

Computer Programming

Quiz2

June 10, 2022



Problem 1

- Write a function to find the area and perimeter of a rectangle. Write a program that uses this function to input the length and width of a rectangle, finds the area and perimeter, and prints it. Here's the function prototype. You get 0 points if you do not follow the given prototype when defining the function.

```
void get_rect(int width, int height, int *area, int *perimeter)
```

Problem 1

- **Program output**

```
[ohyong@newton Quiz2_s456]$ vi pr1.c
[ohyong@newton Quiz2_s456]$ gcc pr1.c -o pr1
[ohyong@newton Quiz2_s456]$ ./pr1
width? 100
height? 200

area: 20000, perimeter: 600
[ohyong@newton Quiz2_s456]$ ./pr1
width? 20
height? 10

area: 200, perimeter: 60
```

Problem 2

- A semester grade is calculated as 30 points for the midterm exam, 30 points for the final exam, 30 points for the team project, and 10 points for attendance. When there are 5 students, write a program that calculates the total score for each student, and outputs the average of the midterm exam, final exam, team project, attendance, and total score. Use the two-dimensional array that stores grades by initializing them as follows. Solve the problem using a *two dimensional* array. If you do not use a two-dimensional array, you get 0 points.

Problem 2

- Program output

```
[ohyong@newton Quiz2_s456]$ vi pr2.c
[ohyong@newton Quiz2_s456]$ gcc pr2.c -o pr2 -std=c99
[ohyong@newton Quiz2_s456]$ ./pr2
```

		mid	fin	team	att	tot
student	1:	28	28	26	9	91
student	2:	30	27	30	10	97
student	3:	25	26	24	8	83
student	4:	18	22	22	5	67
student	5:	24	25	30	10	89
average	:	25.0	25.6	26.4	8.4	85.4

Problem 3

- Write a function that doubles the size of an int array using *dynamic memory*. This function duplicates the elements of the original array by two and stores them in a new array, and returns the address of the new array. Make the function prototype like this. The main() function is given as follows.

```
void print_array(int *arr, int size)
int* duplicate_array(int *arr, int size)
```

```
int main(void)
{
    int x[5] = { 1, 3, 5, 7, 9 };
    // add source code

    return 0;
}
```

Problem 3

- **Program output**

```
[ohyong@newton Quiz2_s456]$ vi pr3.c  
[ohyong@newton Quiz2_s456]$ gcc pr3.c -o pr3  
[ohyong@newton Quiz2_s456]$ ./pr3  
x Array: [ 1 3 5 7 9 ]  
  
y Array: [ 1 1 3 3 5 5 7 7 9 9 ]
```

Submission

- **Submit to Newton server**

At the end of the Quiz2, submit your C source file by typing

```
~gs1401/bin/submit Quiz2_s456 pr1.c pr2.c pr3.c // due : 4:00 pm
```

You may check that you have submitted your source code correctly by typing

```
~gs1401/bin/submit -check
```