Week 7 assignment & solution

1. Which of the following statements are correct ?
    1) A string is a collection of characters terminated by '\0'.
    2) The format specifier %s is used to print a string.
    3) The length of the string can be obtained by strlen().
    4) A string is a collection of characters terminated by '\n'
        a) 1,2
        b) 1,2,3
        c) 2,3,4
        d) 1,3

Solution: (b)

2. The correct format to read sentence/sentences in C using scanf function is:

a) scanf(" %[^\n]s", sentence);
b) scanf("%s", &sentence);
c) scanf("%c",&sentence);
d) scanf("%[^\b]s", sentence);

Solution: (a)

3. In C, the placement of elements of a two dimensional array is
    a) Row wise
    b) Column wise
    c) Diagonal wise
    d) Bottom to top wise

Solution: (a) In C the placement of 2D array in memory is row wise.

4. strcat() function adds null character at the end.
    a) Only if there is space
    b) Always
    c) Depends on the standard
    d) Depends on the compiler

Solution: (b) Always

5. What will be the output of the C code.[The sizeoff operator returns the total number of bytes occupied by the variable/array/data type]

```
#include<stdio.h>
int main()
{
        char arr[] = "NPTEL-IITKGP";
        printf("%d", sizeof(arr));
        return 0;
}
```

Solution: size of arr[] is 13 as it is '\0' terminated

6. Maximum number of dimensions possible of an array in C is
   a) 100
   b) 1000
   c) 10000
   d) There is no limit.
   e) Theoretically there is no limit, practical limit is available memory size.

Solution (e) Theoretically there is no limit as such. However, the practical limit is available memory size.

7. The right method of initializing a 2D array is
   a) int abc[2][2] = {1, 2, 3 ,4 }
   b) int abc[][] = {1, 2, 3 ,4 }
   c) int abc[2][] = {1, 2, 3 ,4 }
   d) all of the above

Solution: (a) The valid initialization is option (a). Next two are invalid declaration because the second dimension must be specified.

8. What is the output of the following C code?

```
#include <stdio.h>
main()
{
   int ary[2][3];
   ary[][] = {{1, 2, 3}, {4, 5, 6}};
   printf("%d\n", ary[1][0]);
}
```

   a) 4
   b) 1
   c) 2
   d) Compile time error

Solution: (d) The initialization method of the array is not valid in C. The second dimension must be specified.

9. Find the output of the following C program.

```
#include <stdio.h>
main()
{
char a[10][8] = {"hi", "hello", "fellows"};
printf("%s", a[2]);
}
```

a[2] indicates the 3rd string of the 2D array. Thus “fellows” will be printed.

10. What will be the output?

```
#include <stdio.h>
   int main()
   {
      int a[2][3] = {1, 2, 3, 4, 5};
      int i = 0, j = 0;
      for (i = 0; i < 2; i++)
      for (j = 0; j < 3; j++)
      printf("%d ", a[i][j]);
      return 0;
   }
```

a) 1 2 3 4 5 0
b) 1 2 3 4 5 Garbage value
c) 1 2 3 4 5 5
d) Run time error

Solution: (a) 1 2 3 4 5 0

11. If the two strings are identical, then strcmp() function returns
    a) 1
    b) -1
    c) 0
    d) Any Nonzero values

Solution: (c) strcmp(const char *s1, const char*s2);
The strcmp return an int value that is

if s1 < s2 returns a value < 0

if s1 == s2 returns 0

if s1 > s2 returns a value > 0

12. If the starting address of an float array Arr[10][10] is 2000, what would be the memory address of the element Arr[5][6]? (float takes 4 bytes of memory)

Solution: If ‘a’, ‘b’ and ‘c’ denotes the starting address, number of columns and size in bytes for each element respectively of array Arr[][], then the location of Arr[i][j] can be calculated as

$$Address = a + (i * b + j) * c$$

Thus the address of Arr[5][6] is 2000+(5*10+6)*4=2224

13. Which of the following function is more appropriate for reading in a multi-word string?

    a) printf();

    b) scanf();

    c) gets();

    d) puts();

Solution: (c) gets(); collects a string of characters terminated by a new line from the standard input stream stdin

14. What will be the output?

```
#include<stdio.h>
#include<string.h>
int main()
{
   char str1[20] = "hello", str2[20] = " world";
   printf("%s", strcpy(str2, strcat(str1, str2)));
   return 0;
}
```

    a) hello
    b) world
    c) world hello
    d) hello world

Solution: (d) hello world.
str1=hello, str2=world.
After strcat(str1,str2), str1=hello world. And strcpy makes str2=hello world.

15. What will be the value of ‘i’ after the execution of the C code given below?

```
char str1[] = "dills";
char str2[20];
char str3[] = "daffo";
int i;
i = strcmp(strcat(str3, strcpy(str2, str1)), "daffodills");
```

Solution: strcat(str3, strcpy(str2, str1)) makes it “daffodills”, hence strcmp(“daffodills”, “daffodills”)=0