(a) Write a program to print all prime numbers from 1 to 300. (Hint: Use nested loops, **break** and **continue**)

(b) Write a program to add first seven terms of the following series

$$\frac{1}{1!} + \frac{2}{2!} + \frac{3}{3!} + \ldots\ldots$$

using a **for** loop.

(c) Write a program to generate all combinations of 1, 2 and 3 using **for** loop.

(d) Write a program to print the multiplication table of the number entered by the user. The table should get displayed in the following form:

29 * 1 = 29
29 * 2 = 58
...

(e) According to a study, the approximate level of intelligence of a person can be calculated using the following formula:

$i = 2 + (y + 0.5 x)$

Write a program that will produce a table of values of **i**, **y** and **x**, where **y** varies from 1 to 6, and, for each value of **y**, **x** varies from 5.5 to 12.5 in steps of 0.5.

(f) When interest compounds **q** times per year at an annual rate of **r** % for **n** years, the principal **p** compounds to an amount **a** as per the following formula

$a = p (1 + r / q)^{nq}$

Write a program to read 10 sets of **p, r, n** & **q** and calculate the corresponding **a**s.

(g) The natural logarithm can be approximated by the following series.

$$\frac{x-1}{x}+\frac{1}{2}\left(\frac{x-1}{x}\right)^2+\frac{1}{2}\left(\frac{x-1}{x}\right)^3+\frac{1}{2}\left(\frac{x-1}{x}\right)^4+....$$

If **x** is input through the keyboard, write a program to calculate the sum of first seven terms of this series.

(h) Write a program to generate all Pythagorean Triplets with side length less than or equal to 30.

(i) Population of a town today is 100000. The population has increased steadily at the rate of 10 % per year for last 10 years. Write a program to determine the population at the end of each year in the last decade.

(j) Ramanujan number is the smallest number that can be expressed as sum of two cubes in two different ways. Write a program to print all such numbers up to a reasonable limit.

(k) Write a program to print 24 hours of day with suitable suffixes like AM, PM, Noon and Midnight.

(l) Write a program to produce the following output:

```
                1
            2       3
        4       5       6
    7       8       9       10
```