2026 ICM

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Problem F: To Gen-AI, or Not To Gen-AI (or how to Gen-AI)? That is the Question!

题目 F：用还是不用生成式 AI（或如何使用生成式 AI）？这是个问题！

In just a few years, Generative Artificial Intelligence (Gen-AI) has gone from a tool of limited capacity, only used by a few early-adopters to a powerful and inescapable resource embedded in our daily lives. Over time, research suggests that Gen-AI could impact the future of work. For example, in some fields, Gen-AI may replace humans (or heavily reduce the human workload), while other fields might not be heavily impacted or might even grow.

仅在短短数年间，生成式人工智能（Gen-AI）就从一种能力有限、仅被少数先行者使用的工具，演变为嵌入日常生活的强大且难以回避的资源。随着时间推移，研究表明 Gen-AI 可能影响未来的工作形态。例如，在某些领域，Gen-AI 可能取代人类（或大幅减少人类工作量）；而在另一些领域，影响可能不大，甚至可能促进该领域增长。

In this question, you will explore how post-secondary educational institutions, of various types, should best prepare their future graduates in light of this new technology. Specifically, you are asking do to the following.

在本题中，你将探讨不同类型的高等教育后阶段（post-secondary）机构应如何在这一新技术背景下更好地培养未来毕业生。具体而言，你需要完成以下任务。

- Choose three careers, one from each of the following categories:
- 选择三种职业，每类各选一种：

STEM career: people in this career often have at least a four year university degree in the sciences, engineering, or mathematics;
Trade career: people in this career often have training from a trade school and/or an apprenticeship program, such as chef, plumber, and electrician;
Arts career: people in this career often have studied at an arts school, conservatory, or cultural center, such as musician, dancer, or painter.

STEM 职业：从业者通常至少拥有科学、工程或数学方向的四年制大学学位；
技工/职业技能类职业（Trade career）：从业者通常接受职业学校培训和/或学徒制训练，例如厨师、水管工、电工；
艺术类职业（Arts career）：从业者通常曾在艺术学校、音乐学院/艺术学院（conservatory）或文化中心学习，例如音乐家、舞者或画家。

- Design a data-informed model to explore the future of each of your three chosen professions, given the current trajectory and expected impacts of Gen-AI. Be sure to identify your data sources as well as your reasoning behind any drivers that you expect to change this profession as a result of Gen-AI. Note: you may leverage existing research on the future of work, but be sure to cite your sources and explain how you are using the established research to inform your analysis.
- 设计一个数据驱动（data-informed）的模型，基于 Gen-AI 的当前发展轨迹及其预期影响，分析你所选三种职业的未来走向。请明确你的数据来源，并阐述你所认为会因 Gen-AI 而改变该职业的关键驱动因素及其理由。注：你可以利用关于未来工作的现有研究，但务必规范引用来源，并解释你如何使用这些既有研究来支撑你的分析。
- Identify a specific post-secondary institution and program of study for each career you are analyzing (one at a university, one at a trade school, one at an arts school), and focus your recommendations accordingly. In other words, you should have three sets of recommendations that address the following question: Based on your analysis, how would you advise the leaders of each of these institutions to address Gen-AI in the programs specific to the careers you are analyzing?

- 针对你分析的每一种职业，分别选定一个具体的高等教育后阶段机构及其对应的学习项目/专业（一个在大学、一个在职业学校、一个在艺术学校），并据此聚焦你的建议。换言之，你需要提出三套建议，回答以下问题：基于你的分析，你会如何建议这些机构的领导者在与你所分析职业相关的培养项目中应对 Gen-AI?

Below are just some thoughts you may wish to consider; teams should not attempt to address all of these ideas, but should use these as inspiration that will lead to a cogent and thorough analysis that should vary team to team.

以下仅为一些可供考虑的思路；各队不应试图面面俱到，而应将其作为启发，形成连贯且充分的分析（不同队伍的分析应有所差异）。

Should the program of study grow or shrink (graduate more or fewer people) as a result of changes in the career due to Gen-AI? If the field should grow, how might the institution recruit more people; and if the field should shrink, are there other programs in the school that should grow to absorb the people who used to study in this program?

