MCM: The Mathematical Contest in Modeling
ICM: The Interdisciplinary Contest in Modeling
MCM:数学建模竞赛
ICM:交叉学科建模竞赛

MCM®/ICM®

Contest Rules, Registration and Instructions

比赛规则、注册和说明

February 16-20, 2023

2023 年 2 月 16 日至 20 日

(All rules and instructions apply to both ICM and MCM contests.)

(所有规则和说明适用于 ICM 和 MCM 竞赛.)

RECENT CHANGES TO THE MCM/ICM RULES ARE HIGHLIGHTED IN RED

MCM/ICM 规则的最新更改以红色突出显示

COMAP'S Mathematical Contest in Modeling (MCM®) / Interdisciplinary Contest in Modeling (ICM®) is an international contest designed to provide undergraduate students with the opportunity to work as team members to engage in and improve their modeling, problem solving, and writing skills. Teams apply mathematics to model, develop, and communicate a solution to a real-world problem.

COMAP 数学建模竞赛(MCM) /跨学科建模竞赛(ICM)是一项国际竞赛，旨在为本科生提供作为团队成员参与并提高其建模、解决问题和写作技能的机会. 团队应用数学建模、开发和交流现实世界问题的解决方案.

[MCM/ICM: Procedures and Tips for a Great Experience](#)
The purpose of this article is to assist and guide students and advisors participating in **The Mathematical Contest in Modeling (MCM)** and **The Interdisciplinary Contest in Modeling (ICM)** . In the article, COMAP provides information about the administration of the contests from registration through solution submission, as well as tips to ensure your contest experience is smooth, successful, and enjoyable.

MCM/ICM：获得良好体验

本文的目的是帮助和指导参加数学建模竞赛（MCM）和跨学科建模竞赛（ICM）的学生和顾问。在文章中，COMAP 提供了从注册到提交解决方案的比赛管理信息，以及确保您的比赛体验顺利、成功和愉快的提示。

2023 Contest Dates and Times:

- Registration Deadline: Before 3:00 p.m. EST on Thursday, February 16, 2023.
- Contest Starts: 5:00 p.m. EST on Thursday, February 16, 2023.
- Contest Ends: 8:00 p.m. EST on Monday, February 20, 2023.
- Solution Report Deadline: 9:00 p.m. EST on Monday, February 20, 2023.
- Contest Results: The results will be posted on or before May 31, 2023.

2023 年比赛日期和时间：

● 报名截止时间：美国东部时间 2023 年 2 月 16 日周四下午 3:00 前.

● 比赛开始时间：美国东部时间 2023 年 2 月 16 日星期四下午 5 点.

● 比赛结束时间：美国东部时间 2023 年 2 月 20 日星期一晚上 8 点.

● 解决方案报告截止时间：美国东部时间 2023 年 2 月 20 日星期一晚上 9 点.

● 比赛结果：结果将于 2023 年 5 月 31 日或之前公布.

MCM/ICM Rules, Registration, and Instructions

MCM/ICM 规则、注册和说明

Notes:

- **COMAP is in the USA Eastern time zone: all times given in these instructions are in terms of Eastern Standard Time (EST) except where local time is noted.**
- **COMAP is the final arbiter of all rules and policies, and may refuse to register, disqualify, or reduce the award level of any team that, in its sole discretion, does not follow contest rules, regulations, or requirements.**
- **Decisions of the judges, the contest directors, and the editor of The UMAP Journal are final.**
- **Please print a copy of these contest instructions for reference before, during, and after the contest. Click here for the printer friendly version.**

注意事项：

● COMAP 位于美国东部时区：这些说明中给出的所有时间均以东部标准时间（EST）为准，除非注明当地时间。

● COMAP 是所有规则和政策的最终仲裁者，可自行决定拒绝注册、取消资格或降低任何不遵守比赛规则、规定或要求的团队的奖 励水平。

● 评委、竞赛主管和 UMAP 期刊编辑的决定为最终决定。

● 请在比赛之前、期间和之后打印这些比赛说明的副本以供参考。单击此处查看打印机友好版本。

I. Participants and Advisors

Team Members: A team may consist of up to three students currently enrolled in the same school. Students may be enrolled in any department or program at the school. There is no limit to the number of teams a school may register. The contest is open to all undergraduate and high school students. An advisor must complete the registration process for each team.

Team Advisors: Any faculty, staff member, or student at the team's institution can fulfill the role of Advisor. The advisor will act as the main point of contact for the team, and does not have to be from the mathematics department. We encourage faculty members to serve as team advisors; however, one team member or another student at the school may act as the advisor.

一、参与者和顾问

团队成员：一个团队最多可以由目前就读于同一所学校的三名学生组成。学生可以就读于学校的任何部门或课程。学校可以注册的团队数量没有限制。比赛对所有本科生和高中生开放。顾问必须完成每个团队的注册过程。

团队顾问：团队机构的任何教职员工或学生都可以担任顾问的角色。顾问将作为团队的主要联系人，不必来自数学系。我们鼓励教职员工担任团队顾问；但是，学校的一名团队成员或另一名学生可以担任顾问。

II. MCM/ICM Resource Guide

MCM-ICM: Procedures and Tips for a Great Experience
The purpose of this article is to assist and guide students and advisors participating in The Mathematical Contest in Modeling (MCM) and The Interdisciplinary Contest in Modeling (ICM). In the article, COMAP, provides information about the administration of the contests, as well as tips to ensure your contest experience is smooth, satisfying, enjoyable, and successful.

二、MCM/ICM 资源指南

MCM-ICM：获得良好体验的程序和技巧

本文的目的是帮助和指导参加数学建模竞赛（MCM）和跨学科建模竞赛（ICM）的学生和顾问。在文章中，COMAP 提供了有关比赛管理的信息，以及确保您的比赛体验顺利、令人满意、愉快和成功的提示。

III. Changes for 2023

- Follow @COMAPMath on Twitter or COMAPCHINAOFFICIAL on Weibo for the most up to date information.
- Registration process has been streamlined and split into 2 parts: Advisor Registration and Team Registration.
- The MCM/ICM Contest now have a 25 page limit. The 25 page limit applies to the entire submission including the Summary Sheet, Solution, Reference List, Table of Contents, Notes, Appendices, Code and any problem specific requirements.
- Due to the Covid-19 virus teams are encouraged to meet virtually using electronic communications. BUT, your team members may only communicate with members of their own team. The rule remains that teams may not use any persons, other than their own team members, to discuss or obtain ideas for working on and solving their problem.

三. 2023 年的变化

- 关注 Twitter 上的@COMAPMath 或微博上的 COMAPCHINAOFFICIAL，了解最新信息.
- 注册流程已经简化，分为两个部分：顾问注册和团队注册.
- MCM/ICM 竞赛现在有 25 页的限制. 25 页的限制适用于整个提交材料，包括摘要表、解决方案、参考列表、目录、注释、附录、代码和任何特定问题的要求.
- 由于新冠肺炎病毒，团队被鼓励使用电子通信进行虚拟会面. 但是，您的团队成员只能与自己团队的成员交流. 规则仍然是，除了他们自己的团队成员之外，团队不得使用任何人来讨论或获得解决问题的想法.

