Objective:

- To get a grip on problem solving involving repetition structure and a couple of exercises to practice dry run.

Devise Solution of the following problems using Pseudo Code

1. Test/run the following pseudo code. If it contains any grammar/syntax error then mention that error otherwise give output on screen and variable status in RAM. Assume that user input oa = 624

```
1- Declare oa, r, da, exp
2- exp = 1
3- Print "Enter number : "
4- Input oa
5- da = 0
6- Repeat until ( oa >= 1 )
        6.1- r = oa % 10
        6.2- oa = oa / 10
        6.3- da = da + r * exp
        6.4- exp = exp * 8
7- exp = r
8- r = oa
9- oa = exp
10- Print "Number : ", da
```

RAM															
oa															
r															
da															
exp															
Console															

2. What output does this program produce? Please pay attention to all of the print statements.

```
1- Declare m, n, upperBound
2- m = 24
3- n = 30
4- upperBound = n
5- If ( m <= n )
     5.1- upperBound = m
6- Print upperBound
7- Declare factor, maxFactor
8- factor = 2
9- maxFactor = 1
10- Repeat Until (factor <= upperBound)
     10.1- If (m % factor == 0 AND n % factor == 0)
              10.1.1- maxFactor = factor
              10.1.2- print maxFactor
     10.2- factor = factor + 1
```

RAM														
m														
n														
upperBound														
factor														
maxFactor														
Console														

3. Input 'N' numbers from user and sum up only those numbers, which are odd. Also display the count of odd numbers entered.

4. Input N numbers from user and find the largest value entered by user.

5. Input a number N and display all the positive divisors of N.

6. Calculate the factorial of a positive integer entered by user.

7. The kingdom of ABRACADABRA, where the unit of currency is abra, has the following income tax code:

First 5,000 abra: 0% tax
Next 10,000 abra: 10% tax
Next 20,000 abra: 15% tax
Abras after 35,000: 20% tax

For example, someone earning 38,000 abra would owe:

5,000 * 0.00 + 10,000 * 0.10 + 20,000 * 0.15 + 3,000 * 0.20 = 4600 abras

Write a pseudo code that ask user about his income and report the tax that he has to pay.

8. Input two numbers 'a' and 'n' from user. And calculate a^n.

9. Write a pseudo code to enter any number and calculate product of its digits.

10. Input a number and find whether the number is prime or not.

11. Assuming the ocean's level is currently rising at about 1.5 millimeters per year; write a pseudo code that displays a table showing the number of millimeters that the ocean will have risen each year for the next 25 years.

12. Input a base-10 number and display its equivalent octal number.

13. The Last Stop Boutique is having a five-day sale. Each day, starting on Monday, the price will drop 10% of the previous day's price. For example, if the original price of a product is $20.00, the sale price on Monday would be $18.00 (10% less than the original price). On Tuesday the sale price would be $16.20 (10% less than Monday). On Wednesday the sale price would be $14.58; on Thursday the sale price would be $13.12; and on Friday the sale price would be $11.81. Develop a solution that will calculate the price of an item for each of the five days, given the original price.

14. Calculate the Grade Point Average (GPA) for a semester.

GPA for a semester is calculated by:

a. Multiplying grade points with the credit hours in each course to obtain total grade points
b. Add up the total grade points to cumulative Grade Points and divide by the total number of credit hours in order to calculate the GPA for a semester.

For Example:

Subject	**Marks**	**Cr. Hrs.**	**Grade Point**	
ITC	70	3	3	(3*3+3*4+4*3.7+1*2.6)/11= 39.4/11 = 3.49 **GPA**
PF	87	3	4	
EMT	83	4	3.7	
PF Lab	66	1	2.6	

Ask the user about the number of subjects he studied in the semester and then ask for the marks in these subjects and their credit hours in order to calculate GPA.

15. Write a program, which takes input of two integers. It then displays the greatest common devisor of the two entered integers.