随着 Gen-AI 导致职业发生变化，相关培养项目规模应扩大还是缩小（毕业人数更多或更少）？若该领域应扩大，学校如何招募更多学生；若该领域应缩小，学校是否应扩大其他项目以吸纳原本会就读该项目的学生？

What should these three different programs of study teach about Gen-AI? Many post-secondary institutions of learning have asked this question and are still developing their response. While some institutions have outright banned the use of AI on any assignments, others have brought the use of AI to the forefront of their curriculum. Some schools aim to produce experts who can contribute to the leading edge of the technological field, while some focus on graduating students in non-technical fields who are fluent users of the technology. Some institutions encourage their students to think about all the ways they can apply this new technology, and some schools challenge students to carefully weigh the benefits and costs of using AI, given the requisite energy usage, water demands, and risk of insufficient (often missing or incorrect) attribution to the original creators of ideas or content. For the three programs of study at the three institutions you've selected, what do you recommend to best support the employability of their graduates? Be sure to support your recommendations with the results of a mathematical model.

这三类不同的培养项目应当教授哪些与 Gen-AI 相关的内容？许多高等教育后阶段机构都提出了这一问题，并仍在形成回应。有些机构直接禁止在任何作业中使用 AI；另一些则将 AI 使用置于课程体系的核心。有的学校旨在培养能够推动技术前沿发展的专家；也有学校侧重于培养非技术领域但能熟练使用该技术的毕业生。有些机构鼓励学生思考可将新技术应用到哪些方面；也有学校要求学生在考虑 AI 所需能耗、水资源需求，以及对原创思想或内容创作者的署名/归因不足（常见为缺失或不准确）风险的前提下，审慎权衡使用 AI 的收益与成本。针对你所选三所机构的三项培养项目，你建议如何做才能最有效地提升毕业生的可就业性？务必用数学模型的结果来支撑你的建议。

While this problem poses the question through the context of employability of graduates in a world where Gen-AI is ubiquitous, perhaps employment demands are not the only way to measure the success of the institutional policies you are proposing. What other factors do you believe should be considered, and how do your models and recommendations change when you consider these other factors?

尽管本题以"在 Gen-AI 无处不在的世界中毕业生的可就业性"为背景提出问题，但就业需求也许并非衡量你所提出机构政策成败的唯一标准。你认为还应考虑哪些因素？当你将这些因素纳入考量时，你的模型与建议将如何变化？

If you believe your specific recommendations can be generalized beyond one institution and/or beyond one program, be sure to explain the extent of the generalization and justify this.

如果你认为你的具体建议可以推广到某一所机构之外和/或某一个项目之外，请明确说明可推广的范围，并给出论证理由。

Your PDF solution of no more than 25 total pages should include:

你的 PDF 解答总页数不超过 25 页，应包括：

One-page Summary Sheet.
Table of Contents.
- Your complete solution.

- References list.
AI Use Report (If used does not count toward the 25-page limit.)

1 页摘要页（Summary Sheet）。
目录。
- 完整解答。
- 参考文献列表。
AI 使用报告（如使用；不计入 25 页总页数限制。）

Note: There is no specific required minimum page length for a complete ICM submission. You may use up to 25 total pages for all your solution work and any additional information you want to include (for example: drawings, diagrams, calculations, tables). Partial solutions are accepted. We permit the careful use of AI such as ChatGPT, although it is not necessary to create a solution to this problem. If you choose to utilize a generative AI, you must follow the COMAP AI use policy. This will result in an additional AI use report that you must add to the end of your PDF solution file and does not count toward the 25 total page limit for your solution.

注：完整的 ICM 提交稿没有规定最低页数要求。你的全部解题内容及任何补充信息（例如：图示、示意图、计算、表格）最多可使用 25 页。允许提交部分解答。竞赛允许谨慎使用 ChatGPT 等 AI 工具，但完成本题并不依赖 AI。如你选择使用生成式 AI，必须遵循 COMAP 的 AI 使用政策；这将要求你在 PDF 解答文件末尾附加一份 AI 使用报告，该报告不计入 25 页总页数限制。