



國立臺灣大學

National Taiwan University

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2024 年臺大盃全國中學生程式設計競賽

決賽規則

2024 NTU Cup National Secondary School Programming Contest

Rules of Final Round

1. 本屆決賽為現場賽 (實體賽)，比賽時間為 16/9/2024 08:30 至 11:30。
This final competition is an on-site event. The competition time is from September 16th, 2024, from 08:30 to 11:30.
2. 參賽隊伍必須就座於大會安排的位置以進行比賽。
Participating teams must sit at the designated locations arranged by the organizer to compete.
3. 比賽用電腦將由大會提供，每一支隊伍將被分配到一台電腦。比賽前選手需要在測試時間 (15/9/2024) 進行設備檢驗以及登入測試。大會會盡力排除參賽者所遭遇的器材問題，但向工作人員反應器材問題為參賽者之責任。測試環節結束後，工作人員會將電腦進行重設。
The computers for the competition will be provided by the organizer. Each team will be assigned one computer. Before the competition, participants are required to perform equipment checks and log-in tests during the testing phase (September 15th). The organizer will do their best to resolve equipment issues, but it is the responsibility of the participants to report any problems to the staff. After the testing phase, the staff will reset the computers.
4. 所有參賽隊伍不得攜帶任何具計算或通訊功能之機器，包括但不限於智慧型手機、平板電腦、智慧型手錶 (智能手錶)、隨身碟 (閃存盤) 等等。一經

發現，大會有權取消該隊伍的參賽資格。

All teams are prohibited from bringing any electronic devices with computational or communication capabilities, including but not limited to smartphones, tablets, smartwatches, USB drives/flash drives, etc. If found, the organizer reserves the right to disqualify the team.

5. 參賽隊伍必須利用大會所提供的電腦登入到伺服器 (服務器) 以提交解答。
Teams must log into the server using the provided computer to submit their solutions.

6. 比賽期間，網際網路 (互聯網) 將會被關閉。所有參賽隊伍將被允許攜帶**兩本**參考書以及 50 張 A4 大小的紙張筆記進入會場，以供隊員作答參考。此外，自帶的 A4 紙筆記必須事先編號，以便於大會人員清點，若筆記無事先編號，大會人員有權利沒收之。

The internet will be disabled during the competition. All teams are allowed to bring up to **two** reference books and 50 A4-sized sheets of paper with notes into the contest venue for reference during the competition. Additionally, the A4 paper notes must be pre-numbered for easy verification by the organizer. If the notes are not pre-numbered, the organizer has the right to confiscate them.

7. 參考書可以有畫記，但不得有手寫或額外印製的程式碼。參考書的影印本是可以接受的，在裝訂妥當的前提下，可以被認定為一本書。然而，影印本中的章節必須來自同一本書，不得將來自不同書本的章節混雜裝訂在一起。若出現混雜裝訂等情況，視同紙張筆記，由前述第 6 條訂定之。

Reference books can have annotations but must not contain any handwritten or extra printed code. Photocopies of books are acceptable as long as they are properly bound and considered one book. However, photocopies must be from the same book, and chapters from different books cannot be combined. If found, they will be treated as paper notes, following the rules outlined in Article 6.

8. 所有資料、器材需要在決賽前一天 (15/9/2024) 測試期帶入會場，並在當晚由工作團隊進行檢查，正式比賽當天 (16/9/2024) 不能再額外攜帶資料或器材入場。

All materials and equipment must be brought into the venue during the testing phase on the day before the final (September 15th). The staff will inspect them that evening, and no additional materials or equipment may be brought in on the day of the competition (September 16th).

9. 大會將提供紙本以及電子版的試題，隊伍需要在 15/9/2024 測試階段勾選需要的紙本題目語言，否則一律印製英文紙本試題。參賽隊伍可依各自策略，安排隊員閱讀以及解答試題。題本語言以英文為主，大會額外提供中文和馬來文的翻譯，電子版皆可以從競賽平台下載。但若對題目有疑義、或者各語

言的題意有差異時，以英文版為準。

The organizer will provide both paper and electronic versions of the contest problems. Teams need to select the preferred language for the paper version during the testing phase on September 15th; otherwise, the contest problems will be printed in English by default. Teams can choose any problem to solve and submit their solutions through the contest platform for testing at any time during the competition. The problem statements are primarily in English, with additional translations provided in Chinese and Malay. In case of any discrepancies or ambiguities between the languages, **the English version will prevail**.

10. 大會將為各隊提供鉛筆及白紙以作草稿之用。同時提供列印服務讓選手列印程式碼。但請不要試圖列印題本來浪費資源，同時若需要額外的白紙也請直接和大會索取。

The organizer will provide pencils and papers for drafting, as well as printing services for participants to print their code. Please do not attempt to manually print the problem statements to avoid wasting resources. If additional blank paper is needed, please request it directly from the organizer.

