

## 1111 物件導向設計與實習(資訊二合)[3670/3671]期中考試答案卷

Please rename this file to *Mexam\_StudentID.docx* and convert this file to *.pdf* format and [submit the Mexam\\_StudentID.pdf file to iLearn2](#). Midterm exam has four programming questions, please follow the instructions in each question and submit the specified file(s) to iLearn2.

### 考試答案

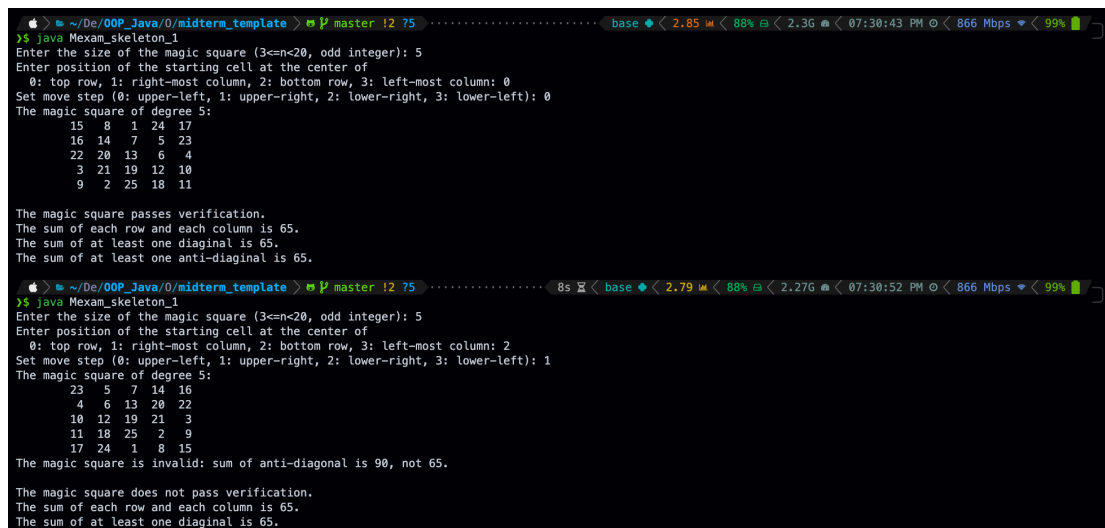
#### 1. Magic Square – Flip and Turn

**[30%+4%]** (計分標準：依正確性與完整度給分6%~30%，完成所有對角線加總驗證者加碼4%)

##### ■ 簡要解題方法說明(120字以內)

本題是將原本單純的Magic Square改成可以自訂起始位置以及擺放位置，因此我先做基本的輸入後，我設了兩個變數r\_offset以及c\_offset去做方向控制，接著再去確認斜線、反斜線、每一行、每一列是否等於total。

##### ■ 產出結果檔名或截圖[程式輸出入資料畫面]



```

$ java Mexam_skeleton_1
Enter the size of the magic square (3<=n<20, odd integer): 5
Enter position of the starting cell at the center of
0: top row, 1: right-most column, 2: bottom row, 3: left-most column: 0
Set move step (0: upper-left, 1: upper-right, 2: lower-right, 3: lower-left): 0
The magic square of degree 5:
15 8 1 24 17
16 14 7 5 23
22 20 13 6 4
3 21 19 12 10
9 2 25 18 11

The magic square passes verification.
The sum of each row and each column is 65.
The sum of at least one diagonal is 65.
The sum of at least one anti-diagonal is 65.

$ java Mexam_skeleton_1
Enter the size of the magic square (3<=n<20, odd integer): 5
Enter position of the starting cell at the center of
0: top row, 1: right-most column, 2: bottom row, 3: left-most column: 2
Set move step (0: upper-left, 1: upper-right, 2: lower-right, 3: lower-left): 1
The magic square of degree 5:
23 5 7 14 16
4 6 13 20 22
10 12 19 21 3
11 18 25 2 9
17 24 1 8 15

The magic square is invalid: sum of anti-diagonal is 90, not 65.

The magic square does not pass verification.
The sum of each row and each column is 65.
The sum of at least one diagonal is 65.
```

