	Format 類型	**# Questions 題目數**	**Total Marks 佔分**
Section A1 甲部 (一)	True or False 真假題	5	5
Section A2 甲部 (二)	Multiple Choice 多項選擇題	20	20
Section B 乙部	Fill-in-the-blanks 填充題	7 (A - L)	20
Total 總分			**45**

(1) Assume that the size of the `int` data type is 32 bits.
假設 `int` 資料類型的長度為 32 位元。

(2) The following code is added to the beginning of all C++ programs.
在所有 C++ 程序的頂部加入以下程式碼:

C++

```
#include <algorithm>
#include <array>
#include <cmath>
#include <cstdlib>
#include <deque>
#include <forward_list>
#include <iostream>
#include <list>
#include <queue>
#include <stack>
#include <string>
#include <utility>
#include <vector>
using namespace std;
```

(3) Assume all programs shall be compiled and executed in Ubuntu 20.04 using the compilers and commands below.
假設所有程序都將在 Ubuntu 20.04 下使用以下編譯器及指令進行編譯，然後執行。

GNU G++ (`g++-11` 11.1.0-1)

```
g++ -std=c++20 program.cpp -o program
./program
```

Section A1 甲部 (一) (5 marks 分)

For each question, determine whether the statement is true or false, then mark the corresponding box (T: true or F: false) on the answer sheet. One mark for each correct answer. No marks will be deducted for wrong answers.
請判斷下列每題的陳述句的真假，然後把答題紙對應的空格 (T: 真或 F: 假) 填滿。答對得一分，答錯不扣分。

1. In C++, when comparing two variables of different data types, a compilation error must occur.
在 C++，當比較兩個不同數據類型的變量時，編譯錯誤必定出現。

2. The following program always outputs `YES` when the input is an integer between -10^9 and 10^9 inclusive:
當輸入是介於 -10^9 和 10^9 之間 (含) 的整數時，以下程序必定輸出 `YES`：

C++

```
int main() {
  int x;
  cin >> x;
  if ((x + 11) % 3 == (x % 3 + 2) % 3)
    cout << "YES";
}
```

3. For all non-negative integers x and y, there always exists a non-negative integer z such that x `XOR` $z = y$.
對於所有非負整數 x 和 y，必定存在非負整數 z 使得 x `XOR` $z = y$ 。

4. Assume birthdays are independent and random with uniform distribution. Then in a regular year, the probability of at least two people having the same birthday in a group of 50 people is greater than 50%.
假設生日都是獨立且隨機均勻分佈的。那麼在平年裡，一群 50 人的群組中，存在至少有兩個人生日日期相同的概率大於 50%。

5. For every integer $N > 2$, there exists a right-angled triangle with integral side lengths one of which is N.
對於每個整數 $N > 2$，存在一個邊長為整數的直角三角形，且其中一條邊長為 N。

Section A2 甲部 (二) (20 marks 分)

For each question, choose the **most appropriate** answer and mark the corresponding box (A, B, C, or D) on the answer sheet. One mark for each correct answer. No marks will be deducted for wrong answers.
請為下列每題各選一個**最適合**的答案，然後把答題紙對應的空格（A、B、C、或 D）填滿。
答對得一分，答錯不扣分。

6. What is the output of the following program? 以下程序的輸出是什麼？

C++

```
int main() {
  cout << 5 / 4 << ' ' << 5 / 4.0 << ' ' << 5.0 / 4;
}
```

A. `1 1 1`
B. `1 1 1.25`
C. `1 1.25 1`
D. `1 1.25 1.25`

7. What is the output of the following program? 以下程序的輸出是什麼？

C++

```
int i, c;
int main() {
  i = 0;
  c = 0;
  for (i = 1; i <= 5; ++i) {
    c = c + 1;
  }
  cout << c << ' ' << i;
}
```

A. `5 5`
B. `5 6`
C. `6 5`
D. `6 6`

8. Alice has a variable x. The initial value of x is 2. In each operation, Alice needs to either increase or decrease the value of x by 1, and she also needs to keep $1 \leq x \leq 4$ at all times. How many ways are there to perform four operations, so that the final value of x is 2?
愛麗絲有一個變量 x。x 的起始值為 2。在每個行動中，愛麗絲需要把 x 的數值增加或減少 1，她也需要時刻保持 $1 \leq x \leq 4$。有多少種方法進行四個行動，使得 x 的最終數值為 2？

