

2010.1 Final Exam : C Programming

Student Id. : (_____) , Name : (_____)

* You may use standard library function in your answers.

1. (10points) Implement **strcpy** function.

```
/* strcpy copies the C string pointed by src into the array pointed by des ,
   including the terminating null character */
```

```
void strcpy(char* des , char* src)
```

```
{
}

```

2. (15points) Fill out following blanks (1) ~ (5).

```
void swap( (1) _____ , (2) _____ )
```

```
{
(3)
// swap switches integer values of two parameter variables
}

```

```
#include <stdio.h>
int main()
{
    int x=3,y=1;
    swap( (4) _____ , (5) _____ );
    printf("x=%d,y=%d\n",x,y);
    return 0;
}

```

Output (Execution Result) :

x=1,y=3

3. (20points) Implement a function **ex** that takes a floating-point value **x** as a parameter and returns the approximate(근사) value of e^x by using the formula : $e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots + \frac{x^{10}}{10!}$.

You may use the functions `fact(n)` and `power(x,n)` in the implementation of the function **ex**.

```
float ex(float x)
```

```
{
}

```

```
int fact(int n)
{ // computes and returns n!
    if (n==1 || n==0) return 1;
    return n*fact(n-1);
}

float power(float x, int n)
{ // computes and returns x^n
    if (n==0) return 1;
    return x*power(x,n-1);
}

```

4. (30points) Write a program that gets an arbitrary number (less than 100) of positive float values until -1 is received from a keyboard and print the mean and the standard deviation of the positive float values. Please use following formula for computing the standard deviation :

$$s_N = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \bar{x})^2} \quad , \text{ where } s_N \text{ is standard deviation and } \bar{x} \text{ is mean.}$$

```
#include <stdio.h>
#include <math.h>
int main()
{
}

```

Input & Output
example:

> a.exe
1.5
2.3
4.7
-1
mean = 2.833333
std. dev = 1.359738

5. (10points) Fill out the blank in the following C code to make it correct.

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    int i;
    int* x;
    _____
    x[0]=5; x[1]=2; x[2]=7;
    for (i=0;i<3;i++) printf("x[%d]=%d\n",i,x[i]);
    return 0;
}

```

6. (15points) Consider following C code. Answer to the following questions in detail.

```
int x=3;
int *y; <----- (a)
y=&x; <----- (b)
*y=10; <----- (c)
printf("%d,%d\n",x,*y); <----- (d)

```

- (1) What is the meaning of * in (a)? ()
- (2) What is the meaning of * in (c)? ()
- (3) What is the meaning of & in (b)? ()
- (4) What is the output result of printf in (d) ? ()