SM2-21st C Programming Language

Tutorial 1

6 Sep 2017

You are to provide the solution in LT-24.

1. Which of the following is a legal identifier:

```
this_OLD_maN
this:old:man
3OldMan
!OldOldMan
```

2. Write a program that converts your age in years to days. At this point, don't worry about fractional years and leap years.

3. Given the declarations and the `scanf` statement below:

```
int s1, s2, s3;
scanf ("%d%d%d", &s1,&s2,&s3);
```

If the input typed at the keyboard is

123

show the values of each of the variables after the `scanf`.

4. Until interrupted, the following code segment prints `TRUE FOREVER` on the screen repeatedly.

```
while (1)
{
    printf ("  TRUE FOREVER ");
    printf ("  \n ");
}
```

Write a simple code segment that uses a `for` loop to accomplish the same display.

5. Write a complete C program using a `while` loop to convert time in minutes to time in hours and minutes.

6. What is the screen output of the following code segment ?

```
int n=1234;
while (n>0)
{
  n = n/10;
  printf ("%5d\n",n);
}
```

7. Briefly explain the difference between data and information.

8. What will be printed on the screen after the following C program is executed?

```
# include <stdio.h>

void main()
{
     int x=10, y=20;

     x= y++;
     y= ++y + ++x;

     printf("x=%d  y=%d",x,y);
}
```

9. What is the numerical value of the following expression in C language?

!(5>4)

10. How many times will the following for loop execute?

```
# include <stdio.h>
void main ()
{
        int i, j;
        for (i=1;j=1;j++) printf("==>%d",j);
}
```

11. What will be printed on the screen after the following C program is executed?

```
# include <stdio.h>
int a=0;
void change (int a)
{
      a=a+1;
}

void main()
{
      int a=20;
      change (a);
      a=a+3;
      printf("a=%d",a);
}
```

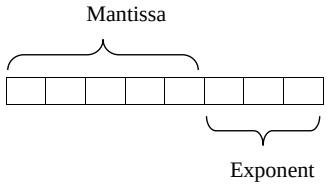
12. How many times will the following do loop execute?

```
# include <stdio.h>
void main()
{
      int k=0;
      do
      {
            k--;
            printf("%d",k);
            k=2*k;
      }
      while(k>=0);
}
```

13. What will be printed on the screen after the following C program is executed?

```
# include <stdio.h>
void main()
{
       int running=10,a=11;

       while(running)
       {
              if(a%2) printf ("cat");
              printf ("rat");
              running=0;
       }
 }
```

14. Represent -3.25 (10) by a floating-point notation with 5 mantissa bits and 3 exponent bits as follows.



15. A common seating arrangement in a theater is to label each row of seats by an alphabet, followed by a number increasing from the left seat to the right seat on the same row as shown.

			A1			
		B1	B2	B3		
	C1	C2	C3	C4	C5	
D1	D2	D3	D4	D5	D6	D7

Theater 1

The disadvantage of this numbering scheme is that it is difficult to determine the middle seat because the capacity of the theaters is different. E.g., the seat number D6 is the middle seat in Theater 2 but not in Theater 1.

		A1	A2	A3	A4	A5			
	B1	B2	B3	B4	B5	B6	B7		
C1	C2	C3	C4	C5	C6	C7	C8	C9	
D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11

Theater 2

Design a numbering scheme with the same set of alphabets and numbers to solve this problem so that the patrons are able to determine the middle seats when the floor plan of the theater is not available.

16. What does CPU stand for? Briefly write down two tasks of the CPU in a computer?

17. What will be printed on the screen after the following C program is executed?

```
# include <stdio.h>

void main()
{
    int x=10, y=20;

    x= ++y;
    y= y++ + x++;

    printf("x=%d  y=%d",x,y);
 }
```

18. What will be printed on the screen after the following C program is executed or the answer is unknown?

```
# include <stdio.h>
void main()
{
       char a;
       a='a'<'A';
       printf("%d",a);
}
```

19. How many times will the following for loop execute?

```
# include <stdio.h>

void main ()
{
         int i, j;
         for (i=0;j=0;j++) printf("==>%d",j);
}
```

20. What will be printed on the screen after the following C program is executed?

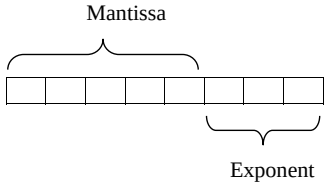
```
# include <stdio.h>

int a=0;

void change (int a)
{
       a=a+1;
}
void main()
{
       change (a);
       a+=3;
       printf("a=%d",a);
}
```

21. How many times will the following do loop execute?

```
# include <stdio.h>
void main()
{
	int k=0;
	do
	{
		k--;
		printf("%d", k++);
	}
	while(k>=0);
}
```

22. Explain why the real number 0 is not represented by the floating-point notation.

23. Represent -0.25 $_{(10)}$ by a floating-point notation with 5 mantissa bits and 3 exponent bits as follows.



24. The logical value of exclusive or (**xor**) is given in the following table:

xor	True	False
True	False	True
False	True	False

Let the integer 0 represent false, and any non-zero integers represent true.

Write a function named as **xor** with the following header:

int xor (int a, int b)

where a and b are the two input arguments for the xor function, and the function will give the result of the exclusive or for a and b.