WIX1002 Fundamentals of Programming
Semester 1 2015/2016
Lab 4: Flow of Control (Repetition)

1. Write a program that accepts an integer from user. Then, display its entire factors in increasing order.

```
Enter an Integer: 24
The factors are: 1, 2, 3, 4, 6, 8, 12, 24
```

2. Write a program that generates the first n prime number. n is an random integer within 0 to 100.

3. Write a program that calculates the minimum, maximum, average and standard deviation (s) of the exam score in a subject. The program will accepts the score and quit if negative score is enter. A sample output is given below.

$$s = \sqrt{\frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N-1}}$$

```
Enter a score [negative score to quit]:75
Enter a score [negative score to quit]:34
Enter a score [negative score to quit]:58
Enter a score [negative score to quit]:12
Enter a score [negative score to quit]:96
Enter a score [negative score to quit]:-1
1095.0
Minimum Score: 12
Maximum Score: 96
Average Score: 55.00
Standard Deviation: 33.09
```

4. Write a simple two players dice game. Each player will take turns to roll a dice. The first player that reach more than 100 points win the game. If the player rolls a 6, the player will score 6 points and has the chance to roll again.

5. Write a program that generates a non-negative random integer. Display the number of digits in the integer.

6. Write a program that used to calculate mortgage loan. The program will create the amortization table with equal total payment plan. The following are the formula and the sample output.

$$M = \left(P * \frac{i}{12*100}\right) / \left(1 - \left(1 + \frac{i}{12*100}\right)^{-N}\right)$$

M = Monthly payment
P = Principal
i = yearly interest rate in %
N = total number of months

$$C_n = M * \left(1 + \frac{i}{12*100}\right)^{-(1+N-n)}$$

$$L_n = M - C_n$$

$$R_n = L_n / \frac{i}{12*100} - C_n$$

C = Principal portion due
n = month under consideration
L = interest due
R = remaining principal balance due

```
Enter principal amount: 10000
Enter interest in %: 4
Enter total number of month(s): 12
```

Month	Monthly Payment	Principal	Interest	Unpaid Balance	Total Interest
1	851.50	818.17	33.33	9181.83	33.33
2	851.50	820.89	30.61	8360.94	63.94
3	851.50	823.63	27.87	7537.31	91.81
4	851.50	826.37	25.12	6710.94	116.93
5	851.50	829.13	22.37	5881.81	139.30
6	851.50	831.89	19.61	5049.92	158.91
7	851.50	834.67	16.83	4215.25	175.74
8	851.50	837.45	14.05	3377.80	189.79
9	851.50	840.24	11.26	2537.56	201.05
10	851.50	843.04	8.46	1694.52	209.51
11	851.50	845.85	5.65	848.67	215.16
12	851.50	848.67	2.83	0.00	217.99