A. 5
B. 6
C. 8
D. 10

9. Consider the following program: 考慮以下程序：

C++

```
int main() {
  int x = 5;
  int y;
  cin >> y;
  int z = x == y ? x + y : x - y;
  cout << z;
}
```

What are the respective outputs when `y = 5` and `y = 7`?
當 `y = 5` 和 `y = 7` 時，輸出分別是甚麼？

	`y = 5`	`y = 7`
A.	`0`	`12`
B.	`5`	`-2`
C.	`10`	`-2`
D.	`5`	`2`

10. Which of the following programs can be compiled successfully? 以下哪段程序能成功被編繹?

i.

C++

```
int main() {
  string s = "123";
  int x = 4;
  cout << s * x;
}
```

ii.

C++

```
int main() {
  string s = "123";
  int x = 456;
  cout << s + x;
}
```

A. i only 只有 i
B. ii only 只有 ii
C. i and ii i 和 ii
D. None of them 無

11. Alice loves to play an online game with her friends. Each round has at least 4 players, and 2 of the players are selected as imposters randomly with equal probability. Since Alice loves to be an imposter, she wants to know what is the maximum number of friends she can invite, such that she is expected to be the imposter in at least one out of seven rounds.
愛麗絲喜歡和她的朋友玩一款線上遊戲。每局至少有四名玩家，而當中兩名玩家在均等機率下會被隨機選為間諜。由於愛麗絲喜歡成為間諜，她想知道她最多可以邀請多少位朋友，使得她期望在七局遊戲中的至少一局可以成為間諜。

A. 11
B. 12
C. 13
D. 14

12. In a super-swap, you can choose a value i, and swap the i^{th} element and $(i+2)^{\text{th}}$ element in an array. Given the following arrays, if you can only use super-swap, what is the minimum number of super-swaps needed to sort them in ascending order respectively?
在一次超級交換中，你能夠選取任意一個 i，然後將數組中的第 i 個元素和第 $i+2$ 個元素交換。給定以下陣列，如果只能使用超級交換，最少分別需要進行多少次超級交換才能把陣列由小至大排序？

i. $P[8] = [8, 7, 6, 5, 4, 3, 2, 1]$
ii. $Q[9] = [9, 8, 7, 6, 5, 4, 3, 2, 1]$

	P	Q
A.	12	16
B.	Cannot be sorted 不能被排序	16
C.	28	36
D.	Cannot be sorted 不能被排序	Cannot be sorted 不能被排序

13. What is the output of the following program? 以下程序的輸出是什麼？

C++

```
int main() {
  int cnt = 0;
  for (int i = 0; i < 10; ++i) {
    for (int j = 0; j < 10; ++j) {
      if (i == j)
        break;
      ++cnt;
    }
  }
  cout << cnt;
}
```

A. `10`
B. `45`
C. `55`
D. `100`

14. Which of the following statements about binary search are true?
以下哪些對於二分搜索的描述是正確的？

i. Binary search can be applied to determine if a given string exists in an array of strings sorted in lexicographical order.
二分搜索可以用來判定一個給定的字串，是否存在於一個按字典序排列的字串陣列中。
ii. Binary search can be applied when there are multiple elements with the same value in the sorted array.
二分搜索能夠用在有多個相同值、經排序的陣列中。

A.	i only	只有 i
B.	ii only	只有 ii
C.	i and ii	i 和 ii
D.	None of them	無

15. You start with a string with one character `S`. In each step, you could perform one of the following actions:
你起初會有一個字串，字串有一個字母 `S`。每步你可以執行以下其中一個行動：

    1. Replace an `S` with `SS`.
    用 `SS` 取代一個 `S`。
    2. Replace an `S` with `(S)`.
    用 `(S)` 取代一個 `S`。
    3. Remove an `S` from the string.
    移除一個 `S`。

    Which of the following strings can be produced by the above actions?
    以下哪些字串可以用以上行動產生？

    i. `()(())`
    ii. `(()))((())`
    iii. `(()())`

    A. i and ii only 只有 i 和 ii
    B. i and iii only 只有 i 和 iii
    C. ii and iii only 只有 ii 和 iii
    D. i, ii and iii i、ii 和 iii

