

문항 선택

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10

11

12

검토 완료

강의실 홈

강의정보 ▲

강의계획서

성적/출석관리 ▲

온라인출석부

오프라인출석부

성적부

수강생 알림 ▲

쪽지 보내기

기타 관리 ▼

학습활동

기초컴퓨터프로그래밍

[Final-A:60]

시작 일시	2018-12-17, 20:16:13
진행 상황	종료됨
완료 일시	2018-12-17, 20:46:13
소요시간	30 분
성적	최고 60.00점 중 45.60점 (76%)

정보

The total exam time is **100 minutes (30min for A + 70min for B assumed)**.

- You should take the Final-A first.
  - During the Final-A, you cannot use any other program including the DEV-C++ except the PLMS browser itself.
- After finishing the Final-A, raise your hand to request the T.A for the password to start the Final-B. That is, you cannot start Final-B without finishing the Final-A.
  - You should use the DEV-C++ to solve the Final-B. Other programs are not allowed to use in default. But If it is necessary for you to use other IDEs or compiler programs, ask the T.A for permission.

The total points of the final exam is **150**.

The following table shows points assigned to each question.

**Final-A (Short Answer Questions - 60 points)**

Q #	1	2	3	4	5	6	7	8	9	10	11	12
pts	4	4	2	4	8	5	5	4	4	6	6	8

**Final-B (Essay(Programming) Questions - 90 points)**

Q #	1	2	3	4	5	6	7
pts	10	10	15	10	15	15	15

문제 1

틀림

총 4.00 점에서  
0.00 점 할당

We got the following warning and error messages for the following source code.

- main.c:15:29: warning: implicit declaration of function 'divide'
- main.c:19:8: error: conflicting types for 'divide'

Fill in the blank so that we can get rid of those warning and error.

```
#include <stdio.h>
#include <math.h>
int main(void)
{
    int a, b;
    scanf("%d%d", &a, &b);
    printf("a / b == %f\n", divide(a,b) );
    return 0;
}

float divide(int x, int y)
{
    return (float)x/y;
}
```

문제 2

정답

총 4.00 점에서  
4.00 점 할당

In terms of Scope, variables can be classified into two types.

- In the case of a variable declared in a function area, it is valid within the function and is called a local variable.
- If a variable is declared outside the function, it is valid in the entire function of the source file and is called a global variable.

Write the output of the following program.

Execution Result

s1= 6, s2= 3

```
#include <stdio.h>
int gSum=0;
int sum1(int n)
{
    gSum = gSum + n;
    return gSum;
}
int sum2(int n)
{
    int gSum = 0;
    gSum = gSum + n;
    return gSum;
}
int main(void)
{
    int n1=1,n2=2,n3=3;
    int s1, s2;

    s1 = sum1(n1); s1 = sum1(n2); s1 = sum1(n3);
    s2 = sum2(n1); s2 = sum2(n2); s2 = sum2(n3);

    printf("s1=%d,s2=%d\n",s1,s2);
    return 0;
}
```

plms.pusan.ac.kr/mod/quiz/review.php?attempt=254984

1/5

문제 3

정답

총 2.00 점에서  
2.00 점 할당

What is the output of the following program?

Execution Result

n>0 ? false ✓

un>0 ? true ✓

```
#include <stdio.h>

int main(void)
{
    int n = 0xFFFFFFFF;
    unsigned int un = 0xFFFFFFFF;

    printf("n>0 ? ");
    if (n>0)
        printf("true\n");
    else
        printf("false\n");

    printf("un>0 ? ");
    if (un>0)
        printf("true\n");
    else
        printf("false\n");

    return 0;
}
```

문제 4

부분적으로 맞음

총 4.00 점에서  
2.90 점 할당

- INT\_MAX is the maximum value of "int" type and UINT\_MAX is the maximum value of "unsigned int" type. INT\_MAX and UINT\_MAX are defined in "limits.h"
- What is the output of the source code below ?
- INT\_MAX --> "2147483647" in decimal. UINT\_MAX --> "4294967295" in decimal.
  - What is "INT\_MAX" in hexa ? What is "UINT\_MAX" in hexa ?  
Fill the blanks of the following execution result.

