C Language Final Exam   May 31, 2022

1. Explain what the two programs are doing.
Explain the results of printf in the main and functions (Func1, Func2)
Explain the difference between the two programs.

```
// swap1.c
#include<stdio.h>
void swap (int *x, int *y)  {
   int temp;
   printf("Func1  %d \n", x);
   temp= *x;
   *x= *y;
   *y= temp; }

int main ( )  {
  int i=7;
  int j=9;
  swap(&i, &j);
  printf("Swap1  %d %d  \n", i, j);
}
```

```
// swap2.c
#include<stdio.h>
void swap (int x, int y)  {
   int temp;
   printf("Func2  %d \n", x);
   temp= x;
   x=y;
   y=temp;}

int main ( )  {
  int i=7;
  int j=9;
  swap(i, j);
  printf("Swap2  %d %d  \n", i, j);
}
```

2. Explain the results of printf in the program.
Explain about empty spaces in the string fruit.
ASCII code:
 a= 97, p= 112, l= 108, e = 101, null (\0)= 0, space=32

```c
#include <stdio.h>
#include <string.h>
int main()  {
   char fruit[7]= "apple";
   printf ("%s \n", fruit);
   printf ("STRLEN= %d \n", strlen(fruit));
   printf ("SIZE=  %d \n", sizeof(fruit));

   int i;
   for (i=0; i<7; i++)
   {  printf ("Print1  %c \n", fruit[i]);  }

   for (i=0; i<7; i++)
   { printf ("Print2  %d \n", fruit[i]);  }
   return 0;
}
```

3. matrix C= AB,　matrix $A = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{matrix}$ 　matrix $B = \begin{matrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{matrix}$

Write a program to calculate matrix multiplication C= AB.

```
#include <stdio.h>
int main()  {
int i;
int C[2][2]= {0, 0, 0, 0};
int A[2][3]= {1, 2, 3, 4, 5, 6};
int B[3][2]= {1, 2, 3, 4, 5, 6};
```

Fill this part to calculate C[0][0] and C[0][1].
What are the values of C[0][0] and C[0][1]?

4.　Write a program: In the main, 3 integers x, y, z are declared. Send all of these data to a function. In the function, calculate a= x+y+z, return a to the main, and print it in the main.

5. Write output of this program, and explain the program.

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

typedef struct  {
    int x;
    int y;
}  Pt;

    int daa, dbb;
    Pt aa;
    aa.x= 3;
    aa.y= 4;

    printf(" %d   %d  \n", aa.x, aa.y);
    daa= aa.x*aa.x + aa.y*aa.y;
    printf(" daa=   %d \n", daa);

    Pt bb;
    bb.x=1;
    bb.y=2;

    printf(" %d   %d  \n", bb.x, bb.y);
    dbb= bb.x*bb.x + bb.y*bb.y;
    printf(" dbb=  %d \n", dbb);

    return 0;
}
```