과제 5

[실습제목: 문제지 9]

과 목 명	C 프로그래밍
교 수 명	김 병 정
학 번	20237107
작 성 자	하 태 영
제 출 일	2025.12.10

한림대학교

문제 C91-0010

C91-0010.c > ...

```c
#include <stdio.h>
typedef struct {
    char name[20];
    int age;
    int id;
} Student;

int main() {
    Student s;
    scanf("%s %d %d", s.name, &s.age, &s.id);
    printf("Name: %s\nAge: %d\nID: %d\n", s.name, s.age, s.id);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeon
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0010
John 20 202301
Name: John
Age: 20
ID: 202301
```

문제 C91-0012

C91-0012.c > ...

```c
#include <stdio.h>

typedef struct {
    char title[30];
    char author[30];
    int price;
} Book;

int main() {
    Book b;
    scanf("%s %s %d", b.title, b.author, &b.price);
    printf("Title: %s\nAuthor: %s\nPrice: %d\n", b.title, b.author, b.price);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeon
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0012
CProgramming
Kim
25000
Title: CProgramming
Author: Kim
Price: 25000
```

문제 C91-0015

C91-0015.c > ...

```c
#include <stdio.h>

typedef struct {
    int width, height;
} Rectangle;

int main() {
    Rectangle r;
    scanf("%d %d", &r.width, &r.height);
    printf("Area: %d\n", r.width * r.height);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0015
4 5
Area: 20
```

문제 C91-0016

C91-0016.c > ...

```c
#include <stdio.h>

typedef struct {
    int hour;
    int minute;
} Time;

int toMinutes(Time t) {
    return t.hour * 60 + t.minute;
}

int main() {
    Time t1, t2;
    scanf("%d %d", &t1.hour, &t1.minute);
    scanf("%d %d", &t2.hour, &t2.minute);
    printf("Difference: %d minutes\n", toMinutes(t2) - toMinutes(t1));
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0016
10 15
12 45
```

문제 C91-0017

C91-0017.c > ...

```c
#include <stdio.h>

typedef struct {
    char name[20];
    int kor, eng, math;
} Student;

int main() {
    Student s;
    scanf("%s %d %d %d", s.name, &s.kor, &s.eng, &s.math);
    double avg = (s.kor + s.eng + s.math) / 3.0;
    printf("Average: %.2f\n", avg);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeon
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0017
Alice 80 90 100
Average: 90.00
```

문제 C91-0020

C91-0020.c > ...

```c
#include <stdio.h>
#include <math.h>

typedef struct {
    int x, y;
} Point;

double distance(Point a, Point b) {
    return sqrt((a.x - b.x)*(a.x - b.x) + (a.y - b.y)*(a.y - b.y));
}

int main() {
    Point p1, p2;
    scanf("%d %d", &p1.x, &p1.y);
    scanf("%d %d", &p2.x, &p2.y);
    printf("Distance: %.2f\n", distance(p1, p2));
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeon
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0020
1 1
4 5
Distance: 5.00
```

문제 C91-0022

C91-0022.c > ...

```c
#include <stdio.h>

typedef struct {
    int x, y;
} Point;

int main() {
    Point p;
    int dx, dy;
    scanf("%d %d", &p.x, &p.y);
    scanf("%d %d", &dx, &dy);
    printf("New Position: (%d, %d)\n", p.x + dx, p.y + dy);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeon
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0022
0 0-5 2
New Position: (-5, 2)
```

문제 C91-0030

C91-0030.c > ...

```c
#include <stdio.h>

typedef struct {
    char name[20];
    int age;
} Person;

void sort(Person arr[], int n) {
    for (int i = 0; i < n-1; i++)
        for (int j = i+1; j < n; j++)
            if (arr[i].age > arr[j].age) {
                Person tmp = arr[i];
                arr[i] = arr[j];
                arr[j] = tmp;
            }
}

int main() {
    Person p[3];
    for (int i = 0; i < 3; i++) scanf("%s %d", p[i].name, &p[i].age);
    sort(p, 3);
    for (int i = 0; i < 3; i++) printf("%s %d\n", p[i].name, p[i].age);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeon
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0030
Tom 21
Jane 18
Bill 30
Jane 18
Tom 21
Bill 30
```