16. What is the output of the following program? 以下程序的輸出是什麼？

C++

```
int a[30];
int cnt;
int main() {
  cnt = 0;
  a[0] = 3;
  a[1] = -4;
  for (int i = 2; i < 30; ++i) {
    a[i] = a[i - 1] + a[i - 2];
    if (a[i] % 4 == 0)
      ++cnt;
  }
  cout << cnt;
}
```

    A. `4`
    B. `5`
    C. `9`
    D. `10`

17. Chess Cup is the top chess tournament in the Holy Kingdom Of Intelligence (HKOI). In the group stage, players will play against each other once. At first, each player will be granted some initial points.Then after each game, the winner of the game gains 3 points while the loser gains nothing. If the game is a draw, each player of the game are granted 1 point.
國際象棋杯是神聖智力帝國 (HKOI) 最頂尖的國際象棋大賽。在小組賽中，每位玩家都會跟其他玩家對戰一次。每位玩家一開始都會有初始分。在每場比賽後，勝者將會獲得 3 分，敗者將會獲得 0 分。如果比賽結果是和局，則比賽的雙方會各獲得一分。
Currently, 7 games has been played in a group and the score board is as follows.
目前一個小組比了七場比賽，積分表如下：

Player 玩家	vs Alice 對愛麗絲	vs Bob 對鮑伯	vs Charlie 對查理	vs David 對大衛	vs Edward 對愛德華	Initial Points 初始分	Total Points 總分	Current Rank 目前排名
Alice 愛麗絲	/	Win 勝	Draw 和	?	Draw 和	0.5	5.5	1
Bob 鮑伯	Lose 敗	/	Win 勝	?	Draw 和	0.4	4.4	3
Charlie 查理	Draw 和	Lose 敗	/	Win 勝	?	0.3	4.3	4
David 大衛	?	?	Lose 敗	/	Lose 敗	0.2	0.2	5
Edward 愛德華	Draw 和	Draw 和	?	Win 勝	/	0.1	5.1	2

There are 3 more games to be played in the group, Alice vs David, Bob vs David and Charlie vs Edward.
這小組還有三場比賽：愛麗絲對大衛、鮑伯對大衛、查理對愛德華。
Which of the following statements are true?
以下哪些陳述句為真？

i. David may get rank 1 after all games in the group have been played.
大衛可能在小組所有比賽比完後排名第 1。
ii. David may get rank 2 after all games in the group have been played.
大衛可能在小組所有比賽比完後排名第 2。
iii. David may get rank 3 after all games in the group have been played.
大衛可能在小組所有比賽比完後排名第 3。

A. None of them 無
B. i and ii only 只有 i 和 ii
C. ii and iii only 只有 ii 和 iii
D. i, ii and iii i 和 ii 和 iii

18. What is the output of the following program? 以下程序的輸出是什麼？

C++

```
int main() {
  int a[5] = {3, 1, 9, 2, 4};
  stack<int> x;
  queue<int> y;
  for (int i = 0; i < 5; ++i) {
    x.push(a[i]);
    y.push(a[i]);
  }
  while (!x.empty() && !y.empty()) {
    if (x.top() > y.front()) {
      x.pop();
    } else {
      y.pop();
    }
  }
  cout << x.size() << ' ' << y.size();
}
```

A. `0 2`
B. `0 4`
C. `2 0`
D. `3 0`

19. Suppose functions `f()` and `g()` use two different algorithms and both solve the same problem. Bob tested them with 2023 different valid inputs, and for all tested inputs, `f()` runs faster than `g()`.
假設函數 `f()` 和 `g()` 用了兩個不同的演算法都解決同一個問題。鮑伯用了 2023 個不同的有效輸入來測試它們，而在所有測試了的輸入中，`f()` 都運行得比 `g()` 快。

Given the above description, which of the following statements must be true?
已知上述的描述，以下哪些陳述句必然為真？

i. `f()` runs faster than `g()` for all inputs.
在所有輸入中 `f()` 都運行得比 `g()` 快。
ii. `f()` runs faster than `g()` for all valid inputs.
在所有有效輸入中 `f()` 都運行得比 `g()` 快。
iii. `f()` runs slower than `g()` for all invalid inputs.
在所有無效輸入中 `f()` 都運行得比 `g()` 慢。

A. i only 只有 i
B. ii only 只有 ii
C. iii only 只有 iii
D. None of them 無

20. What is the output of the following program? 以下程序的輸出是什麼？

C++

```
int main() {
  int ans = 0;
  for (int i = 0; i < 16; ++i) {
    ans += i | 8;
  }
  cout << ans;
}
```