IV. Contest Rules

1. The 2023 MCM/ICM contest period runs between 5:00 p.m. EST Thursday, February 16, 2023 and 8:00 p.m. EST on Monday, February 20, 2023.
2. Each team may consist of a maximum of three undergraduate (or below) students enrolled full- or part-time at the same school/institution at the time of the contest. Teams may consist of 1, 2, or 3 students and each student may only participate on one team.
3. Each team must have an advisor who is a staff member, a faculty member, or a student at the team members' institution. Advisors can serve more than one team. Advisors must register teams prior to 3p.m. EST on Thursday, February 16, 2023.
4. Teams must obtain and use the Control Number and password assigned to them at registration to participate in MCM/ICM.

5. Not later than the opening of the contest window, advisors must assign team members to a particular team, and cannot add or change student assignments for the duration of the contest. Teams may, however, remove a team member, if he or she decides not to participate.

6. Once the contest window opens (5:00 p.m. on Thursday, February 16, 2023), **team membership must be set and teams may not use any persons, other than their own team members, to discuss or obtain ideas for working on and solving their problem.** Teams **may** use any "inanimate" resource they find on their own such as: web pages, books, articles, research reports, databases, etc. Teams **may not** seek help in obtaining answers, ideas, or information, or in locating appropriate resources, from any persons outside of their team to include their advisor, other teachers, other students, and/or experts or professionals in a field relevant to the problem. This restriction includes personal or telephonic contact, as well as use of electronic social media such as, but not limited to: emails, texting, chat rooms, question-answer systems, interactive blogs, Twitter, Weibo, online help or support sites, etc. Additionally, posting or sharing any part or all of the problem statement, your team's solution process, or any partial or complete work in any form or medium during the contest is strictly prohibited. COMAP will disqualify or deem unsuccessful any team that violates this rule. The relevant issue is one of intent: each team of students is expected to develop all of its substantive analysis and solution without the help of others.

7. Teams must document any outside sources of information by using footnotes, endnotes, or in-line documentation, and include appropriate citations in a reference list or Bibliography of these sources.

8. Teams choose to work on one problem (MCM: A, B, or C or ICM: D, E, or F) and submit one solution for the problem of their choice.

9. The names of the students, advisor, and/or institution must not appear on any page of the solution. The solution must not contain any identifying information other than the team Control Number.

10. Papers must be submitted as an Adobe PDF electronic file, and typed in English, with a readable font of at least 12-point type. Papers must be within the 25 page limit.

11. Upon closing of the contest window at 8:00 p.m. EST Monday, February 20, 2023, advisors must ensure each team makes no further changes to their solution paper. Advisors must then ensure all solution documents are properly prepared and sent via email to COMAP for judging no later than **9:00 p.m. EST Monday, February 20, 2023** .

12. COMAP follows all accommodations relative to learning conditions for individual students used as part of the local school/institution program in an affected student's daily learning. If specialized staff is required, the school bears the responsibility for providing any specialized assistance as required by law. If such accommodations are required for a student participating, the school should detail them and the extent to which they were utilized as part of the MCM/ICM activities.

13. COMAP reserves the right to disqualify or reduce the award level of teams found to have violated the contest rules.

四. 比赛规则

1、2023 年 MCM/ICM 比赛时间为美国东部时间 2023 年 2 月 16 日星期四下午 5 点至美国东部时间 2023 年 2 月 20 日星期一晚上 8 点.

2、每个团队最多可以由三名本科（或以下）学生组成，比赛时在同一所学校/机构就读全日制或非全日制。团队可能由 1、2 或 3 名学生组成，每个学生只能参加一个团队。

3、每个小组必须有一名顾问，该顾问必须是小组成员所在机构的职员、教员或学生. 顾问可以为多个团队服务. 顾问必须在美国东部时间 2023 年 2 月 16 日星期四下午 3 点之前注册团队.

4、团队必须获得并使用在注册时分配给他们的控制号和密码才能参加 MCM/ICM。

5、在比赛窗口打开之前，顾问必须将团队成员分配到特定团队， 并且在比赛期间不能添加或更改学生作业。但是，如果团队成员决定不参与，团队可以移除该成员。

6、一旦比赛窗口打开(2023 年 2 月 16 日星期四下午 5 点)，必须确定团队成员,团队不得使用除自己团队成员之外的任何人来讨论或获取解决问题的想法. 团队可以使用他们自己找到的任何"无生命"资源，例如：网页、书籍、文章、研究报告、数据库等。团队不得从团队之外的任何人那里寻求帮助以获取答案、想法或信息，或寻找适当的资源， 包括他们的顾问、其他教师、其他学生和/或与问题相关领域的 专家或专业人士。此限制包括个人或电话联系，以及使用电子 社交媒体，例如但不限于：电子邮件、短信、聊天室、问答系 统、交互式博客、Twitter、微博、在线帮助或支持网站等. 此外，严禁在比赛期间以任何形式或媒介发布或分享问题陈述的 任何部分或全部、您团队的解决方案或任何部分或全部工作。COMAP 将取消任何违反此规则的团队的资格或将其视为不成功。相关问题是一个意向性问题：每个学生小组都应该在没有其他 人

帮助的情况下开发其所有实质性分析和解决方案。

7、团队必须使用脚注、尾注或内联文档记录任何外部信息来源，并在这些来源的参考列表或参考书目中包含适当的引用。

8、团队选择解决一个问题（MCM：A、B 或 C 或 ICM：D、E 或 F）并为他们选择的问题提交一个解决方案。

9、学生、顾问和/或机构的姓名不得出现在解决方案的任何页面上。该解决方案不得包含除团队控制编号之外的任何识别信息。

10、论文必须以 Adobe PDF 电子文件形式提交，并以英文输入，至少 12 号字体的可读字体。论文必须在 25 页的限制内。

11、美国东部时间 2023 年 2 月 20 日星期一晚上 8:00 竞赛窗口关闭后，顾问必须确保每个团队不再对其解决方案论文进行任何修改. 然后，顾问必须确保所有解决方案文件准备妥当，并在不迟于以下时间通过电子邮件发送给 COMAP 进行评审美国东部时间 2023 年 2 月 20 日星期一晚上 9 点   .

12、COMAP 在受影响学生的日常学习中遵循与作为当地学校/机构计划一部分的个别学生的学习条件相关的所有调整。如果需要专门的工作人员，学校有责任根据法律要求提供任何专门的帮助。如果参与的学生需要此类便利，学校应详细说明它们以及它们在多大程度上被用作 MCM/ICM 活动的一部分。

13、COMAP 保留取消发现违反比赛规则的团队的资格或降低其奖励水平的权利。

V. Contest Registration

The registration fee for MCM/ICM is $100 per team. Please register only the teams that will take part in the contest. Registration fees are non-refundable. We accept payment via Credit Card, and payment must be made via our secure web site. Our secure site will process your credit card payment, so your credit card number is protected. Our system will not store your credit card number after it processes your payment. We regret that we are not able to accept other payment forms at this time.