문제 C91-0035

C91-0035.c > ...

```c
#include <stdio.h>

typedef struct {
    char subject[20];
    int score;
} Score;

int main() {
    Score s[3];
    for (int i = 0; i < 3; i++) scanf("%s %d", s[i].subject, &s[i].score);

    int max = 0;
    for (int i = 1; i < 3; i++)
        if (s[i].score > s[max].score)
            max = i;

    printf("%s %d\n", s[max].subject, s[max].score);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeon
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0035
Math 70
English 85
Science 90
Science 90
```

문제 C91-0040

C91-0040.c > ...

```c
#include <stdio.h>

typedef struct {
    char name[30];
    int price;
    int discount;
} Product;

int main() {
    Product p;
    scanf("%s %d %d", p.name, &p.price, &p.discount);
    double result = p.price * (100 - p.discount) / 100.0;
    printf("Discounted Price: %.1f\n", result);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeon
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0040
Phone 500000 10
Discounted Price: 450000.0
```

문제 C91-0001

C92-0001.c > ...

```c
// 구조체 포인터 함수 선언
#include <stdio.h>
typedef int int32 ;
typedef struct myadd MYADD; //typedef 선언
struct myadd //구조체틀 생성
{
    int32 arr[2];
    int32 result;

    void (*pmyadd_struct)(MYADD *); //포인터 함수 선언
};

int32 myadd_val(int32* x_arr)  // 지역변수printf("result : %d + %d = %d \n",
                               // myadd1.arr[0],myadd1.arr[1],
                               // myadd1.result); 이용 (Call By Value-Return)
{
    return x_arr[0] + x_arr[1];
}

void myadd_ref(int32* x_arr, int32* x_reult) // 지역변수 이용 (Call By Reference-Return)
{
    *x_reult = x_arr[0] + x_arr[1];
}

void myadd_struct(MYADD *x_myadd)
{
    // 구조체 포인터 x_myadd를 통해 멤버 arr[0]과 arr[1]의 합을 result에 저장
    x_myadd->result = x_myadd->arr[0] + x_myadd->arr[1];
}

int main()
{
    MYADD myadd1;  //16byte 구조체 생성
    myadd1.arr[0] = 3;
    myadd1.arr[1] = 4;
    myadd1.pmyadd_struct = myadd_struct;  //구조체 포인터함수 대입

    myadd1.pmyadd_struct(&myadd1);    //구조체 포인터함수 이용
    printf("result : %d + %d = %d \n",
    myadd1.arr[0], myadd1.arr[1], myadd1.result);

}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro C기초 문제지(9) % cd "/Users/hataeyeong
rs/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C92-0001
result : 3 + 4 = 7
```

추가문제

문제 C91-0110

추가문제 > C C91-0110.c > ...

```c
#include <stdio.h>

typedef struct {
    int a, b;
} Pair;

int getMax(Pair p) {
    return p.a > p.b ? p.a : p.b;
}

int main() {
    Pair p;
    scanf("%d %d", &p.a, &p.b);
    printf("Max: %d\n", getMax(p));
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Users/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0110
10 7
Max: 10
```

문제 C91-0120

추가문제 > C C91-0120.c > ...

```c
#include <stdio.h>

typedef struct {
    int width;
    int height;
} Rectangle;

int getArea(Rectangle r) {
    return r.width * r.height;
}

int main() {
    Rectangle r;
    scanf("%d %d", &r.width, &r.height);
    printf("Area: %d\n", getArea(r));
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Un
sers/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0120
4 5
Area: 20
```

문제 C91-0130

추가문제 > C C91-0130.c > ...

```c
#include <stdio.h>

typedef struct {
    double x, y;
} Point;

Point getMidpoint(Point a, Point b) {
    Point mid;
    mid.x = (a.x + b.x) / 2.0;
    mid.y = (a.y + b.y) / 2.0;
    return mid;
}

int main() {
    Point p1, p2;
    scanf("%lf %lf", &p1.x, &p1.y);
    scanf("%lf %lf", &p2.x, &p2.y);
    Point mid = getMidpoint(p1, p2);
    printf("Midpoint: (%.1f, %.1f)\n", mid.x, mid.y);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeon
eyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/"C91-0130
1 3
5 7
Midpoint: (3.0, 5.0)
```