A. `120`
B. `184`
C. `216`
D. `248`

21. Consider the following function: 考慮以下函數：

C++

```
int f(int x) {
  int cnt = 0;
  while (x) {
    if (x % 5 == 0)
      x += 3;
    else if (x % 2 == 0)
      x -= 4;
    else
      --x;
    ++cnt;
  }
  return cnt;
}
```

What is the return value of `f(28)`? 請問 `f(28)` 的返回值是什麼？

A. `7`
B. `8`
C. `11`
D. `12`

22. Alice and Bob are planning to have a meal with 6 friends. All 8 people are to sit around a circular table but Alice and Bob do not wish to sit next to each other. How many distinct seating arrangements are there? (Two arrangements are the same if, for every person, the persons sitting on their left are the same.)
愛麗絲和鮑伯計劃與 6 個朋友一起吃飯。他們 8 人要圍坐在一張圓桌旁，但愛麗絲和鮑伯不希望坐在一起。請問一共有多少種不同的座位安排？（如果對於每個人來說，坐在左邊的人在兩種安排中都相同，則兩種安排是相同的。）

A. 2520
B. 3600
C. 4320
D. 5040

23. What is the output of the following program? 以下程序的輸出是什麼？

C++

```
int main() {
  int n = 50;
  int cnt = 0;
  for (int i = 1; i <= n; ++i) {
    for (int j = 1; j <= n; ++j) {
      if (j % i == 0) {
        ++cnt;
      }
    }
  }
  cout << cnt;
}
```

A. 204
B. 205
C. 206
D. 207

24. Suppose the following statements are true.
假設以下陳述為真：

- If a typhoon is approaching Hong Kong, Charlie plays football with friends.
  如果有颱風接近香港，查理就跟朋友踢足球。
- If Charlie plays football with friends or Charlie wins a chess game, Charlie feels happy.
  如果查理跟朋友踢足球或查理勝出了一局國際象棋，查理就感到開心。
- If there is no typhoon approaching Hong Kong, Charlie does not feel happy.
  如果沒有颱風接近香港，查理就不感到開心。

Which of the following statements must be true?
以下哪些陳述句必然為真？

i. If there is no typhoon approaching Hong Kong, Charlie does not win any chess game.
   如果沒有颱風接近香港，查理就沒有勝出任何一局國際象棋。
ii. If there is no typhoon approaching Hong Kong, Charlie does not play football with friends.
   如果沒有颱風接近香港，查理就不跟朋友踢足球。
iii. If Charlie does not feel happy, Charlie wins a chess game.
   如果查理不感到開心，查理就勝出了一局國際象棋。

A. None of them 無
B. ii only 只有 ii
C. i and ii only 只有 i 和 ii
D. i, ii and iii i 和 ii 和 iii

25. For how many different integer inputs between −10000 and 10000 (inclusive) does the following program output `Nice`?
有多少個在 −10000 和 10000 之間（含）的整數輸入會使以下程序輸出 `Nice`？

C++

```
int main() {
  int a[10] = {-15, 19, 77, 4, -80, 56, 123, -147, 234, -2};
  int v;
  cin >> v;
  int cnt = 0;
  for (int i = 0; i < 10; ++i)
    if (a[i] >= v)
      ++cnt;
  if (cnt < 4)
    cout << "Too low";
  else if (cnt > 8)
    cout << "Too high";
  else
    cout << "Nice";
}
```

A. 72
B. 80
C. 125
D. 136

END OF SECTION A 甲部完

Section B 乙部 (20 marks 分)

The blanks are labeled from A to L. Please fill in the blanks on the answer sheet.
下列各空格分別命名為 A 至 L，請在答題紙上對應的地方填上答案。

Note 注意：

(1) Answers must be in C++. Completed programs shall be compiled and executed according to the procedure specified on Page 1.
您必須使用 C++ 作答。完成的程序將以第一頁之步驟進行編繹及執行。

(2) You can write only one character in each box on the answer sheet.
答題紙上每個小格只可填上一個字符。

(3) Answers must not exceed the designated number of boxes.
答案長度不得多於該題提供的小格數目。

(4) Write legibly. Unrecognizable answers will be regarded as incorrect.
字體須端正清楚，無法辨別之答案當錯誤論。

