printf, scanf, if-else

1. a. Write a program to show “Hello, I am a new programmer” on the screen.
b. Write a program to show your name on one line and address on another line.
c. Write a program to take an integer, a char and a float as input, and show the values entered on the monitor.

2. Write a program to calculate $\frac{a^3+2ac-2}{2bc-3}+\frac{2a}{b^2-a}+5a$

3. a. Given the HEIGHT and WIDTH of a rectangle, Compute its area.
b. Given the RADIUS of a circle, compute its area and circumference.
c. Given the HEIGHT and BASE of a triangle, compute its area.
d. Write a program to read a "float" representing a number of degrees Celsius, and print as a "float" the equivalent temperature in degrees Fahrenheit. Print your results in a form such as

100.0 degrees Celsius converts to 212.0 degrees Fahrenheit.

4. Given the height of a person in foot, convert the height in centimeter.

5. Write a program to SWAP the values of two integers.

6. Read an integer value. Assume it is the number of a month of the year; print out the name of that month.

7. Given as input three integers representing a date as day, month, year, print out the number day, month and year for the following day's date.
Typical input: 28 2 1992
Typical output: Date following 28:02:1992 is 29:02:1992

*** This problem requires a bit of thinking, Don’t get stuck here, solve the easy ones first. If you can not solve it yourself, get help from others.*

8. Write a program which reads two integer values. If the first is less than the second, print the message “up”. If the second is less than the first, print the message “down” If the numbers are equal, print the message “equal”.

9. Find the minimum numbers between 3 numbers.

10. Given 4 numbers, Find the sum of the HIGHEST 3 numbers.

11. Given a number, if the number is divisible by 3 or 7, print the message “The number is divisible by 3 or 7”, otherwise, print the message “The number is neither divisible by 3 nor by 7”.

12. Given a number, if the number is divisible by 2, print “The number is divisible by 2”, if the number is divisible by 5, print “The number is divisible by 5”, if the number is divisible by BOTH 2 and 5, print “The number is divisible by both numbers”, if the number is not divisible by any of the given numbers, print “Not divisible by 2 or 5”.

13. Write a program, which will take MARK as input and show grade as output.
Grading system:
80 or above A+
70 or above A
60 or above A-
Below 60 F

Loops (while, do-while, for)
Solve each problem using ALL types of loops.

14. Write a program to read in 10 numbers and compute the average, maximum and minimum values.

15. Write a program to print all even numbers from 13 to 999.

16. Write a program to print all the numbers which are either multiples of 3 or multiples of 7, but not multiples of both, between 21 to 1944.

17. a. Write a program to find Greatest Common Divisor of two integers.
    b. Write a program to reverse the digits of a given integer.
*** These problems require a bit of thinking, Don't get stuck here, solve the easy ones first. If you can not solve it yourself, get help from others.*

18. a. Write a program to find the Factorial of a given number.

19. Given two integers, A and B, find A to the power B.

20. Write a program to read in numbers until the number -999 is encountered. The sum of all number read until -999 should be printed out.

21. Write a program which will read an integer value for a base, then read a positive integer written to that base and print its value.

Input		Output	
10	1234	1234	
8	77	63	(the value of 77 in base 8, octal)
2	1111	15	(the value of 1111 in base 2, binary)

The base will be less than or equal to 10.

*** This problem requires a bit of thinking, Don't get stuck here, solve the easy ones first. If you can not solve it yourself, get help from others.*

22. Read in three values representing respectively
a capital sum (integer number of taka),
a rate of interest in percent (float),
and a number of years (integer).
Compute the values of the capital sum with compound interest added over the given period of years. Each year's interest is calculated as
interest = capital * interest_rate / 100;
and is added to the capital sum by
capital = capital + interest;
Print out money values as pounds (pence / 100.0) accurate to two decimal places.
Print out a floating value for the value with compound interest for each year up to the end of the period.
Print output year by year in a form such as:
Original sum 30000.00 at 12.5 percent for 20 years

Year	Interest	Sum
1	3750.00	33750.00
2	4218.75	37968.75
3	4746.09	42714.84
4	5339.35	48054.19
5	6006.77	54060.96
6	6757.62	60818.58
7	7602.32	68420.90
8	8552.61	76973.51
9	9621.68	86595.19
10	10824.39	97419.58

23. Read a positive integer value, and compute the following sequence: If the number is even, halve it; if it's odd, multiply by 3 and add 1. Repeat this process until the value is 1, printing out each value. Finally print out how many of these operations you performed.

Typical output might be:

```
Inital value is 9
 Next value is  28
 Next value is  14
 Next value is   7
 Next value is  22
 Next value is  11
 Next value is  34
 Next value is  17
 Next value is  52
 Next value is  26
 Next value is  13
 Next value is  40
 Next value is  20
 Next value is  10
 Next value is   5
 Next value is  16
 Next value is   8
 Next value is   4
 Next value is   2
 Final value 1, number of steps 19
```

23. Write a program to count the vowels and letters in free text given as standard input. Read text a character at a time until you encounter '!'.

Then print out the number of occurrences of each of the vowels a, e, i, o and u in the text, the total number of letters, and each of the vowels as an integer percentage of the letter total.

Suggested output format is:

```
Numbers of characters:
a   3 ; e   2 ; i   0 ; o   1 ; u   0 ; rest  17
Percentages of total:
a  13%; e   8%; i   0%; o   4%; u   0%; rest  73%
```

24. Given N, which will show output as follows:

N=1	N=3	N=5
*	*	*
	**	**
	***	***
	**	****
	*	***
		**
		*

25. Given N write a program to show the following output:

N=2	N=3	N=4
1	1	1
12	12	12
	123	123
		1234

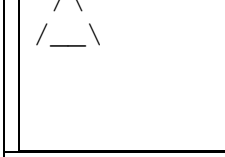
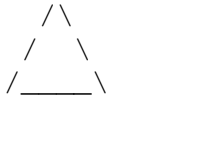
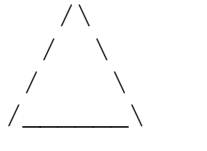
26. Given N write a program to show the following output:

N=2	N=3	N=4
21 1	321 21 1	4321 321 21 1

27. Given N, Write a program to show the following output:

N=1	N=2	N=3	N=4
#	## **	### *** ###	#### **** #### ****

28. Given N write a program to show the following output: assume N >1

N=2	N=3	N=4
		

29. Write a program to print all PRIME numbers from 13 to 20022.
(N is a prime iff it is divisible only by 1 and N itself).

26. Write the output of the following code:

```
int main()
{     int n=3,i,j;
      for(i=-1;i<2;i++)
      {
          for(j=2;j<=n;j=j+1)
printf("i=%d j=%d",i,j);
      printf("\n");
      }
}
```

30. Write the output of the following code:

```
int main()
{     int n=5,i,j;
      for(i=5;i>=3;i--)
      {
      j=1;
           while(j>-2)
           {
printf("i=%d j=%d",i,j);
                j=j-1;
           }
      printf("\n");
      }
}
```

31. Write the output of the following code:

```
int main()
{     int n=3,i,j;
      for(i=-2;i<1;i++)
      {
          for(j=n;j>=1;j=j-1)
printf("i=%d j=%d",i,j);
      printf("\n");
      }
}
```