All teams must be registered before 3:00 p.m. EST on Thursday, February 16, 2023. We recommend that all teams complete the registration process well in advance,

since the registration system will not accept any new team registrations after the deadline. COMAP will not accept late registrations for MCM/ICM 2023 **under any circumstances. NO EXCEPTIONS WILL BE MADE.** Note: Advisors do not have to designate specific team members when registering "a team." COMAP suggests you register the number of teams needed well prior to the deadline and then return to the contest site once team membership is set to enter specific students to each "Control Number" team you have registered.

The 2-part registration process will take advisors through a series of screens that ask for an email address and contact information. Enter the required information as you step through the screens. **Be sure to use a valid current email address** so that we can use it to contact you at any point before, during, or after the contest, if necessary.

五、比赛报名

MCM/ICM 的注册费为每队 100 美元。请仅注册将参加比赛的团队。注册费不予退还。我们接受信用卡付款，付款必须通过我们的安全网站进行。我们的安全网站将处理您的信用卡付款，因此您的信用卡号码受到保护。我们的系统在处理您的付款后不会存储您的信用卡号。很遗憾，我们目前无法接受其他付款方式。

所有团队必须在美国东部时间 2023 年 2 月 16 日星期四下午 3:00 之前注册. 我们建议所有团队提前完成注册过程，因为注册系统在截止日期后将不再接受任何新的团队注册. COMAP 不接受 MCM/ICM 2023 的逾期注册在任何情况下. 没有例外. 注意：顾问在注册"团队"时不必指定特定的团队成员。COMAP 建议您在截止日期之前注册所需的团队数量，然后在团队成员设置为您注册的每个 "控制号"团队输入特定学生后返回竞赛站点。

由两部分组成的注册过程将引导顾问通过一系列要求提供电子邮件地址和联系信息的屏幕。在您逐步浏览屏幕时输入所需的信息。请务必使用当前有效的电子邮件地址，以便我们可以在比赛之前、期间或之后的任何时间（如有必要）使用它与您联系。

1. **All Registration Activity: /undergraduate/contests/mcm.** COMAP will accept no other forms of registration. Advisors may register any number of teams, and should use the same email address and password for all teams under the same advisor.

2. **Advisor Registration:** If you are an advisor entering the contest site for the first time for the 2023 contest, click on **Register for Contest** on the left-hand side of the screen to register as an Advisor. Enter your email and click Continue Advisor Registration. Follow the step to continue and finish your registration. **IMPORTANT:** Be sure to use a valid and current email address as you will use this email to register all of your teams, and communicate with COMAP. Additionally, COMAP will use this email to contact you at any point before, during, and after the contest, if necessary.

3. **Register a Team or Teams:** On contest site, click on Advisor Login , then log in with the same email address and password that you used when you registered as an advisor. Once you are logged in, click on **Register Team** near the upper right corner of the page and follow the instructions there. **There is no restriction on the number of teams an advisor can register.**

   a. Fill in billing information. After we receive approval from your financial institution (this takes only a few seconds), the system will issue a control number for your team.

   b. Each team is not officially registered until you have received a team **control number for that team** . The registration page also lists the email address and password that you entered when registering; you will need this information to complete the contest procedures. **Make a record of each team control number.** You will **NOT** receive an email confirmation of your registration.

   c. You may specify the team members at the time of registration, or at a later time. Advisors may assign team members to specific teams and control numbers up until the beginning of the contest period. Once the contest opens, team members cannot be added or changed. The spelling of all names and institutions is the responsibility of the advisor. This is exactly as they will appear on certificates. The order of the student names has no bearing or importance on participation. In the eyes of COMAP and the contest directors,all team members are equal.Advisors should ensure they spell team members' names correctly when registering. COMAP will not reprint certificates.

   d. To register additional teams, repeat the procedures listed above.

4. If you need to change any of the advisor or institution information (name, address, contact information, etc.) that you specified when you registered, you can do so at any point before or during the contest by logging in to the contest web site with the same email address and password that you used when registering (click on the Advisor Login link on the left side of the screen). Once logged in, click on the **Edit Advisor or Institution Data** link near the upper right corner of the page.

5. Check the contest web site regularly for any updated instructions or announcements about the contest. Except in extreme circumstances, COMAP will not send any confirmation, reminders, or announcements by email. All communication regarding the contest will be via the contest web site and Twitter/Weibo.

6. New! Follow COMAPMath on Twitter or COMAPCHINAOFFICIAL on Weibo for the most up to date information before, during, and after the contest.

1.所有注册活动:/undergraduate/contests/mcm.COMAP 不接受其他形式的

注册。顾问可以注册任意数量的团队，并且应该对同一顾问下的所有团队使用相同的电子邮件地址和密码。

2、顾问注册：如果您是首次进入 2022 年比赛现场的顾问，请单击屏幕左侧的"注册比赛"以注册成为顾问。输入您的电子邮件，然后单击继续顾问注册。按照该步骤继续并完成注册。重要：请务必使用有效且最新的电子邮件地址，因为您将使用此电子邮件注册所有团队，并与 COMAP 进行通信。此外，如有必要，COMAP 将使用此电子邮件在比赛前，比赛期间和比赛后的任何时候与您联系。

3、注册一个或多个团队：在比赛网站上，点击顾问登录，然后使用您注册为顾问时使用的相同电子邮件地址和密码登录。登录后，单击页面右上角附近的"注册团队"，然后按照那里的说明进行操作。顾问可以注册的团队数量没有限制。

a.填写帐单信息。在我们收到您的金融机构的批准后（这只需要几秒钟），系统将为您的团队发出一个控制号码。

b.在您收到该团队的团队控制编号之前，每个团队都不会正式注册。注册页面还列出了您在注册时输入的电子邮件地址和密码;您将需要此信息来完成比赛程序。记录每个团队控制号码。您将不会收到确认注册的电子邮件。

c.您可以在注册时或稍后指定团队成员。顾问可以将团队成员分配到特定的团队，并控制数量，直到比赛期开始。比赛开始后，无法添加或更改团队成员。所有名称和机构的拼写是顾问的责任。这与它们将显示在证书上完全相同。学生姓名的顺序与参与无关或无关紧要。在 COMAP 和大赛总监的眼中，所有团队成员都是平等的。顾问应确保他们在注册时正确拼写团队成员的姓名。COMAP 不会重印证书。 d.要注册其他团队，请重复上面列出的过程。

4.如果您需要更改您在注册时指定的任何顾问或机构信息（姓 名，地址，联系信息等），您可以在比赛前或比赛期间的任何时候使用注册时使用的相

同电子邮件地址和密码登录比赛网站。（点击屏幕左侧的顾问登录链接）。

登录后，单击页面右上角附近的编辑顾问或机构数据链接。

5、请定期查看竞赛网站，了解有关竞赛的任何更新说明或公告。除极端情况外，COMAP 不会通过电子邮件发送任何确认，提醒或公告。所有关于比赛的沟通将通过比赛网站和 Twitter/微博进行。

6、新增功能！在比赛之前、期间和之后，请在 Twitter 上关注 COMAPMath 或在微博上关注 COMAPCHINAOFFICIAL，了解最新信息.