(5) If blank X is divided into N parts X1, X2, ..., XN, it means that marks will only be given when X1, X2, ..., XN are all correct.
如果空格 X 分為 N 部份 X1、X2、...、XN，那麼 X1、X2、...、XN 皆為正確才會給分。

1. Let `text` be a string. For every slash (`/`) in `text`, it is guaranteed that there must be `2023` immediately in front of each slash, and `24` immediately after each slash. For example, `text` can be `HKOI2023/24Heat` or `2023/242023/24`, but cannot be `2023/2024` or `/24`.
設 `text` 是一個字串。對於所有在 `text` 的斜線 (`/`)，保證有 `2023` 緊接在每個斜線之前，而且有 `24` 緊接在每個斜線之後。例如，`text` 可以是 `HKOI2023/24Heat` 或 `2023/242023/24`，但不可以是 `2023/2024` 或 `/24`。

Complete the function `Update(text)`, such that `Update(text)` change all `2023/24` in `text` into `2022/23`.
完成函數 `Update(text)`，使得 `Update(text)` 將所有在 `text` 中的 `2023/24` 變為 `2022/23`。

C++

```
void Update(string& text) {
  int len = text.length();
  for (int i = 0; i < len; ++i) {
    if (___A1___) {
      text[___A2___]--;
      text[___A3___]--;
    }
  }
}
```

Answer 答案: A1 A2 A3 (2 marks 分)

2. Let a be an array of integers of length n.
設 a 為一長度為 n 的整數陣列。

(a) Complete the following subprogram `ReversePrefix` with an input parameter k ($0 < k \leq n$) that reverses the subarray `a[0]`, `a[1]`, $\cdots$, `a[k-1]`.
完成以下包含輸入參數 k ($0 < k \leq n$) 的子程式 `ReversePrefix`，以翻轉子陣列 `a[0]`, `a[1]`, $\cdots$, `a[k-1]`。

C++

```
void ReversePrefix(int k) {
  for (int i = 0; i < ___B1___; ++i) {
    int j = ___B2___;
    swap(a[i], a[j]);
  }
}
```

Answer 答案: B1 B2 (1.5 marks 分)

(b) The subprogram `ReverseSubarray` with input parameters l and r ($0 \leq l < r \leq n$) reverses the subarray `a[l]`, `a[l+1]`, $\cdots$, `a[r-1]`. By using `ReversePrefix` only, complete the subprogram. Assume that `ReversePrefix` has been correctly implemented.
包含輸入參數 l 和 r ($0 \leq l < r \leq n$) 的子程式 `ReverseSubarray` 會翻轉陣列 `a[l]`, `a[l+1]`, $\cdots$, `a[r-1]`。透過只使用 `ReversePrefix`，完成這個子程序。假設 `ReversePrefix` 已被正確地實現。

C++

```
void ReverseSubarray(int l, int r) {
  ReversePrefix(___C1___);
  ReversePrefix(___C2___);
  ReversePrefix(___C3___);
}
```

Answer 答案: C1 C2 C3 (2 marks 分)

3. Without using "-", complete the following function `MyAbs` so that `MyAbs(x)` returns the absolute value of x.
在沒有使用 "-" 的情況下，完成函數 `MyAbs` 使得 `MyAbs(x)` 回傳 x ($-2^{31}+1 \le x \le 2^{31}-1$) 的絕對值。

C++

```
int MyAbs(int x) {
  if (x >= 0) return x;
  else return   D   ;
}
```

Answer 答案: _____D_____ (1.5 marks 分)

4. Consider the following program: 考慮以下程序：

C++

```
int main() {
  string a[8];
  for (int i = 0; i < 8; ++i) {
    cin >> a[i];
  }
  int count = 0;
  for (int i = 0; i < 8; ++i) {
    for (int j = i + 1; j < 8; ++j) {
      for (int k = 0; k < 5; ++k) {
        if (a[i].length() > k && a[j].length() > k
            && a[i][k] == a[j][k]) {
          ++count;
        }
      }
    }
  }
  cout << count;
}
```

If the input is `it is never too late to join hkoi`, what is the output?
若程序的輸入是 `it is never too late to join hkoi`，那麼輸出是什麼？

Answer 答案: _____E_____ (1.5 marks 分)

Give an input with lowercase English letters and spaces only, such that the program outputs `40`.
給一個只包括英文小楷字母及空格的輸入，使得程序輸出 `40`。

