

1246 計算機概論與程式設計

2019/10/14 Lab 5

Lab 5

Question 1 (20%)

質因數分解

請完成一個質因數分解程式。程式讀取輸入後，輸出質因數分解的結果。注意有可能會有例外輸入，務必處理。程式可重複輸入，直到輸入0後結束。

輸出範例： $60=2^2 * 3 * 5$ ，質因子依**升幂排列**

測資範圍：輸入 $[2, 10000]$

Question 1 Sample Output

```
Input: 60
```

```
60 = 2^2 * 3 * 5
```

```
Input: 1001
```

```
1001 = 7 * 11 * 13
```

```
Input: 10110
```

```
Out of range.
```

```
Input: 0
```

```
Process returned 0 (0x0)   execution time : 15.715 s
```

```
Press any key to continue.
```

Question 2 (30%)

do-while練習

讀取輸入 k 後，找出**最小的 n** 滿足 $1+2+\dots+n \geq k$ 。務必使用do-while實現。

測資範圍： k 範圍 $[1, 2^{31}-1]$

Question 2 Sample Output

```
k = 100  
n = 14
```

```
Process returned 0 (0x0)   execution time : 4.858 s  
Press any key to continue.
```

Question 3 (30%)

泡沫排序

請實作泡沫排序(bubble sort)程式。輸入為20個整數，讀取後輸出排序結果。請**務必實現該排序方法**否則以零分計算。

測資範圍：整數 $[-2^{31}, 2^{31}-1]$

Question 3 Sample Output

```
Input: 9 5 8 7 11 3 6 -32 50 77 10 14 12 16 2 33 125 1 -5 -20  
Output: -32 -20 -5 1 2 3 5 6 7 8 9 10 11 12 14 16 33 50 77 125  
  
Process returned 0 (0x0)   execution time : 7.852 s  
Press any key to continue.
```


Question 4 (20%)

讀檔練習

實作一個程式，輸入檔案名稱並讀取指定檔案，列印其內容並正確地結束程式。讀取的檔案為.txt檔，內容為一小段文章。

Question 4 Sample Output

```
Enter your filename: test.txt
```

```
This is test.txt.  
Hello everyone.
```

```
Process returned 0 (0x0)   execution time : 3.397 s  
Press any key to continue.
```