VI. Contest Instructions

Before the Contest - Preparing a Team

1. We encourage advisors and faculty to coach and prepare students **BEFORE** the start of the contest. COMAP offers several resources:
   a. Go to the MCM/ICM web site and review the rules, guidelines, and prior years' problems.
   b. Visit **www.mathmodels.org** to view previous years' problems and solutions.
   c. Visit **/undergraduate/contests/resources/index.html** , the MCM/ICM Articles, Resources, and Links page.
   d. The MCM/ICM "Tips" article (found on the resource web page) provides students and advisors tips for before, during, and after the contest.
   e. Read the Summer and Fall UMAP Journal MCM and ICM articles, which include the Director's Article and Judges' Commentary for MCM and ICM. These articles describe what judges look for in the various sections of solutions.
2. Ensure that students have access to computers that enable them to word process, use a spreadsheet, and dynamically model both graphs and geometric relationships.

六、比赛须知

比赛前-准备团队

1、我们鼓励顾问和教师在比赛开始前指导和准备学生。COMAP 提供了几种资源：

a.请访问 MCM/ICM 网站，查看规则、指南和前几年的问题。

b.访问 www.mathmodels.org 以查看前几年的问题和解决方案。

c.请访问 ：

https://www.comap.com/undergraduate/contests/resources/index.html

MCM/ICM 文章、资源和链接页面。

d.MCM / ICM"提示"文章（可在资源网页上找到）为学生和顾问提供了比赛前，比赛期间和之后的提示。

e。阅读夏季和秋季 UMAP 期刊 MCM 和 ICM 文章，其中包括导演的文章以及 MCM 和 ICM 的评委评论。这些文章描述了法官在解决方案的各个部分中寻找的内容。

2、确保学生能够访问计算机，使他们能够进行文字处理，使用电子表格以及对图形和几何关系进行动态建模。

During the Contest - Choosing and Solving the Problem

1. The contest problems become available for teams to view at precisely 5:00 p.m. EST on Thursday February 16, 2023 on the contest web site:
   /undergraduate/contests/mcm
   No password is needed to view the problems. Simply go to the contest web site at or after 5 p.m. EST on Thursday, February 16, 2023 and you will see a link to view the problems.

2. The contest problems will also become available for teams to view precisely at 4:50PM EST on Thursday February 16, 2023 on the following mirror sites:
   http://www.comapmath.com/MCMICM/index.html
   http://www.comap-math.com/mcm/index.html
   http://www.mathportals.com/mcm/index.html
   http://www.immchallenge.org/mcm/index.html
   If you cannot access any of the sites, there may be a problem with your local Internet connection. Contact your local Internet service provider to resolve the issue.

3. Each registered team may choose any one of the six problem choices and should submit a solution to only one problem.
   ● **MCM problems are Problem A, Problem B or Problem C.**
   ● **ICM problems are Problem D, Problem E or Problem F.**

4. Teams may use any inanimate source of data, materials, computers, software, references, websites, books, etc. Teams should reference all sources used using footnotes, endnotes, or in-line documentation, and include an associated reference list citing all sources.

5. Teams may not seek help from any person outside of team members as delineated in the Contest Rules (specifically Rule #6).

6. Teams should keep in mind the following guidelines when solving the problem and developing their solution.

a. **Summary Sheet:** The summary is an essential part of your MCM/ICM paper and should appear as the first page of your solution report. The judges place considerable weight on the summary, and winning papers are often distinguished from other papers based on the quality of the summary. **Click here to download the Microsoft Word Summary Sheet** or **Click here to download the LaTeX Summary Sheet.**

• To write a good summary, imagine that a reader will choose whether to read the body of the paper based on your summary: Your concise presentation in the summary should inspire a reader to learn about the details of your work.

• You should write the summary last, as it should clearly describe your approach to the problem and, most prominently, your most important conclusions. Ensure you plan time after solving your problem to write a comprehensive and articulate summary.

• Summaries that are mere restatements of the contest problem, or are a cut-and-paste boilerplate from the Introduction are generally considered to be weak.

b. **Overall:** The team's solution should be articulate, concise, and organized in order to allow the reader to easily follow the solution process and conclusions. Key statements should present major ideas and results.

• A Table of Contents assists the reader in previewing the organization of your report.

• Present a clarification or restatement of the problem as appropriate.

• Present a clear exposition of all variables and hypotheses.

• State and justify reasonable assumptions that bear on the problem.

• Present an analysis of the problem, motivating or justifying the model being used.

• Summarize derivations, computations, or illustrative examples in the main body of the solution, and leave lengthy derivations and/or calculations and data in appropriate appendices.

• Include a design of the model. Discuss how the model could be tested, to include error analysis, sensitivity, and/or stability.

• Discuss any apparent strengths or weaknesses to your model or approach.

• Provide a conclusion and report results explicitly.

• Document resources and references.

7. New! Follow COMAPMath on Twitter or COMAPCHINAOFFICIAL on Weibo for the most up to date information before, during, and after the contest.

比赛期间 – 选择和解决问题

1、竞赛问题将于美国东部时间 2023 年 2 月 16 日(星期四)下午 5:00 准时在竞赛网站上公布:/undergraduate/contests/mcm 查看问题不需要密码. 只需在美国东部时间 2023 年 2 月 16 日星期四下午 5 点或之后访问竞赛网站,您将看到一个查看问题的链接.

2、竞赛问题也将于美国东部时间 2023 年 2 月 16 日(星期四)下午 4:50 分在以下镜像网站上向参赛队开放:
http://www.comapmath.com/MCMICM/index.html
http://www.comap-math.com/mcm/index.html
http://www.mathportals.com/mcm/index.html

http://www.immchallenge.org/mcm/index.html
如果您无法访问任何网站，您的本地互联网连接可能有问题.请联系您当地的互联网服务提供商来解决问题.

3、每个注册小组可以选择六个问题中的任何一个，并且只能提交一个问题的答案.

- MCM 问题是问题 A、问题 B 或问题 c.
- ICM 问题是问题 D、问题 E 或问题 f.

