapter 7	Inheritance in C++
Chapter 8	Pointer to Object and Virtual Functions
Chapter 9	Input-Output and Manipulator in C++
Chapter 10	File Handling in C++
Chapter 11	Template Programming
Chapter 12	Exception Handling in C++

Prerequisites

- Programming language:
  - Programming I

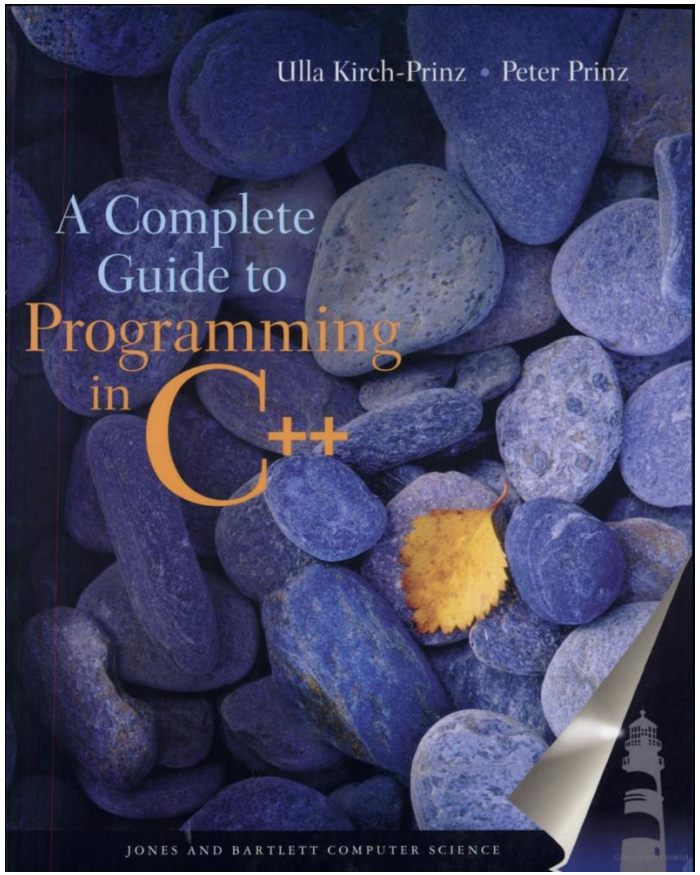


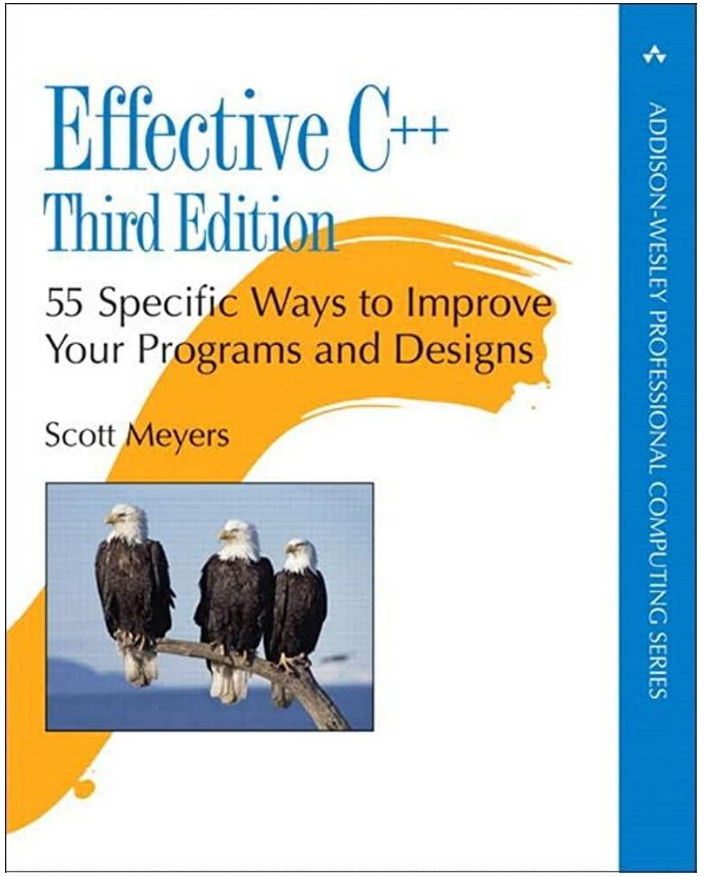
Course Grading

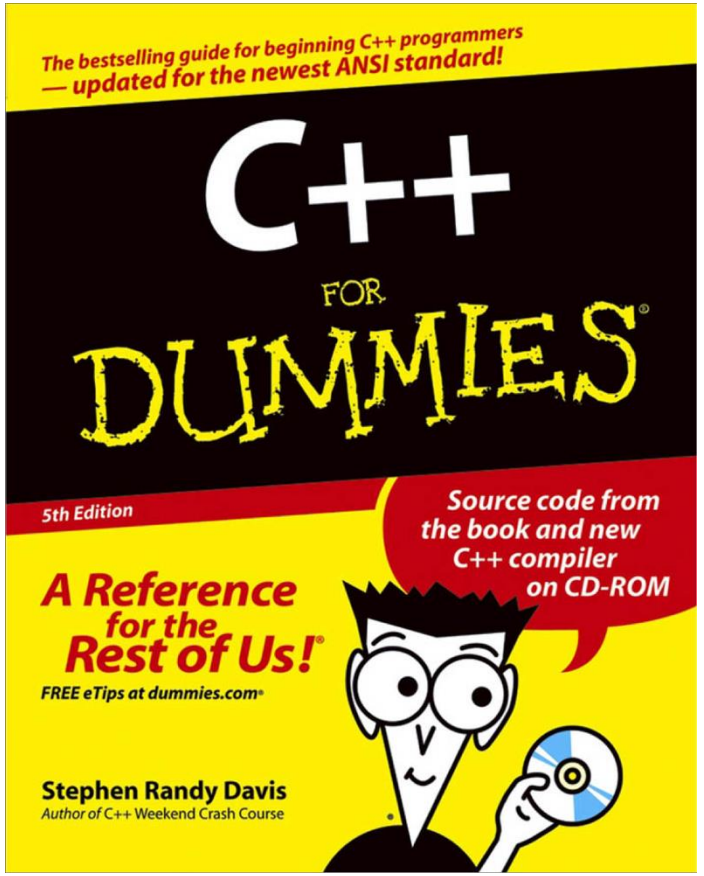
- **Homework:** 5 ~ 7 homework
  - No late submission.
  - Can use any IDE (Dev-C++, Visual Studio, Codeblocks).
  - Can not implement external library (if the question is not mention it).
- **Midterm Exam:** Solving Problems.
- **Final Exam:** Solving Problems.
- **In-class:** Attendance.

	Midterm Grade	**Final Grade**
Homework	40 %	30 %
Midterm Exam	40 %	30 %
Final Exam		30 %
Attendance	10 %	10 %
In-class	10 %	10%
	100%	**110%**

References


Ulla Kirch-Prinz • Peter Prinz
A Complete Guide to Programming in C++
JONES AND BARTLETT COMPUTER SCIENCE


Effective C++
Third Edition
55 Specific Ways to Improve Your Programs and Designs
Scott Meyers
ADDISON-WESLEY PROFESSIONAL COMPUTING SERIES


The bestselling guide for beginning C++ programmers — updated for the newest ANSI standard!
C++ FOR DUMMIES
5th Edition
Source code from the book and new C++ compiler on CD-ROM
A Reference for the Rest of Us!
FREE eTips at dummies.com
Stephen Randy Davis
Author of C++ Weekend Crash Course

Q&A

Questions and Answer

WARM UP  QUIZZES

Do not using any IDE or ChatGPT, answer these questions.

