Assignment 1 Report

Question 1
1. This code is saved in q1.py
2. This program allows the user to input the final account value, annual interest rate (the unit is %) and the number of years.
   These numbers should be positive real numbers.
   The output would be the initial value of money that has to be saved to obtain the final account value.
3. Execute as followings:

```
Enter the final account value:10000
Enter the annual interest rate:2.3
Enter the number of years:5
The initial value is: 8925.279628922432
```

Question 2
1. This code is saved in q2.py
2. This program allows the user to enter an integer
   The number should be a positive integer.
   The output should be each of its digits one by one.
3. Execute as followings:

```
Enter a integer:3125
3
1
2
5
```

Question 3
1. This code is saved in q3.py
2. This program allows the user to input a number m.
   The number m should be nonnegative
   The output n should be the smallest integer such that n^2 is greater than m.
3. Execute as followings:

```
Enter a number:10
4
```

Question 4
1. The code is saved in q4.py
2. This program allows the user to input a positive integer and will output a table which shows every positive integer m that is smaller or equal to the number and the value of m+1 and m^{m+1}.
   If the user fails to input a qualified number, the user will receive and be asked to

input again until the qualified number appears.
3. Execute as followings:

```
Enter a number:8
m       m+1     m**(m+1)
1       2       1
2       3       8
3       4       81
4       5       1024
5       6       15625
6       7       279936
7       8       5764801
8       9       134217728
```

Question 5

1. This code is saved in q5.py
2. This program allows the user to input an integer N and print all the prime numbers which are smaller than N.
   If the user fails to input a qualified number, for example input a string or a number less than 1, the user will receive a reminder and be asked to input again until the qualified number appears.
3. Execute as followings:

```
Enter an integer:100
2  3  5  7  11  13  17  19
23  29  31  37  41  43  47  53
59  61  67  71  73  79  83  89
97
```

Question 6

1. This code is saved in q6.py
2. This program allows the user to specify a trigonometric function f, and input the interval end points a, b and number of sub-intervals n. Then it can calculate the numerical integration of f over [a, b].
   If the user fails to input a qualified number, for example input a floating number as n or the user input a wrong function name, the user will receive a reminder and be asked to input again until the qualified number appears.
3. Execute as followings:

```
Enter a trigonometric function name:sin
Please enter the left endpoint a:0
Please enter the right endpoint b:1
Please enter the number of sub-intervals:100
The result is: 0.45969960954450584
```