4、团队可以使用任何无生命的数据、材料、计算机、软件、参考资料、网站、书籍等来源。团队应使用脚注、尾注或内嵌文档引用所有使用的来源，并包括引用所有来源的相关参考列表。

5、团队不得向比赛规则（特别是规则#6）中规定的团队成员以外的任何人寻求帮助。

6、团队在解决问题和开发解决方案时应牢记以下准则。

a.摘要表：摘要是 MCM/ICM 论文的重要组成部分，应出现在解决方案报告的第一页。评委非常重视摘要，获奖论文通常会根据摘要的质量与其他论文区分 开来。单击此处下载 Microsoft Word 摘要表或单击此处下载 LaTeX 摘要表。

- 要写一个好的摘要，假设读者会根据你的摘要来选择是否阅读论文的正文：摘要中简洁的陈述应该能激发读者了解你工作的细节。
- 你应该最后写总结，因为它应该清楚地描述你解决问题的方法，最突出的是你最重要的结论。确保您在解决问题后计划好时间来撰写全面而清晰的摘要。
- 仅仅是对比赛问题的重述，或者是引言中的剪切和粘贴样板，通常被认为是薄弱的。

b.总体：团队的解决方案应该清晰、简洁、有条理，以便让读者轻松理解解决方案的过程和结论。关键陈述应该提出主要的想法和结果。

- 目录可帮助读者预览报告的组织结构。
- 酌情说明或重述问题。
- 清晰地阐述所有变量和假设。
- 陈述并证明与问题有关的合理假设。
- 提出对问题的分析，激励或证明正在使用的模型。
- 在解决方案的主体中总结推导、计算或说明性示例，并将冗长的推导和/或计算和数据留在适当的附录中。
- 包括模型设计。讨论如何测试模型，包括误差分析、灵敏度和/或稳定性。
- 讨论您的模型或方法的任何明显优势或劣势。
- 提供结论并明确报告结果。

● 记录资源和参考。

During the Contest – Preparing a Solution Document

1. MCM/ICM solutions are judged as varying degrees of successfully completing the contest (from Successful Participant up to Outstanding). There is no passing or cut-off score, and therefore, partial solutions are acceptable and teams are encouraged to complete as much of the problem as they are able to do. MCM/ICM judges are primarily interested in the team's thought processes, analysis of the problem, modeling approaches, and mathematical methods.

2. Teams must submit their entire solution in one **Adobe PDF** electronic file, consisting of written text, figures, charts, and supporting materials. Papers must be typed in English, with a readable font of at least 12-point type. Do not send additional â€œnon solutionâ€ files such as data or computer programs.

3. Each page of the solution must contain the team control number and the page number at the top of the page. Use a page header on each page - for example: **Team # 2312345, Page 6 of 25** .

4. Your solution report should start with the Summary Sheet followed by the team's solution. Ensure your solution meets the 25 page limit requirement. A Table of Contents is encouraged and does count toward the page limit. Reference list (or Bibliography), notes pages, and any appendices now count toward the page limit and should be included after the solution pages.

5. Names of the students, advisor, and/or institution **must not** appear on any page of the solution. The solution file **must not** contain any identifying information other than the team Control Number.

6. STOP making any changes to the solution at **8:00pm EST on Monday, February 20, 2023** .

比赛期间——准备解决方案文件

1、MCM/ICM 解决方案被评判为成功完成比赛的不同程度（从成功参与者到杰出）。没有通过或截止分数，因此，部分解决方案是可以接受的， 并且鼓励团队尽可能多地完成问题。MCM/ICM 评委主要对团队的思维过程、问题分析、建模方法和数学方法感兴趣。

2、团队必须在一个 Adobe PDF 电子文件中提交他们的整个解决方案，其中包括书面文本、图形、图表和支持材料。论文必须用英文打字，至少有 12 号字体的可读字体。不要发送额外的 "非解决方案"文件，例如数据或计算机程序。

3、解决方案的每一页都必须包含团队控制号和页面顶部的页码。在每页上使用页眉，例如：团队编号 2312345，第 6 页，共 25 页。

4、您的解决方案报告应以摘要表开头，然后是团队的解决方案。确保您的解决方案满足 25 页的限制要求。鼓励使用目录并计入页数限制。参考列表（或参考书目）、注释页和任何附录现在都计入页数限制，应包含在解决方案页之后。

5、学生、顾问和/或机构的姓名不得出现在解决方案的任何页面上。解决方案文件不得包含除团队控制编号之外的任何识别信息。

6、在美国东部时间 2023 年 2 月 20 日星期一晚上 8 点 ．停止对位于的解决方案进行任何更改。

During the Contest – Advisor Activities

1. After the contest begins at 5 p.m. EST on Thursday February 16, 2023, and while the teams are preparing their solutions, the advisor should login to the contest web site at **/undergraduate/contests/mcm** . Click on **Advisor Login** , and then enter your email address and password.
2. For each control number, if you have not done so already, enter the team member names and confirm that each name is spelled correctly. The order of the student names has no bearing or importance on participation. In the eyes of COMAP and the contest directors,all team members are equal. **This determines how the names will appear on the contest certificates. COMAP will not make any changes or reprint certificates for any reason.**
3. Specify the problem that each team has chosen to solve.
4. **Click here to download the Microsoft Word Summary Sheet** or **Click here to download the LaTeX Summary Sheet.** (This should be used as the first page of each team's electronic email submission.)

比赛期间——顾问活动

1、竞赛于美国东部时间 2023 年 2 月 16 日(星期四)下午 5 点开始，在参赛队准备解决方案时，顾问应登录竞赛网站：/undergraduate/contests/mcm．点击顾问登录，然后输入您的电子邮件地址和密码。

2、对于每个控制编号，如果您尚未这样做，请输入团队成员姓名并确认每个姓名拼写正确。学生姓名的顺序对参与没有影响或重要性。在 COMAP 和竞赛负责人的眼中，所有团队成员都是平等的。这决定了名称将如何出现在比赛证书上。COMAP 不会以任何理由对证书进行任何更改或重印。

3、指定每个团队选择解决的问题。

4、单击此处下载 Microsoft Word 摘要表或单击此处下载 LaTeX 摘要表。（这应该用作每个团队提交电子邮件的第一页。

After the Contest - Submitting a Solution Document

1. Teams must end all work on their solution by **8:00 p.m. EST on Monday February 20, 2023** and send an **Adobe PDF** electronic file of Solution Paper by email to COMAP by **9:00 p.m. EST on Monday, February 20, 2023.** *Note: Do not wait until the last minute. Send solution as soon as it is completed .

2. No further modifications, enhancements, additions, or improvements may be made to the team's solution paper after 8 p.m. EST on February 20, 2023. Any changes to the solution will constitute a violation of the contest rules and may result in disqualification.