此圖為執行題目上的側資，所產生的測試結果。

##### ■ 程式附件檔名或所有程式碼貼圖

煩請老師與助教參閱 Mexam\_skeleton\_1.java，謝謝

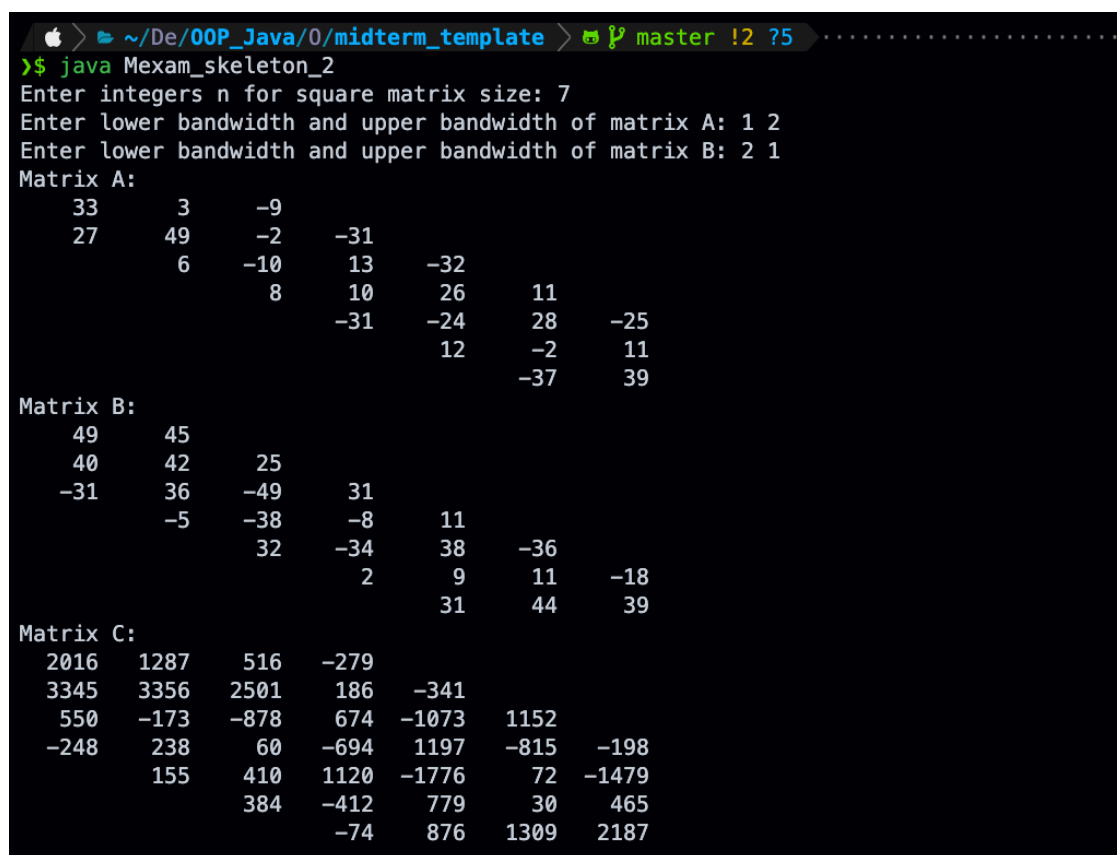
## 2. Banded Matrix

**[20%+4%]** (計分標準：依答案完整度與正確性給分4%~20%，矩陣類別封裝者至多加碼4%)

- 簡要解題方法說明(120字以內)

經由基本的輸入後，先將A, B, C三著陣列都先初始化，將每個設為0，接著在各自A, B陣列的r, s範圍內產生隨機值並存入陣列裡，然後再進行相乘，最後再進行輸出，並且在輸出上做了一些更改，若值為0，則印出空白，並且在輸出格式上做排版。

- 產出結果檔名或截圖[程式輸出入資料畫面]



```
Apple > ~/De/OOP_Java/0/midterm_template > master !2 ?5
>$ java Mexam_skeleton_2
Enter integers n for square matrix size: 7
Enter lower bandwidth and upper bandwidth of matrix A: 1 2
Enter lower bandwidth and upper bandwidth of matrix B: 2 1
Matrix A:
  33      3      -9
  27     49     -2    -31
           6    -10     13    -32
                8     10     26     11
                    -31    -24     28    -25
                        12     -2     11
                               -37     39
Matrix B:
  49     45
  40     42     25
 -31     36    -49     31
        -5    -38     -8     11
            32    -34     38    -36
                2      9     11    -18
                    31     44     39
Matrix C:
 2016  1287   516  -279
 3345  3356  2501   186  -341
  550  -173  -878   674  -1073  1152
 -248   238    60  -694  1197  -815  -198
        155   410  1120  -1776   72  -1479
            384  -412   779    30   465
                -74   876  1309  2187
```