11. 比賽期間，參賽者可以任意和同隊的隊友進行討論，但音量必須放輕，不得有干擾他隊的行為。

During the competition, participants are free to discuss with their teammates, but they must keep their voices down and avoid disturbing other teams.

12. 所有參賽者嚴禁大聲喧嘩，嚴禁和其他隊的隊員、非參賽者、以及非大會人員進行任何形式的溝通，也嚴禁以任何方式參考其他隊的答案。一經發現任何作弊現象，大會有權斟酌情況取消相關隊伍的參賽資格。

Participants are strictly prohibited from loud talking, communicating with members of other teams, non-participants, or non-organizers in any form, and from referencing answers from other teams. If any cheating is discovered, the organizer has the right to disqualify the relevant team.

13. 比賽將於 08:30am 正式開始。在比賽開始前 15 分鐘，各參賽隊伍可以開始檢查電腦作業系統和軟體(軟件)。試題將在比賽開始前 5 分鐘開放提供檢查。電腦提供的作業系統環境如下：

The competition will officially start at 08:30am. Fifteen minutes before the start, teams may begin checking the computer's operating system and software. The problem sets will be available for review five minutes before the competition begins. The provided operating system environment on the computers is as follows:

- OS: Ubuntu ICPC World Finals OS 2023 [[Link](#)]
- Desktop
 - ◆ GNOME
- Browser
 - ◆ Firefox

- Editors
 - ◆ vi/vim
 - ◆ gvim
 - ◆ emacs
 - ◆ gedit
 - ◆ geany
 - ◆ kate
- IDEs:
 - ◆ Eclipse (version 4.13, 2022-12), configured with:
 - Java Development Tooling (JDT) version 3.18.1400.v20221123-1800 using Java as listed above.
 - C++ Development Tooling (CDT) version 11.0.0 using C++ as listed above.
 - ◆ IntelliJ IDEA (Community Edition, version 2022.3), configured with:
 - Java as listed above
 - ◆ CLion (version 2022.3), configured with:
 - C/C++ as listed above
 - ◆ Code::Blocks (version 20.03-3.1), configured with:
 - C/C++ as listed above
 - ◆ VS Code (version 1.74.2), configured with
 - Microsoft C/C++ extension V1.15.4
 - **NOTE: the Judges will compile and execute C/C++ programs using C/C++ as listed under Languages, above, NOT using Microsoft C/C++.**

14. 比賽期間，每解出一題，就會發送該題對應的氣球至選手座位上。
During the competition, a balloon corresponding to each solved problem will be delivered to the team's table.
15. 比賽剩餘一小時，計分板將會凍結，選手將只能看見其他隊伍的上傳狀況，無法得知是否答對或解出。但氣球並不會停止發送。
One hour before the end of the competition, the scoreboard will freeze, and participants will only be able to see the submissions of other teams without knowing whether they were correct. Balloons will continue to be delivered.
16. 本次決賽總共有 15 道試題，各題配分如下：
This final round will consist of 15 problems:
- 1 題 5 分、1 題 10 分、5 題 15 分、2 題 20 分、4 題 30 分、以及 2 題 40 分。
1 problem worth 5 points, 1 problem worth 10 points, 5 problems worth 15 points, 2 problems worth 20 points, 4 problems worth 30 points, and 2 problems worth 40 points.
17. 參賽隊伍可隨意選取試題作答，並在比賽時間內，隨時通過競賽平台提交解答以進行測試。
Teams may choose any problem to solve and submit their solutions at any time during the competition through the contest platform.

18. 繳交的解答必須是原始碼 (源代碼 , Source Code) 。大會規定可使用的程式語言為 C 、 C++ 或 Java , 其對應的編譯器版本及參數如下 :

Submitted solutions must be in the form of source code. The allowed languages are C, C++, or Java. The corresponding compiler versions and parameters are as follows:

- Judgehost
 - ◆ gcc (Debian 11.3.0-12) 11.3.0
 - ◆ g++ (Debian 11.3.0-12) 11.3.0
 - ◆ Java:
 - OpenJDK Version "17.0.12" 2024-07-16
 - OpenJDK Runtime Environment (build 17.0.12+7-Debian-2deb12u1)
 - OpenJDK 64-Bit Server VM (build 17.0.12+7-Debian-2deb12u1, mixed mode, sharing)
- On-Site Contest Laptop:
 - ◆ gcc (Ubuntu 11.3.0-1ubuntu1~22.04) 11.3.0
 - ◆ g++ (Ubuntu 11.3.0-1ubuntu1~22.04) 11.3.0
 - ◆ Java:
 - OpenJDK Version "17.0.5" 2022-10-18
 - OpenJDK Runtime Environment (build 17.0.5+8-Ubuntu-2ubuntu122.04)
 - OpenJDK 64-Bit Server VM (build 17.0.5+8-Ubuntu-2ubuntu122.04, mixed mode, sharing)
- Compile command
 - ◆ C:

```
gcc -x c -Wall -O2 -static -pipe -o "$DEST" "$@" -lm
```
 - ◆ C++:

```
g++ -x c++ -std=gnu++20 -Wall -O2 -static -pipe -o "$DEST" "$@"
```
 - ◆ Java:

```
java -Dfile.encoding=UTF-8 -XX:+UseSerialGC -Xss${MEMSTACK}k -Xms${MEMLIMITJAVA}k -Xmx${MEMLIMITJAVA}k '$MAINCLASS' "$@"
```

19. 提交解答後 , 系統會安排評測並告知答案是「對」或是「錯」。

After submitting a solution, the system will evaluate it and notify whether the answer is "correct" or "incorrect".