3. Each team is required to submit an Adobe PDF electronic copy of its solution by email to **solutions@comap.com** . Any team member or the advisor may submit this email.
   a. Your email with your electronic PDF solution file **MUST** be received at COMAP on or before the email submission deadline of **9:00 p.m. EST on February 20, 2023** .
   b. In the subject line of your email write your team's control number. For example, **Subject: 2312345** . Limit one team solution file per email.
   c. Use your team's control number as the name of your file attachment. For example: **2312345.pdf.** *Note: The attachment must be less than 17MB. Do not use a cloud service such as Google Docs. Your email must contain an Adobe PDF attachment.
   d. Page 1 of the team's PDF electronic solution should be the team summary, followed by the solution and any references and appendices.
   e. Do not include or send programs, software, databases, and/or other files with your solution email, as they will not be used in the judging process.
   f. **The names of the students, advisor, or institution should NOT appear on any page of the electronic solution.**
   g. COMAP will accept only an **Adobe PDF** of your solution. Limit one solution per email.

4. Failure by a team to submit a solution via email by **9:00 p.m. EST on February 20, 2023** in accordance with the above instructions may result in disqualification or reduction of award level.

比赛结束后 – 提交解决方案文件

1、团队必须在以下时间之前结束其解决方案的所有工作美国东部时间 2023 年 2 月 20 日星期一晚上 8 点并发送一个文件导出通过电子邮件将解决方案文件的电子文件发送给 COMAP 美国东部时间 2023 年 2 月 20 日星期一晚上 9 点.*注意:不要等到最后一刻.完成后立即发送解决方案。

2、在美国东部时间 2023 年 2 月 20 日晚上 8 点之后，不得对团队的解决方案文件进行进一步的修改、增强、添加或改进. 对解决方案的任何改变都将构成对比赛规则的违反，并可能导致取消资格。

3、每个团队需要通过电子邮件向以下地址提交其解决方案的 Adobe PDF 电子副本 solutions@comap.com. 任何团队成员或顾问都可以提交此电子邮件。

a. 您的电子邮件和您的电子 PDF 解决方案文件必须在电子邮件提交截止日期或之前送达 COMAP 美国东部时间 2023 年 2 月 20 日晚上 9 点。

b. 在邮件的主题行写下你团队的控制号. 举个例子，主题:2312345. 每封电子邮件仅限一个团队解决方案文件。

c. 使用您团队的控制编号作为文件附件的名称. 例如:2312345.pdf.*注意:附件必须小于 17MB. 不要使用云服务，如谷歌文档. 您的电子邮件必须包含 Adobe PDF 附件.

d. 团队 PDF 电子解决方案的第一页应该是团队总结，然后是解决方案以及任何参考资料和附录。

e. 不要在您的解决方案电子邮件中包含或发送程序、软件、数据库和/或其他文件，因为它们不会在评审过程中使用。

f. 学生、导师或机构的名字不应出现在电子解决方案的任何页面上。

g. COMAP 将只接受文件导出你的解决方案. 每封邮件仅限一个解决方案。

4、团队未能通过电子邮件提交解决方案美国东部时间 2023 年 2 月 20 日晚上 9 点按照上述说明可能会导致取消资格或降低奖励等级。

NOTE: By submitting a MCM/ICM contest entry document , team members agree that:
• Their submission and all rights to its publication become the property of COMAP, Inc.
• COMAP may use, edit, excerpt, and publish this submission for promotional use or any other purpose, including placing it online, distributing it electronically, or publishing it in The UMAP Journal or otherwise, without compensation of any kind.
• COMAP reserves the right to use in materials relating to this contest, the names of the team members, their advisor(s), and their affiliations, without further notification, permission, or compensation.
• All images, figures, photographs, tables, and drawings in a team's submission were either created by the team, or, if reproduced or obtained from another source, the submission cites a specific reference for each at its location in the submission.

• All direct quotations in the submission are enclosed in quotation marks or otherwise identified as such, with a specific reference cited for each at its location in the submission.

注意：通过提交 MCM/ICM 竞赛参赛文件，团队成员同意：

● 他们的提交及其出版物的所有权利成为 COMAP，Inc. 的财产。

COMAP 可以使用、编辑、摘录和发布此提交用于促销用途或任何其他目的，包括在线发布、以电子方式分发或在 UMAP 期刊或其他方式上发布，无需任何形式的补偿。

● COMAP 保留在与本次比赛有关的材料中使用团队成员姓名、他们的顾问及其隶属关系的权利，无需进一步通知、许可或补偿。

● 团队提交的所有图像、数字、照片、表格和绘图要么由团队创建，要么如果复制或从其他来源获得，则提交在提交的位置引用每个特定参考。

● 提交文件中的所有直接引用都用引号括起来或以其他方式标识，并在提交文件的位置为每个引用引用特定的参考。

After the Contest – Advisor Actions

1. Advisors should use the **Advisor Login** link one to two days after the contest has closed to verify COMAP received your team's electronic solution. In most cases, COMAP will have solution status of all papers posted 24-48 hours after the contest window ends.
2. Look for contest results in mid May 2023. Visit the contest web site regularly and follow COMAP on @COMAPMath on Twitter or COMAPCHINAOFFICIAL on Weibo for updates. COMAP will post the contest results on the web site as soon as they are available. It takes several weeks for the judges to evaluate the solutions and for COMAP to process the results. Please do not call or email COMAP regarding contest results.

赛后 - 顾问行动

1、 顾问应在比赛结束后一到两天使用顾问登录链接来验证 COMAP 是否收到了您团队的电子解决方案。在大多数情况下， COMAP 将在竞赛窗口结束后 24-48 小时发布所有论文的解决方案状态。

2、查看 2023 年 5 月中旬的比赛结果．请定期访问大赛网站，并通过 Twitter 上的@COMAPMath 或微博上的 COMAPCHINAOFFICIAL 关注 COMAP 的最新动态．COMAP

将尽快在网站上公布竞赛结果. 评委需要几周时间来评估解决方案，COMAP 需要几周时间来处理结果. 请不要打电话或发邮件给 COMAP 询问比赛结果。

VII. MCM/ICM Results and Recognition

1. Judging will be completed in March-May and the results will be posted on or before May 31, 2023. Levels of awards for successful submissions are Successful Participant, Honorable Mention, Meritorious, Finalist, or Outstanding Winner. Submission found to have rule or procedure violations, or problem solution issues may be designated as Disqualified or Unsuccessful. **Click here to view descriptions of the contest designations** .

2. COMAP will prepare news releases for local and national dissemination, and professional publications will announce results.

3. Every team that successfully submits a solution paper will be awarded a certificate of participation. **Click here to download MCM/ICM certificates** .

4. Select teams will have all or portions of their solution papers published in COMAP's UMAP Journal.

七. MCM/ICM 结果和认可

1、评审将于 3 月至 5 月完成，结果将于 2023 年 5 月 31 日或之前公布. 成功提交的奖项级别为成功参与者、荣誉奖、功勋奖、决赛入围者或杰出获奖者。提交被发现有违反规则或程序，或问题解决问题可能被指定为不合格或不成功。单击此处查看比赛名称的说明。

2、COMAP 将为地方和全国传播准备新闻稿，专业刊物将公布结果。

3、每个成功提交解决方案论文的团队都将获得参与证书。单击此处下载 MCM/ICM 证书。

4、选定的团队将在 COMAP 的 UMAP 期刊上发表全部或部分解决方案论文。

VIII. MCM/ICM Awards and Prizes

The International COMAP Scholarship Award will be awarded to the four(4) top MCM/ICM teams from any of the participating

countries; $9000 being split among the team members and $1000 to the school represented. Awards will be announced on or before May 31st each year.