- 程式附件檔名或所有程式碼貼圖

煩請老師與助教參閱 Mexam\_skeleton\_2.java ，謝謝

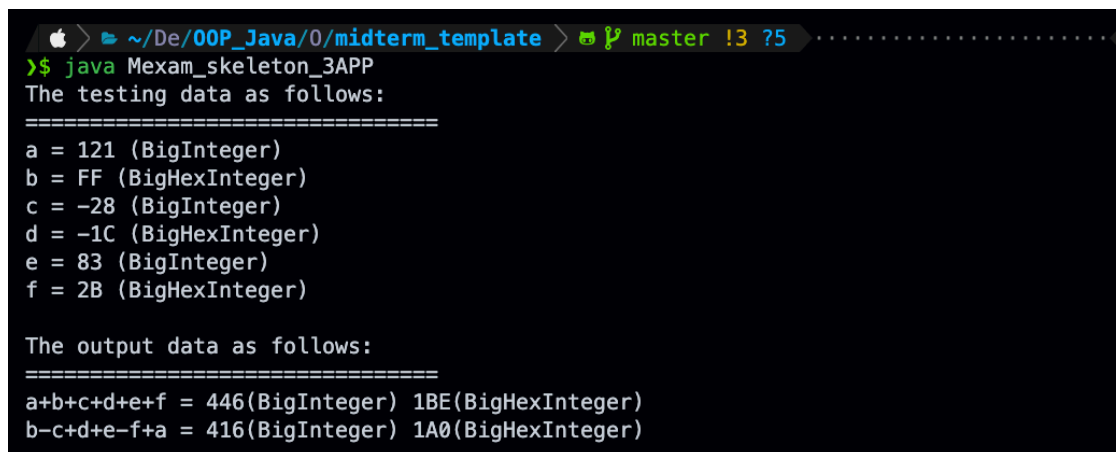
### 3. BigInteger Class

**[30%+12%]** (計分標準：依正確性與完整度給分6%~30%，完成乘除法與運算頗析至多加碼12%)

- 簡要解題方法說明(120字以內)

一開始先將Mexam\_skeleton\_3Class.java裡將原本的BigInteger做extends，接著constructor與加法寫好，而這裡我用到了overloading，以及overriding，最後再寫個APP，一開始先將初始值設好，接著再做減法與加法，最後再做一次性的輸出。

- 產出結果檔名或截圖[程式輸出入資料畫面]



```
Apple > ~/De/OOP_Java/0/midterm_template > master !3 ?5 .....
>$ java Mexam_skeleton_3APP
The testing data as follows:
=====
a = 121 (BigInteger)
b = FF (BigInteger)
c = -28 (BigInteger)
d = -1C (BigInteger)
e = 83 (BigInteger)
f = 2B (BigInteger)

The output data as follows:
=====
a+b+c+d+e+f = 446(BigInteger) 1BE(BigInteger)
b-c+d+e-f+a = 416(BigInteger) 1A0(BigInteger)
```

- 程式附件檔名或所有程式碼貼圖

煩請老師與助教參閱 Mexam\_skeleton\_3Class.java ，謝謝


煩請老師與助教參閱 Mexam\_skeleton\_3APP.java ，謝謝

#### 4. Triathlon

[20%] (計分標準：依正確性與完整度給分4%~20%)

- 簡要解題方法說明(120字以內)  
一開始先在class中設立多個attribute，存入個個的比賽時間以及序號和名字，並且implement一個compareTo，設定排序的規則，進行排序，接著再用一個回圈去設定各個選手的排名，最後再接答案一次輸出，並且做排版。

- 產出結果檔名或截圖[程式輸出入資料畫面]



```
> ~/De/OOP_Java/0/midterm_template > master !4 76 ..... base 4.12 88% 1.99G 08:19:02 PM 866 Mbps 100%
>$ java Mexam_skeleton_4APP
Rank  Serial No.   Name      Swimming      Biking      Running      Total Time
=====
1      102    Ben Tsai   00:17:42      00:58:33    00:39:21     01:55:36
2      104    Charles Lin 00:18:24      00:59:11    00:42:41     02:00:16
3      106    Bruce Chang 00:20:08      00:58:52    00:47:06     02:06:06
4      101    Luka Chen  00:23:17      01:02:42    00:48:36     02:14:35
4      105    Jerry Wang  00:21:16      01:00:49    00:52:30     02:14:35
6      103    Eric Huang  00:24:33      01:06:18    00:56:12     02:27:03
```

- 程式附件檔名或所有程式碼貼圖  
煩請老師與助教參閱 Mexam\_skeleton\_4Class.java ，謝謝  
煩請老師與助教參閱 Mexam\_skeleton\_4APP.java ，謝謝

-- The End --