A palindromic number or numeral palindrome is a number that remains the same when its digits are reversed like 16461.

- What is the maximum palindromic number of "int" type ? 2147447412 ✓
  - must be less than 2147483647
  - Write in a decimal form.
- What is the maximum palindromic number of "unsigned int" type ? 4294664924 ✗
  - must be less than 4294967295
  - Write in a decimal form

Execution Result

sizeof(int) : 4, sizeof(unsigned int) : 4

[H E X A] 10 --> 0x0000000A, 15 --> 0x0000000F

[H E X A] max\_n : 0x 7ffffff ✓, max\_un : 0x fffffff ✓

[DECIMAL] max\_n : 2147483647, max\_un : 4294967295

```
#include <stdio.h>
#include <limits.h>
int main(void)
{
    int max_n = INT_MAX;
    unsigned int max_un = UINT_MAX;

    printf("sizeof(int) : %d, sizeof(unsigned int) : %d\n",
        sizeof(int),sizeof(unsigned int));

    printf("[H E X A] 10 --> 0x%08X, 15 --> 0x%08X\n", 10, 15);

    printf("[H E X A] max_n : 0x%08X, max_un : 0x%08X\n", max_n, max_un);
    printf("[DECIMAL] max_n : %d, max_un : %u\n", max_n, max_un);

    return 0;
}
```

문제 5

부분적으로 맞음

총 8.00 점에서  
6.00 점 할당

What is the output of the following program?

Execution Result

After foo1 : ax1[]={ 1 ✓, 2 ✓}, ay1[]={ 3 ✓, 4 ✓}

After foo2 : ax2[]={ 1 ✗, 2 ✓}, ay2[]={ 2 ✓, 4 ✓}

After foo3 : ax3[]={ 1 ✗, 2 ✗}, ay3[]={ 2 ✓, 3 ✓}

```
#include <stdio.h>
void foo1(int ax, int ay) {
    ay=++ax;
}

void foo2(int ax[1], int ay[1]) {
    ay[0] = ++ax[0];
}

void foo3(int ax[], int ay[], int n) {
    int i=0;
    while (i<n) {
        ay[i] = ++ax[i];
        i++;
    }
}

int main(void)
{
    int ax1[] = {1,2}, ay1[] = {3,4};
    int ax2[] = {1,2}, ay2[] = {3,4};
    int ax3[] = {1,2}, ay3[] = {3,4};

    foo1(ax1[0],ay1[0]);
    printf("After foo1 : ax1[]={%d,%d}, ay1[]={%d,%d}\n",
           ax1[0], ax1[1], ay1[0], ay1[1]);

    foo2(ax2,ay2);
    printf("After foo2 : ax2[]={%d,%d}, ay2[]={%d,%d}\n",
           ax2[0], ax2[1], ay2[0], ay2[1]);

    foo3(ax3,ay3,2);
    printf("After foo3 : ax3[]={%d,%d}, ay3[]={%d,%d}\n",
           ax3[0], ax3[1], ay3[0], ay3[1]);

    return 0;
}
```

문제 6

부분적으로 맞음

총 5.00 점에서  
3.50 점 할당

This problem consists of 2 sub-questions.