After the results are issued, each successfully participating team advisor and student will receive a certificate of participation. You may login to the contest web site using the **Advisor Login** link to view and print your team's certificates. **Click here to download MCM/ICM certificates.**

- **MCM Awards (Problem A, B and C)**
- The Ben Fusaro Award will be accorded to an especially creative paper and will be chosen from the contest finalists.
- The Frank R. Giordano Award began in 2012. It honors Brig. Gen. (ret) Frank Giordano who directed the MCM for 20 years. This award goes to a paper that demonstrates true excellence in the execution of the modeling process.
- **ICM Awards (Problem D, E and F)**
- The Leonhard Euler Award is presented to a team selected by the head judge of the ICM's Problem D. The criteria are: 1) a paper in the Meritorious/Finalist/Outstanding rating; 2) contains especially creative and innovative modeling; and 3) shows good understanding of interdisciplinary science. The award honors the name of a 18th-century Swiss applied mathematician, who was known for the breadth of his research applications, volume of written work, excellent teaching, and interdisciplinarity.
- The Rachel Carson Award honors an American conservationist whose book "Silent Spring" initiated the global environmental movement and whose work spanned many disciplines concerned with the local and global environments. This award is presented to a team selected by the Head Judge of ICM Problem E for excellence in using scientific theory and data in its modeling.
- Vilfredo Pareto was an Italian scholar, modeler and problem solver, who at various times was an engineer, sociologist, economist, political scientist, mathematician, and philosopher. He lived and worked in the late 19th and early 20th centuries. The ICM Pareto Award for outstanding modeling in the Policy Modeling problem (ICM Problem F) honors the work and legacy of this famous social science problem solver. In particular for this award, the head judge seeks to highlight a paper that best models the more dynamic and challenging contextual human elements that make simplification or refinement of policy models so difficult.

The Institute for Operations Research and the Management Sciences (INFORMS) is the largest society in the world for professionals in the

field of operations research (OR), management science (MS), and analytics. INFORMS has long recognized the importance of involving undergraduate students and faculty in an unscripted process of mathematical modeling whose problems contain many of the modern elements seen by its membership. The MCM/ICM exemplifies these characteristics. Consequently, INFORMS has been an active supporter of the MCM/ICM since its inception.

INFORMS carefully selects and designates a single Outstanding team from each of the six problems - A, B, C, D, E, F - as an INFORMS Outstanding winning team whose modeling and analyses best exemplify the style and content reflected in its membership's professional practice. Each student receives a letter of congratulations from the current INFORMS President and a complimentary one-year INFORMS student membership. Each associated faculty advisor receives a letter of congratulations and appreciation from the current INFORMS President, along with complimentary one-year access to the full suite of award-winning INFORMS journals.

The Society for Industrial and Applied Mathematics (SIAM) will designate six teams, one each for problems A, B, C, D, E, and F from the MCM/ICM as an SIAM winner.

The Mathematical Association of America (MAA) will designate up to six teams, at most one each for problems A, B, C, D, E, and F from the MCM/ICM as an MAA winner.

The American Statistical Association (ASA) will designate one Outstanding team from MCM Problem C as a ASA winner.

The American Mathematical Society (AMS) will designate six teams, one each for problems A, B, C, D, E, and F from the MCM/ICM as an AMS winner.

八. MCM/ICM 奖项和奖品

国际 COMAP 奖学金将授予来自任何参赛国家的四个顶级 MCM/ICM 团队；9000 美元在团队成员中平分，1000 美元给所代表的学校. 奖项将于每年 5 月 31 日或之前公布。

结果公布后，每位成功参与的团队顾问和学生将获得一份参与证书. 您可以使用登录竞赛网站顾问登录联系查看并打印您团队的证书. 单击此处下载 MCM/ICM 证书.

- MCM 奖（问题 A、B 和 C）
- Ben Fusaro 奖将授予一篇特别有创意的论文，并将从竞赛决赛入围者中选出。
- Frank R. Giordano 奖始于 2012 年。它授予双桅船。指挥 MCM 20 年的将军

（退役）Frank Giordano。该奖项授予在建模过程执行方面表现出真正卓越的论文。

- ICM 奖（问题 D、E 和 F）
- 莱昂哈德·欧拉奖颁发给由 ICM 问题 D 的首席评委选出的团队。标准是：1）论文在 Meritorious/Finalist/Outstanding 评级；2）包含特别有创意和创新的造型；3）表现出对跨学科科学的良好理解。该奖项旨在表彰 18

世纪瑞士应用数学家的名字，他以其研究应用的广度、书面作品的数量、出色的教学和跨学科性而闻名。

● 雷切尔·卡森奖旨在表彰一位美国环保主义者，他的著作《寂静的春天》发起了全球环境运动，其工作涉及与当地和全球环境有关的许多学科。该奖项颁发给由 ICM 问题 E 的首席评委挑选的团队，该团队在建模中使用科学理论和数据方面表现出色。

● Vilfredo Pareto 是一位意大利学者、建模师和问题解决者，曾在不同时期担任工程师、社会学家、经济学家、政治学家、数学家和哲学家。他在 19 世纪末和 20 世纪初生活和工作。政策建模问题（ICM 问题 F）中杰出建模的 ICM 帕累托奖旨在表彰这位著名的社会科学问题解决者的工作和遗产。特别是对于这个奖项， 首席评委试图强调一篇论文，该论文最好地模拟了更具动态性和挑战性的上下文人为因素，这些因素使得政策模型的简化或改进变得如此困难。

运筹学与管理科学研究所（INFORMS）是世界上最大的运筹学（OR）、管理科学（MS）和分析领域专业人士协会。INFORMS 长期以来一直认识到让本科生和教职员工参与一个无脚本的数学建模过程的重要性，该过程的问题包含其成员所看到的许多现代元素。MCM/ICM 就是这些特性的例证。因此，INFORMS 自成立以来一直是 MCM/ICM 的积极支持者。

INFORMS 从 A、B、C、D、E、F 六个问题中的每一个中精心挑选并指定一个杰出团队作为 INFORMS 杰出获奖团队，其建模和分析最能体现其会员专业实践中所反映的风格和内容. 每个学生都会收到现任 INFORMS 主席的祝贺信和免费的一年 INFORMS 学生会员资格。每位相关的教职顾问都会收到现任 INFORMS 主席的祝贺和感谢信，并免费获得一年的全套获奖 INFORMS 期刊。

工业与应用数学协会（SIAM）将指定六支队伍，分别来自 MCM/ICM 的问题 A、B、C、D、E 和 F，作为 SIAM 获胜者。

美国数学协会（MAA）将指定最多六支队伍，最多一支队伍，分别负责 MCM/ICM 的问题 A、B、C、D、E 和 F，作为 MAA 获胜者

美国统计协会（ASA）将指定 MCM 问题 C 中的一支杰出团队作为 ASA 获胜者。

美国数学会（AMS）将指定六支队伍，分别负责 MCM/ICM 的问题 A、B、C、D、E 和 F，作为 AMS 获胜者。

IX. Judging Results and Designations

What are the differences between the designations?

