**POINTERS IN C: Problems for Practice**

**1. *Predict the output of the following program. Then run the program and see if your expectation is matched:***

#include <stdio.h>

void swap1(int,int);

void swap2(int \*, int \*);

int main()

{

int a, b;

printf("Enter first number: ");

scanf("%d", &a);

printf("Enter second number: ");

scanf("%d", &b);

getchar();

printf("\nBefore swapping...\n\t a = %d, b = %d\n", a, b);

printf("Press <Enter> to continue...");

getchar();

swap1(a,b);

printf("\nAfter swapping using swap1()...\n\t a = %d, b = %d\n", a, b);

printf("Press <Enter> to continue...");

getchar();

swap2(&a, &b);

printf("\nAfter swapping using swap2()...\n\t a = %d, b = %d\n\n", a, b);

return 0;

}

void swap1(int a, int b)

{

int temp;

temp = a;

a = b;

b = temp;

return;

}

void swap2(int \*pa, int \*pb)

{

int temp;

temp = \*pa;

\*pa = \*pb;

\*pb = temp;

return;

}

**2. *Which of the following manipulations (done sequentially) is not legal in C? Explain why you think so.***

Consider the declarations: int \*p, arr[10] = { 10, 20, 30}, i = 10;

1. arr = arr + 1;
2. p = arr;
3. p = p + 1;
4. arr[2] = 20;
5. p[2] = 20;
6. arr = NULL;
7. p = NULL;
8. p = &arr[2];

**3. The function** findMax() ***finds out the largest integer in a given array and returns it to the calling function. Can you find out the mistakes in the following program written to accomplish this task?*** *(Write down the correct statements on the side, right next to the line of code.)*

1 int findMax(int &a, n)

2 {

3 int max, i;

4 max = a[0];

5 for (i = 1; i <= n; ++i)

6 if (a[i] > max) a[i] = max;

7 return a;

8 }

9

10 int main()

11 {

12 int N, i, mx;

13 printf("How many numbers? ");

13 scanf("%d", &N);

14 int arr[N]; /\* variable length array \*/

15 for (i = 0; i < N; ++i)

16 scanf("Enter number %d", arr[i]);

17 mx = findMax(arr[],&N);

18 printf("Largest number of the list is: %d\n", N, mx);

19 return 0;

20 }

**4. *Given a square matrix as input, what logic will you employ to find if it is: (write only the condition to be checked)***

1. a diagonal matrix
2. upper triangular matrix
3. lower triangular matrix