**SQ1)** We want to build a funtion named print\_2x2() in the source code below that prints out a 2x2 square matrix.

For each of the following codes for the function header, determine whether it raises a syntax error. Select "E" if it raise an error, otherwise select "X"

- void print\_2x2(double M[2][2]) E ✗
- void print\_2x2(double M[2][ ]) X ✗
- void print\_2x2(double M[][2]) E ✗
- void print\_2x2(double M[][] ) E ✓

```
#include <stdio.h>
void print_2x2( ... ) {
    printf("    [ %6.2f %6.2f ]\n",M[0][0],M[0][1]);
    printf("    [ %6.2f %6.2f ]\n",M[1][0],M[1][1]);
}

int main(void) {
    double M1[2][2] = { {1.7, 3.2}, {2.3, 4.1} };

    printf("Matrix M = \n");
    print_2x2(M1);
    return 0;
}
```

**SQ2)** We want to build a funtion named print\_nxn() in the source code below that prints out a nxn square matrix. "n" can be any positive integer.

For each of the following codes for the function header, determine whether it raises a syntax error. Select "E" if it raise an error, otherwise select "X"

- void print\_nxn(double M[n][n]) E ✓
- void print\_nxn(double M[n][ ]) E ✓
- void print\_nxn(double M[][n]) E ✓
- void print\_nxn(double M[][] ) E ✓
- void print\_nxn(double M[n][n], int n) E ✓
- void print\_nxn(int n, double M[n][n]) X ✓

```
#include <stdio.h>
void print_nxn( ... ) {
    int row, col;
    for (row=0; row<n; row++) {
        printf("    [ ");
        for (col=0; col<n; col++)
            printf("%6.2f ", M[row][col]);
        printf("]\n");
    }
}
```

문제 7

부분적으로 맞음

총 5.00 점에서  
4.00 점 할당

For each of following **pa** declarations for the source code below, determine whether it is a proper or not.

- int pa; 

X ▼ ✓
- int \*pa; 

O ▼ ✓
- int pa[]; 

O ▼ ✗
- int\* pa; 

O ▼ ✓
- int[] pa; 

X ▼ ✓

```
#include <stdio.h>
int main(void)
{
    int a = 10;
    [1]

    pa = &a;
    pa[0] += 5;
    printf("a == %d\n", a );
    return 0;
}
```

문제 8

정답

총 4.00 점에서  
4.00 점 할당

We want to print out the address and the value of **the 2nd element** of the int array **val1** in the source code below, as shown in the following execution result.

Choose a proper code for the blanks [1] and [2].

	[1] <div>1 ▼ ✓</div>	[2] <div>3 ▼ ✓</div>
1	p+1	p+1
2	p+2	p+2
3	*(p+1)	*(p+1)
4	*(p+2)	*(p+2)

Execution Result

The address of val[1] = 0062FE44  
The value of val[1] = 5

```
#include <stdio.h>
int main(void) {
    int val[2] = {3, 5};
    int *p = val;

    printf("The address of val[1] = %p\n", [1]);
    printf("The value of val[1] = %d\n", [2]);

    return 0;
}
```

문제 9

정답

총 4.00 점에서  
4.00 점 할당

Write the output of the following program.

Execution Result

2 ✓

```
#include <stdio.h>

typedef struct student {
    int id;
    char *pname;
    double points;
} STUD;

typedef struct student2 {
    int id;
    char name[20];
    double points;
} STUD2;

int main(void)
{
    STUD  s1 = {1, "BTS", 9.5};
    STUD2 s2 = {2, "BTS", 9.5};

    if (sizeof(s1) > sizeof(s2))
        printf("%d",1);
    else if (sizeof(s1) == sizeof(s2))
        printf("%d",0);
    else
        printf("%d",2);

    return 0;
}
```

문제 10

부분적으로 맞음

총 6.00 점에서  
2.00 점 할당

For each blue code line in the following source code, answer whether it raises a syntax error or not.

```
#include <stdio.h>
int main(void)
{
    struct stud {
        int    id;
        char   grade;
        double points;
    } s1 = {23, 'A', 97.2}, *ps1 = &s1;

    s1->id = 24;      // OK
    &s1->id = 24;     // Error
    (&s1)->id = 24;   // Error

    ps1.id = 24;      // OK
    *ps1.id = 24;     // Error
    (*ps1).id = 24;   // Error

    return 0;
}
```