Quiz 1

What is the result of this expression:

```
5 > 1
```

a. -1
b. 0
c. 1
d. false

Quiz 2

What is the value of x after we excute this statement:

```
char x = 65.6;
```

a. 6
b. 65
c. 66
d. Syntax error

Quiz 3

To exit the loop midway, we use the statement:

a. exit
b. stop
c. continue
d. break

Quiz 4

What is the output of this program:

a. 0
b. 1
c. 5
d. 10

```c
#include <stdio.h>

int main(){
    int a,c,b=10;
    a=c=5;
    printf("%d",b==a+c);
}
```

Quiz 5

What is the result of this expression:

```
5 / 10 * 100
```

a. 5
b. 10
c. 0
d. Another result

Quiz 6

What is the return value of this command:

```
stricmp("abc","ABC");
```

a. 0
b. 32
c. -1
d. 1

Quiz 7

What is the output of this program:

a. 13
b. 32
c. 26
d. 60

```c
#include<stdio.h>


int main(){
        int s, i, j;
        s=0;
        for (i=1; i<=5; i++)
                for( j=1; j<=6; j++)
                        s=s+2;
        printf("%d",s);
        return 0;
}
```

Quiz 8

What is the output of this program:

a. -1
b. 1
c. 10
d. The program falls into an *infinite loop*.

```c
#include <stdio.h>

int main(){
    int n=10;
    while (n>=n) n--;
    printf("%d",n);
    return 0;
}
```

Quiz 9

What is the output of this program:

a. 2
b. 4
c. 32
d. The program falls into an *infinite loop*.

```
#include<stdio.h>


int main(){
        int a = 2;
        for (int i=1; i>=5; i++);
                a = a * a;
        printf("%d",a);
        return 0;
}
```

Quiz 10

What is the output of this program:

a. 10 15 5 12 18 20

b. 10 12 18 20

c. 20 18 12 10

d. 5 15

```
#include <stdlib.h>
#include <conio.h>
int main()
{
    int a[] = {10, 15, 5, 12, 18, 20};
    int n = 5;
    for (int i = n; i>= 0; i--)
        if (a[i] %2 !=0 )
            printf("%5d",a[i]);
    return 0;
}
```

WARM UP EXERCISES

Do not using any IDE or ChatGPT, write your code on paper

Exercise 1

Write a program to input from keyboard 3 numbers a, b and c. Display the entered values in ascending order using only one extra variable.

Input:	34	12	28
Output:	12	28	34

Exercise 2

Write a program to calculate the following sums:

- S0 = n! = 1*2*…*n
- S1 = $1 + \frac{1}{2} + \cdots + \frac{1}{n}$
- S2 = $1 + \frac{1}{2!} + \cdots + \frac{1}{n!}$

Exercise 3

Write a program to reverse a 1-dimensional array.

Input: Please input n: 8

1 2 3 4 5 7 9 10

Output: 10 9 7 5 4 3 2 1

Exercise 4

Write a program to print to the screen the first *n* items of *Fibonacci* sequence using a recursive function.

$$F_n = \begin{cases} 1 \quad if \;\; n = 0 \; or \; n = 1 \\ F_{n-2} + F_{n-1} \quad if \; n \geq 2 \end{cases}$$

Input: Input n: 6

Output: 1 1 2 3 5 8

Exercise 5

Define a structure

```
struct profile{
    string fullname;
    double score;
    string grade;
};
```

Write a program to input the name and score of n students.
Letter Grade is calculated by the following on the right
Calculate letter grade for n students and print as example

Score	Letter Grade
>= 9.0	A
>= 8.0 && < 9.0	B+
>= 7.0 && < 8.0	B
>= 6.0 && < 7.0	C+
>= 5.0 && < 6.0	C
>= 4.5 && < 5.0	D+
>= 4.0 && < 4.5	D
< 4.0	F

Output:

```
FULL NAME          SCORE       GRADE
-----------------------------------------
Lin Jia-Hao        7.5         B
Huang Mei-Ling     4.7         D+
Chen Zhi-Yong      9.2         A
```

Thank you for your attention