문제 C91-0140

추가문제 > C C91-0140.c > ...

```c
#include <stdio.h>
#include <string.h>

typedef struct {
    char name[30];
    int age;
} Student;

Student findLongestName(Student s[], int n) {
    int max = 0;
    for (int i = 1; i < n; i++) {
        if (strlen(s[i].name) > strlen(s[max].name))
            max = i;
    }
    return s[max];
}

int main() {
    Student s[3];
    for (int i = 0; i < 3; i++) {
        scanf("%s %d", s[i].name, &s[i].age);
    }
    Student result = findLongestName(s, 3);
    printf("Longest Name: %s\n", result.name);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Users/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0140
Tom 20
Elizabeth 22
Ann 21
Longest Name: Elizabeth
```

문제 C91-0150

추가문제 > C C91-0150.c > ...

```c
#include <stdio.h>
#include <string.h>

#define MAX 100

typedef struct {
    char name[30];
    int age;
} Student;

Student findLongestName(Student arr[], int n) {
    int maxIdx = 0;
    for (int i = 1; i < n; i++) {
        if (strlen(arr[i].name) > strlen(arr[maxIdx].name)) {
            maxIdx = i;
        }
    }
    return arr[maxIdx];
}

int main() {
    Student students[MAX];
    int count = 0;

    while (count < MAX) {
        scanf("%s", students[count].name);
        if (strcmp(students[count].name, "xxx") == 0) {
            break;
        }
        scanf("%d", &students[count].age);
        count++;
    }

    if (count > 0) {
        Student longest = findLongestName(students, count);
        printf("Longest Name: %s\n", longest.name);
    }

    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Uni
sers/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0150
Tom 20
Elizabeth 22
Ann 21
xxx 0
Longest Name: Elizabeth
```

문제 C91-0160

추가문제 > C C91-0160.c > ...

```c
#include <stdio.h>
#include <string.h>

#define MAX 100

typedef struct {
    char name[30];
    int age;
} Student;

void sortByName(Student arr[], int n) {
    for (int i = 0; i < n - 1; i++) {
        for (int j = i + 1; j < n; j++) {
            if (strcmp(arr[i].name, arr[j].name) > 0) {
                Student temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }
}

void sortByAge(Student arr[], int n) {
    for (int i = 0; i < n - 1; i++) {
        for (int j = i + 1; j < n; j++) {
            if (arr[i].age > arr[j].age) {
                Student temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }
}
```

```c
int main() {
    Student students[MAX];
    int count = 0;

    // 입력 받기
    while (count < MAX) {
        scanf("%s", students[count].name);
        if (strcmp(students[count].name, "xxx") == 0) break;
        scanf("%d", &students[count].age);
        count++;
    }

    // 정렬 기준 입력
    char criterion[10];
    scanf("%s", criterion);

    if (strcmp(criterion, "name") == 0) {
        sortByName(students, count);
    } else if (strcmp(criterion, "age") == 0) {
        sortByAge(students, count);
    }

    // 출력
    for (int i = 0; i < count; i++) {
        printf("%s %d\n", students[i].name, students[i].age);
    }

    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Un
sers/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0160
Tom 20
Elizabeth 22
Ann 21
xxx 0
nameTom 20
Elizabeth 22
Ann 21
```

문제 C91-0170

추가문제 > C C91-0170.c > ...

```c
#include <stdio.h>
#include <string.h>

typedef struct {
    char name[20];
    int kor, eng, math;
} Student;

// 함수 인수를 포인터로 받도록 수정 (Student 구조체 복사 방지)
double getAverage(const Student *s) {
    return (s->kor + s->eng + s->math) / 3.0;
}

// 함수 인수를 포인터로 받고, 반환형도 포인터로 유지
// 이제 반환되는 주소는 main 함수의 유효한 메모리를 가리킵니다.
const char* getTopStudent(const Student *a, const Student *b) {
    // 포인터이므로 -> 연산자 사용
    // getAverage 함수도 포인터를 받도록 수정해야 함
    return getAverage(a) >= getAverage(b) ? a->name : b->name;
}

int main() {
    Student s1, s2;
    scanf("%s %d %d %d", s1.name, &s1.kor, &s1.eng, &s1.math);
    scanf("%s %d %d %d", s2.name, &s2.kor, &s2.eng, &s2.math);

    // 함수를 호출할 때 주소( & )를 전달
    printf("Top: %s\n", getTopStudent(&s1, &s2));
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Users/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0170
Alice 95 90 85
Bob 90 90 90
Top: Alice
```

문제 C91-0210

추가문제 > C C91-0210.c > ...

```c
#include <stdio.h>

typedef struct {
    char name[20];
    int age;
} Student;

void increaseAge(Student* s) {
    s->age += 1;
}

int main() {
    Student s;
    scanf("%s %d", s.name, &s.age);
    increaseAge(&s);
    printf("%s %d\n", s.name, s.age);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/U
sers/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0210
Tom 20
Tom 21
```