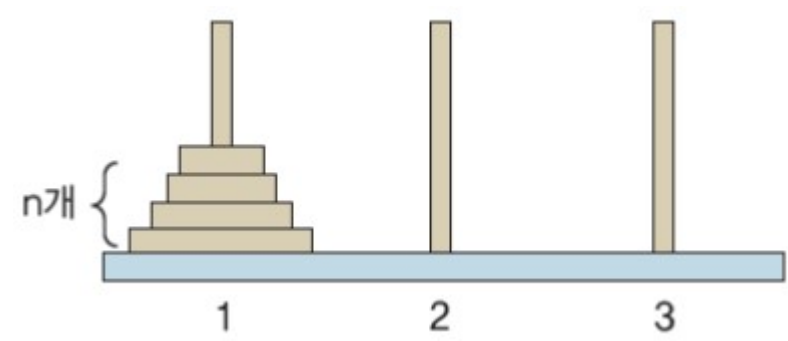
문제 11

정답

총 6.00 점에서  
6.00 점 할당

The Hanoi Tower is a mathematical game or puzzle. It consists of three rods and a number of disks of different sizes. The puzzle starts with the disks stacked in a rod in the ascending order of disk size as shown in the picture. We want to move the Tower of Hanoi, which consists of  $n$  discs in the first rod, to the third rod obeying the following simple rules.

- Only one disk can be moved at a time
- Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack or on an empty rod.
- No disk may be placed on top of a smaller disk.



- It is trivial that the number of minimum(optimal) number of disc movements when  $n=1$  is 1
- The number of minimum number of disc movements when  $n=2$  is 3.
- Write the number of minimum number of disc movements when  $n=3$  : 7
- Write the number of minimum number of disc movements when  $n=7$  : 127

Let  $D_n$  be the number of minimum number of disc movements for  $n$ . Find the relation between  $D_{n+1}$  and  $D_n$ .

- $D_{n+1} = 2 \cdot D_n + 1$

문제 12

부분적으로 맞음

총 8.00 점에서  
7.20 점 할당

[Game of Stone I-A]

Two players called Alice and Bob are playing a game with a number of stones.

**Alice always plays first**, and the two players move in alternating turns. The game's rules are as follows:

- In a single move, a player can remove either **2, 3, or 5** stones from the game board.
- If a player is unable to make a move because there are not enough stones, that player loses the game.

For example, Let the starting number of stone  $n = 4$ , can make the following moves:

- Alice removes 2 stones leaving 2, Bob will then remove 2 stones and win
- Alice removes 3 stones and leaving 1 stone. Bob cannot move and loses.

So, Alice would make the second play and win the game..

Assume that each player plays optimally, meaning they will not make a move that causes them to lose the game if a winning move exists.

Given the starting number of stones of  $n$ , Can you determine who will win?

For the following  $n$ s, determine the winner.

- $n = 1$  : Bob, A(1) = FALSE
- $n = 2$  : Alice, A(2) = TRUE
- $n = 3$  : Alice, A(3) = TRUE
- $n = 4$  : Alice, A(4) = TRUE
- $n = 5$  : Alice, A(5) = TRUE
- $n = 6$  : Alice
- $n = 7$  : Bob
- $n = 8$  : Bob
- $n = 12$  : Alice
- $n = 15$  : Alice

Let A(n) be a Boolean value that stands for whether Alice wins the game for the given  $n$ . Find the logical relation between A(n) and A(n-2), A(n-3) and A(n-5). ( $n > 5$ ) 4

- A(n) = A(n-2) OR A(n-3) OR A(n-5)
- A(n) = A(n-2) AND A(n-3) AND A(n-5)
- A(n) = NOT ( A(n-2) OR A(n-3) OR A(n-5))
- A(n) = NOT ( A(n-2) AND A(n-3) AND A(n-5))