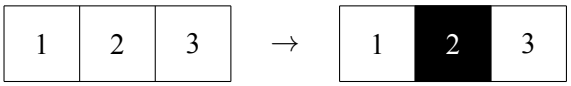
Answer 答案: _____F_____ (2 marks 分)

5. Alice and Bob is playing a game. There is a $1 \times N$ grid where every cell is initially white. Alice and Bob take turns to perform the following actions.
愛麗絲和鮑伯在玩一個遊戲。遊戲中有一個 $1 \times N$ 的網格。在遊戲開始前，所有格子都是白色的。愛麗絲和鮑伯將輪流採取以下行動：

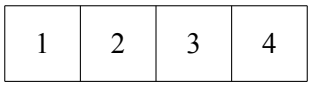
   1. Choose any cell such that the cell and all its adjacent cells are white.
      選擇一個它和它相鄰的格子全都是白色的格子。
   2. Paint the chosen cell black.
      把選擇的格子填成黑色。

   Alice plays first and if a player cannot make a valid move, they lose.
   Note: two cells are adjacent to each other if they share a common edge.
   愛麗絲先手。如果有玩家沒有合法的下一步，他將會輸掉這場遊戲。
   註：如果兩個格子擁有公共邊，它們就是相鄰的。

   For example, when $N = 3$, Alice can paint the cell 2 black and win since Bob has no valid moves after that.
   舉例當 $N = 3$ 時，愛麗絲可以把格子 2 填成黑色。那麼愛麗絲將會贏得這場遊戲，因為鮑伯並沒有合法的下一步。



   If both players play optimally, can Alice win the following games? If yes, find any winning first move and write down the cell's number. If no, write down 0.
   假設雙方都只會走最佳步，那麼愛麗絲能贏出以下的遊戲嗎？如果可以，請找出一步會達致勝利的第一步並填上該格子的數字。如果不可以，請填上 0。



   $N = 4$: G1

   $N = 5$: G2

   Answer 答案: G1 G2 (1 mark 分)

   $N = 9$: H1

   $N = 13$: H2

   Answer 答案: H1 H2 (1.5 marks 分)

6. Consider the following program: 考慮以下程序：

C++

```
int main() {
  for (int x = 0; x < 9; ++x) {
    for (int y = 0; y < 9; ++y) {
      cout << (   I, J, K   ? '.' : '#');
    }
    cout << endl;
  }
}
```

Complete the program so that it outputs the following:
完成程序使其得到以下輸出：

```
..#...#..
..#...#..
#########
..#...#..
..#...#..
..#...#..
#########
..#...#..
..#...#..
```

Answer 答案: _____I_____ (1.5 marks 分)

Complete the program so that it outputs the following:
完成程序使其得到以下輸出:

```
#########
#.......#
#.......#
#.......#
#.......#
#.......#
#.......#
#.......#
#########
```

Answer 答案: _____J_____ (1.5 marks 分)

Complete the program so that it outputs the following:
完成程序使其得到以下輸出:

```
....#....
....#....
....#....
....#....
####.####
....#....
....#....
....#....
....#....
```

Answer 答案: _____K_____ (2 marks 分)

7. In a game of Rock Paper Scissors, two players simultaneously form a shape of Rock, Paper, Scissors with a hand. For convenience, we represent Rock as 1, Paper as 2, and Scissors as 3. Rock beats Scissors, Paper beats Rock and Scissors beats Paper. If both players show the same shape, the game ends in a tie.
在一場剪刀石頭布的遊戲中，兩個玩家同時用手組成石頭、布、剪刀的形狀。為方便起見，我們將石頭表示為 1，布表示為 2，剪刀表示為 3。石頭打敗剪刀，布打敗石頭，剪刀打敗布。如果兩名玩家的形狀相同，則遊戲以平局結束。

C++

```
bool AWins(int a, int b) {
  return ___L___;
}
int main() {
  int a, b;
  cin >> a >> b;
  if (AWins(a, b))
    cout << "A Wins";
}
```

Alice and Bob play the shapes denoted by integers `a` and `b` respectively. Complete the program so that the program outputs `A Wins` if and only if Alice wins.
愛麗絲和鮑伯分別使出整數 `a` 和 `b` 所表示的形狀。完成程序，使得程序當且僅當愛麗絲獲勝時，輸出 `A Wins`。

Answer 答案: _____L_____ (2 marks 分)

END OF PAPER 全卷完