문제 C91-0220

추가문제 > C C91-0220.c > ...

```c
#include <stdio.h>

typedef struct {
    int x, y;
} Point;

void movePoint(Point* p, int dx, int dy) {
    p->x += dx;
    p->y += dy;
}

int main() {
    Point p;
    int dx, dy;
    scanf("%d %d", &p.x, &p.y);
    scanf("%d %d", &dx, &dy);
    movePoint(&p, dx, dy);
    printf("New Position: (%d, %d)\n", p.x, p.y);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Users/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0220
1 2
3 4
New Position: (4, 6)
```

문제 C91-0230

추가문제 > C C91-0230.c > ...

```c
#include <stdio.h>

typedef struct {
    int width, height;
} Rectangle;

void resize(Rectangle* r) {
    r->width *= 2;
    r->height *= 2;
}

int main() {
    Rectangle r;
    scanf("%d %d", &r.width, &r.height);
    resize(&r);
    printf("Resized: %d x %d\n", r.width, r.height);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Ur
sers/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0230
3 5
Resized: 6 x 10
```

문제 C91-0240

추가문제 > C C91-0240.c > ...

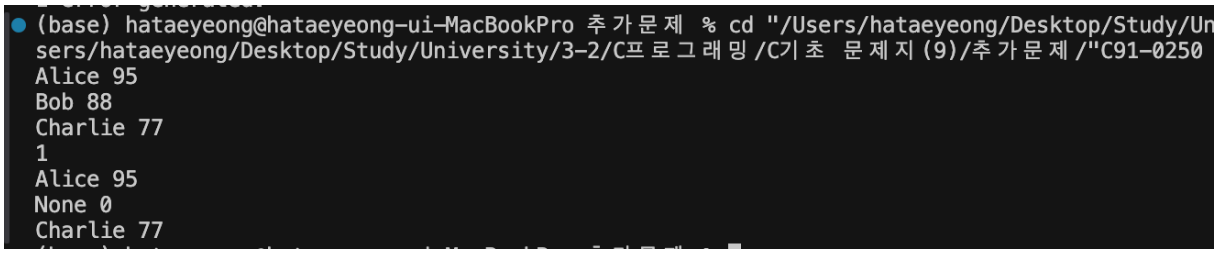
```c
#include <stdio.h>

typedef struct {
    char name[30];
    double price;
    int discount;
} Product;

void applyDiscount(Product* p) {
    p->price = p->price * (100 - p->discount) / 100.0;
}

int main() {
    Product p;
    scanf("%s %lf %d", p.name, &p.price, &p.discount);
    applyDiscount(&p);
    printf("%s: %.1f\n", p.name, p.price);
    return 0;
}
```

```
(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Un
sers/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0240
Laptop 1200000 25
Laptop: 900000.0
```

문제 C91-0250

추가문제 > C C91-0250.c > ...

```c
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <ctype.h>

#define MAX 100

typedef struct {
    char name[20];
    int score;
} Student;

void resetStudent(Student* s) {
    strcpy(s->name, "None");
    s->score = 0;
}
int main() {
    Student students[MAX];
    int count = 0;

    // 학생 정보 입력
    while (count < MAX) {
        char name[20];
        int score;
        if (scanf("%s", name) != 1) break;

        // 숫자가 오면 종료 (초기화 인덱스 입력으로 판단)
        if (name[0] >= '0' && name[0] <= '9') {
            int resetIndex = atoi(name);
            if (resetIndex >= 0 && resetIndex < count) {
                resetStudent(&students[resetIndex]);
            }
            break;
        }

        scanf("%d", &score);
        strcpy(students[count].name, name);
        students[count].score = score;
        count++;
    }

    // 전체 출력
    for (int i = 0; i < count; i++) {
        printf("%s %d\n", students[i].name, students[i].score);
    }

    return 0;
}
```


(base) hataeyeong@hataeyeong-ui-MacBookPro 추가문제 % cd "/Users/hataeyeong/Desktop/Study/Un
sers/hataeyeong/Desktop/Study/University/3-2/C프로그래밍/C기초 문제지(9)/추가문제/"C91-0250
Alice 95
Bob 88
Charlie 77
1
Alice 95
None 0
Charlie 77