

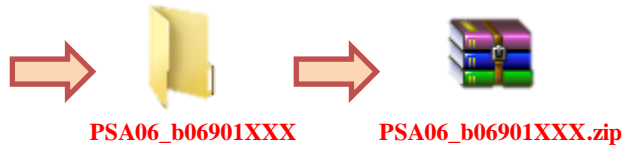
Programming Session Assignment 06

2017/11/06 by TA 陳泓弦

REQUIRED FILES

Please **compress a folder** named **PSA06_b06901XXX** (student ID) that contains the following files:

- ✓ b06901XXX_p1.cpp
- ✓ b06901XXX_p2.cpp
- ✓ b06901XXX_p3.cpp



Do not submit executable files (.exe). Files with names in wrong format will not be graded. In your .cpp files, we suggest you write comments in details as much as you can. It will be good for TAs to read your code and for your future reference and maintenance. (Due date: 11/08 06:00)

PROBLEM DESCRIPTION

1. [Required file: **b06901XXX_p1.cpp**]

There are some bugs in the file "PSA06_P1.cpp. Try to fix them until there is no error or warning. Make the output work like the following example.

Note that in this problem, we will input an integer number as array size (≥ 2), and then print out the following information:

- (1) the address of aPtr
- (2) the second element in array
- (3) the last element in array
- (4) each element in array

Example: (5 lines, 1 input line and 4 output lines)

```
Please enter array size : 8
The address of aPtr is: 0x7fb4bbd00000
The second element is: 1
The last is: 7
The values of array: 0 1 2 3 4 5 6 7
```

2. [Required file: **b06901XXX_p2.cpp**]

Please design a program to do the matrix calculation $C = A \times B$. You can input the size and the elements of matrices A_{mi} and B_{in} in the order of left-to-right, up-to-down in the matrix. If A and B can **not** do the matrix multiplication, output "Wrong size!" and end the program. Otherwise, output the matrix C_{mn} in the format of m rows and n columns.

Formula:

$$A_{mi} = \begin{bmatrix} A_{11} & \cdots & A_{1i} \\ \vdots & \ddots & \vdots \\ A_{m1} & \cdots & A_{mi} \end{bmatrix}_{m \times i}, B_{in} = \begin{bmatrix} B_{11} & \cdots & B_{1n} \\ \vdots & \ddots & \vdots \\ B_{i1} & \cdots & B_{in} \end{bmatrix}_{i \times n}$$

$$C_{mn} = A_{mi} \times B_{in} = \begin{bmatrix} C_{11} & \cdots & C_{1n} \\ \vdots & \ddots & \vdots \\ C_{m1} & \cdots & C_{mn} \end{bmatrix}_{m \times n}, C_{ij} = \sum_{k=1}^i A_{ik} \times B_{kj}$$

Example:

Correct case: (4 input lines and m output lines)

```
Please input size of matrix A: 2 3
Please input 6 elemnets of matrix A: 1 2 3 4 5 6
Please input size of matrix B: 3 3
Please input 9 elemnets of matrix B: 1 2 3 4 5 6 7 8 9
30 36 42
66 81 96
```

In this example

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}_{2 \times 3}, B = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}_{3 \times 3}, C = \begin{bmatrix} 30 & 36 & 42 \\ 66 & 81 & 96 \end{bmatrix}_{2 \times 3}$$

Wrong case: (5 lines, 4 input lines and 1 output)

```
Please input size of matrix A: 2 3
Please input 6 elemnets of matrix A: 1 2 3 4 5 6
Please input size of matrix B: 2 2
Please input 4 elemnets of matrix B: 4 5 6 7
Wrong size!
```

3. [Required file: **b06901XXX_p3.cpp**]

Please combine two unequal-length vectors to one vector using dynamic memory management. You will input the length and elements of two vectors and output the combined vector as the following example.

Example: (5 lines, 4 input lines and 1 output line)

```
Please input the first vector length: 3
Please input the second vector length: 4
Please input elements of first vector (3 elements) :1 2 34
Please input elements of second vector (4 elements) :5 48 32 44
[ 1 2 34 ] + [ 5 48 32 44 ] = [ 1 2 34 5 48 32 44 ]
```