Pointer in C

1. This is a C program input and output an array in ANSI C. This code is using static array.

```c
// ANSI C
#include <stdio.h>
void Output(int n,int* A);
void Input(int* n,int* A);
main()
{
    int A[100], n;
    Input(&n,A);
    Output(n,A);
}
void Input(int* n,int* A)
{
    int i;
    printf("Input n: ");
    scanf("%d",n);
    for (i=0;i<*n;i++)
    {
        printf("A[%d]: ",i);
        scanf("%d",&A[i]);
    }
}
void Output(int n,int* A)
{
    int i;
    printf("\n");
    for (i=0;i<n;i++)
        printf("%3d",A[i]);
}
```

Figure 1: Static Array

2. Student must be using dynamic array (array A) instead of static array

```
1    // VIET CHUONG TRINH BANG C CHUAN
2    #include <stdio.h>
3    #include <stdlib.h>
4    void Input(int* n,int* A);
5    void Output(int n,int* A);
6    main()
7    {
8        int* A, n;
9        Input(&n,A);
10       Output(n,A);
11   }
12   void Input(int* n,int* A)
13   {
14       int i;
15       printf("Input n: ");
16       scanf("%d",n);
17       A = (int*)calloc(*n,sizeof(int));
18       for (i=0;i<*n;i++)
19       {
20           printf("A[%d]: ",i);
21           scanf("%d",&A[i]);
22       }
23   }
24   void Output(int n,int* A)
25   {
26       int i;
27       printf("\n");
28       for (i=0;i<n;i++)
29           printf("%3d",A[i]);
30   }
31
```

But this is an error code

3. Student can resolve this problem by get input array by return of Input() function such as

```
#include <stdio.h>
#include <stdlib.h>
int* Input(int* n,int* A);
void Output(int n,int* A);
main()
{
    int* A, n;
    A = Input(&n,A);
    Output(n,A);
}
int* Input(int* n,int* A)
{
    int i;
    printf("Input n: ");
    scanf("%d",n);
    A = (int*)calloc(*n,sizeof(int));
    for (i=0;i<*n;i++)
    {
        printf("A[%d]: ",i);
        scanf("%d",&A[i]);
    }
    return A;
}
void Output(int n,int* A)
{
    int i;
    printf("\n");
    for (i=0;i<n;i++)
        printf("%3d",A[i]);
}
```

4. This is a problem of this assignment, student rewrite the program input/output an array by a pointer parameter in C language
5. Student must explain your code in a A4 paper.
   This is a sample pattern code

```c
#include <stdio.h>
#include <stdlib.h>
void Input(int* n,??? A);
void Output(int n,int* A);
main()
{
    int* A, n;
    A = Input(&n,??? A);
    Output(n,A);
}
int* Input(int* n,??? A)
{
    int i;
    printf("Input n: ");
    scanf("%d",n);
    ???? = (int*)calloc(*n,sizeof(int));
    for (i=0;i<*n;i++)
    {
        printf("A[%d]: ",i);
        scanf("%d",???);
    }
    return A;
}
void Output(int n,int* A)
{
    int i;
    printf("\n");
    for (i=0;i<n;i++)
        printf("%3d",A[i]);
}
```

Note:
- Template of upload file <StudentID>.pdf
- Upload one pdf file, a paper for code and paper for explanation.