- 答案為「對」時 , 系統會以「CORRECT」作為回答
If correct, the system will respond with "CORRECT".
- 答案為「錯」時 , 系統會以下列其中一種形式作為回答 :
If incorrect, the system will respond with one of the following:
 - **WRONG-ANSWER** : 程式正常結束 , 但輸出並不正確
WRONG-ANSWER: The program terminated normally, but the output was incorrect.
 - **TIMELIMIT** : 程式執行超出題目規定的時限
TIMELIMIT: The program exceeded the time limit specified by the

problem.

- **RUN-ERROR** : 程式不正常結束 (回傳值非 0) , 若記憶體用量超出題目規定的上限 , 也會以 RUN-ERROR 做為回答

RUN-ERROR: The program terminated abnormally (non-zero return value). If the memory usage exceeded the problem's limit, it will also be marked as RUN-ERROR.

- **OUTPUT-LIMIT** : 程式輸出的資料超出上限
OUTPUT-LIMIT: The program output exceeded the limit.

- **NO-OUTPUT** : 程式沒有輸出
NO-OUTPUT: The program did not produce any output.

20. 競賽平台使用「Lazy Evaluation」, 在單一題目內會有多組測試資料。當程式測試到一半時有任何一筆測試資料獲得「錯」的答案, 測試將直接被中止, 並回答對應的錯誤形式。

The contest platform uses "Lazy Evaluation," meaning if any test case results in an error, further tests for that problem will stop immediately, and the corresponding error type will be returned.

21. 「錯」的答案不會被扣分; 但是若最終這一道題被答對了, 該參賽隊伍先前對這道題**每一次**錯誤的嘗試, 將懲罰性地**增加該隊伍的使用時間 20 分鐘**。
Incorrect answers will not result in a score deduction, but if the problem is eventually solved correctly, every incorrect attempt will add a **20-minute penalty** to the team's total time.

- 請注意: 此規則與預賽不同(在預賽時, 錯誤的嘗試不會增加懲罰時間。)
Note: This rule differs from the preliminary round, where incorrect attempts did not incur a time penalty.

22. 「對」的答案會被記錄, 並在後期驗證檢查。若無任何問題, 分數將被累積到所屬隊伍之中。

Correct answers will be recorded and verified later. If no issues are found, the points will be added to the team's score.

23. 參賽隊伍可以嘗試解答同一道題, 但即使多次答對, 該隊也只能獲得一次分數, 而不會重覆得分。時間以最早提交答對的那一次為準。

Teams can attempt to solve the same problem multiple times, but even if they solve it more than once, they will only receive points for the first correct submission. The time for the earliest correct submission will be recorded.

24. 比賽期間若參賽者有任何對試題的問題, 須通過競賽平台提問。任何針對題目的修正皆會在競賽平台上公告, 隊伍需要自行留意。

If participants have any questions about the problems during the competition, they should ask through the contest platform. Any corrections to the problems will be announced on the contest platform, and teams should monitor it themselves.

25. 若碰到技術或試題上的問題，又或需要上洗手間，參賽者可舉手，然後靜待大會人員到來了解並嘗試解決問題。

If participants encounter technical or problem-related issues or need to use the restroom, they may raise their hand, and a staff member will assist them.

26. 比賽結束時，一支隊伍的得分，是該隊答對題目的分數的總和，但同題不重覆計分。

At the end of the competition, a team's score will be the sum of the points for all the problems they solved correctly, but they will not receive duplicate points for the same problem.

27. 若兩支隊伍得分相同，則以較少的使用時間為優勝。使用時間是每一道答對題目的第一次答對時間總和加上之前答錯題的懲罰時間。對於每一道答對題目，在答對前的每一次錯誤嘗試都會增加 20 分鐘的懲罰時間。

If two teams have the same score, the team with the shorter total time will rank higher. The total time includes the time taken to solve each problem plus the penalty time for incorrect attempts before the correct solution.

28. 本次決賽以分數高者為主要排名依據，同分數者，則以使用時間作為排名依據，使用時間少者有較高的排名。

The ranking will primarily be based on the team's score. In case of a tie, the team with the shorter total time will rank higher.

29. 大會保留一切更改以上注意事項以及規則的權力。一切規則將以大會即時公布為準。一切事宜，大會的決定將是最終的決定。

The organizers reserve the right to make changes to the above rules and policies at any time. All decisions made by the organizers will be final.