Not Judged - The solution was not submitted correctly. Some examples include damaged or corrupted file, file sent in the wrong format, or not submitting your solution as outlined in the instructions.

Disqualified - The team's report was found to be in violation of the contest rules.

> **Disqualified** – **P**lagiarism: The solution paper had undocumented sources, verbatim text, or information lifted from the Internet, and/or was very similar to other papers submitted as determined by judges and/or our pairwise comparison software. All information, ideas,

data, algorithms, etc. from outside sources used by team members must have the original source documented and properly referenced. Our pairwise comparison software identifies papers and/or parts of papers as similar to, or exactly the same as, other papers submitted.

Disqualified – **W** eb: COMAP identified the solution paper, or portions of the solution paper as shared or posted, or a team member (or members) were found to have received assistance through interactive web sites or electronic media. Posting or sharing all, or any part of the problem statement, your solution, or partial solution anywhere during the contest weekend is strictly prohibited. Obtaining all, or any part, of anyone else's solution is also prohibited. Contest rules prohibit seeking assistance outside of team members or obtaining help from human sourcesâ€"in person or via any medium. COMAP continually monitors the Internet during the contest period.

Unsuccessful Participant - The team's report did not adequately respond to the requirements of the contest problem or a team (or team member) was found to have visited Internet sites discussing the contest problem during the contest period.

Unsuccessful Participant – **W** eb: A team member (or members) visited websites or social media where contest problems were being openly discussed. Contest rules prohibit seeking assistance outside of team members or obtaining help from human sourcesâ€"in person or via any medium. COMAP is continually monitoring the Internet during the contest period to include websites and social media where contest solutions are being openly discussed.

Unsuccessful Participant – **I** ncomplete: The solution paper was found to be significantly incomplete and did not show any serious effort in adequately responding to the contest problem or its requirements.

Successful Participant - The team made a concerted effort to respond to the contest problem and submit a solution report. The report, however, had incomplete responses to all or some requirements, and/or showed some deficiencies or weakness in the modeling processes, analysis, conclusions, and/or communication.

Honorable Mention - The team's solution report indicated an above average effort in addressing all problem requirements, and contained elements that were judged to show sound and supported processes in modeling and problem solving, analysis, conclusions, and communication of results.

Meritorious - The team's solution report was excellent in many aspects of modeling and problem solving, analysis, conclusions, and communication. The report addressed all requirements in a clear, well-supported, well-organized, and well-presented manner.

Finalist - The designation Finalist recognizes teams whose solution reports are exemplary and therefore reached the final round of judging. These papers present complete and logical analysis in an organized and clear presentation above and beyond simply addressing the requirements. These papers are easy to read, easy to follow, logical, and comprehensive. Finalist papers are among the best of all team submissions.

Outstanding Winner - The designation Outstanding recognizes teams whose solution reports are determined, in the final round of judging, to be the "best of the best." These teams' reports are at the highest level relative to the contest submissions in terms of exemplary student work in modeling and problem solving, analysis, and communication. COMAP may publish and use all or part of these submissions as examples of outstanding student work.

九. 评判结果和指定

名称之间有什么区别？

未评判– 未正确提交解决方案。一些示例包括损坏或损坏的文件、以错误格式发送的文件或未按照说明中所述提交您的解决方案。

取消资格– 团队的报告被发现违反了比赛规则。

不合格-剽窃：该解决方案论文有无证来源、逐字文本或从互联网上获取的信息，和/或与评委和/或我们的成对比较软件确定的其他论文非常相似。团队成员使用的来自外部来源的所有信息、想法、数据、算法等都必须记录原始来源并正确引用。我们的成对比较软件将论文和／或部分论文识别为与其他提交的论文相似或完全相同。

不合格－网络： COMAP 将解决方案文件或解决方案文件的某些部分确定为共享或张贴，或发现团队成员（或多个成员）通过交互式网站或电子媒体获得了帮助。

严禁在比赛周末期间的任何地方张贴或分享问题陈述、您的解决方案或部分解决方案的全部或任何部分。也禁止获取任何其他人的解决方案的全部或任何部分。竞赛规则禁止在团队成员之外寻求帮助或从人力资源获得帮助——亲自或通过任何媒介。COMAP 在比赛期间持续监控互联网。

不成功的参与者- 团队的报告没有充分响应比赛问题的要求，或者发现团队（或团队成员）在比赛期间访问了讨论比赛问题的互联网站点。

不成功的参与者 - 网络：团队成员（或成员）访问了公开讨论竞赛问题的网站或社交媒体。竞赛规则禁止在团队成员之外寻求帮助或从人力资源获得帮助——亲自或通过任何媒介。COMAP 在比赛期间持续监控互联网， 包括公开讨论比赛解决方案的网站和社交媒体。

不成功的参与者-不完整：发现解决方案文件明显不完整，并且没有表现出任何认真的努力来充分回应比赛问题或其要求。

成功参赛者- 团队齐心协力应对比赛问题并提交解决方案报告。然而，该报告对所有或部分要求的响应不完整，和/或在建模过程、分析、结论和/或沟通中显示出一些缺陷或弱点。

荣誉奖- 团队的解决方案报告表明在解决所有问题要求方面付出了高于平均水平的努力，并且包含的元素被认为在建模和问题解决、分析、结论和结果交流方面表现出良好和支持的过程。

Meritorious – 团队的解决方案报告在建模和问题解决、分析、结论和沟通的许多方面都很出色。该报告以清晰、得到充分支持、组织良好和呈现良好的方式解决了所有要求。

决赛选手- 决赛选手的称号旨在表彰其解决方案报告堪称典范并因此进入最后一轮评审的团队。这些论文以有条理和清晰的介绍形式提供了完整和合乎逻辑的分析，超越了简单地解决需求。这些论文易于阅读、易于理解、逻辑性强、内容全面。入围论文是所有团队提交的最佳论文之一。

杰出优胜者- 杰出称号旨在表彰其解决方案报告在最后一轮评审中被确定为"最佳中的最佳"的团队。这些团队的报告在建模和解决问题、分析和交流方面的示范学生工作方面相对于比赛提交的报告处于最高水平。COMAP 可能会发布和使用这些提交的全部或部分作为优秀学生作品的示例。