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2016 ICM Problem F Modeling Refugee Immigration Policies 难民移民政策建模

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2016 ICM Problem F Modeling Refugee Immigration Policies 难民移民政策建模

- With hundreds of thousands of refugees moving across Europe and more arriving each day, considerable attention has been given to refugee integration policies and practices in many countries and regions. History has shown us that mass fleeing of populations occur as a result of major political and social unrest and warfare. These crises bring a set of unique challenges that must be managed carefully through effective policies. Events in the Middle East have caused a massive surge of refugees emigrating from the Middle East into safe haven countries in Europe and parts of Asia, often moving through the Mediterranean and into countries such as Turkey, Hungary, Germany, France, and UK.
- 欧洲各地流动着成千上万的难民，并且每天还有更多难民抵达，这种情况下，许多国家和地区都极度关注对难民的接收政策和举措。历史告诉我们，大规模人口外逃是由重要政治、社会动荡和战争造成的。这些危机带来了一系列独特的挑战，必须通过有效的政策来谨慎应对。中东发生的事件导致大量难民从中东移民到欧洲和亚洲部分安全的国家，通常是通过地中海进入土耳其、匈牙利、德国、法国和英国等国家。

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- By the end of October 2015, European countries had received over 715,000 asylum applications from refugees. Hungary topped the charts with nearly 1,450 applications per 100,000 inhabitants, but with only a small percentage of those requests granted (32% in 2014), leaving close to a thousand refugees homeless per every 100K residents of the country. Europe has established a quota system where each country has agreed to take in a particular number of refugees, with the majority of the resettlement burden lying with France and Germany.
- 截至2015年10月底，欧洲国家共收到超过71.5万份难民庇护申请。匈牙利以每10万居民就有将近1450份庇护申请位居榜首，但只有一小部分申请获得批准（2014年为32%），每10万居民中就有近千名难民无家可归。欧洲已经建立了配额制，每个国家愿意接收特定数量的难民，其中大部分安置难民的负担由法国和德国承担。

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- The refugees travel multiple routes – from the Middle East through (1) West Mediterranean, (2) Central Mediterranean, (3) Eastern Mediterranean, (4) West Balkans, (5) Eastern Borders, and (6) Albania to Greece (See these routes mapped out in http://www.bbc.com/news/world-europe-34131911). Each route has different levels of safety and accessibility, with the most popular route being Eastern Mediterranean and the most dangerous, Central Mediterranean.
- 难民从中东出发，有多条路线可选：（1）西地中海，（2）地中海中部，（3）地中海东部，（4）西巴尔干半岛，（5）东部边界，（6）阿尔巴尼亚到希腊（见http://www.bbc.com/news/world-europe-34131911）。每条路线都有不同程度的安全性和可行性，最受欢迎的路线是地中海东部，最危险的路线是地中海中部。

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- Countries that have been burdened the most are concerned about their capacity to provide resources for the refugees such as food, water, shelter, and healthcare. There are numerous factors that determine how the refugees decide to move through the region. Transportation availability, safety of routes and access to basic needs at destination are considered by each individual or family in this enormous migration.
- 国家负担的重点是其为难民提供粮食、水、住房和保健等资源的能力。有许多因素决定了难民如何经过该地区。在这个巨大的迁移过程中，每个个人和家庭都应考虑他们移民能否成功、路线是否安全以及在目的地能否获得基本需求这些问题。

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- The UN has asked your team, the ICM-RUN (RefUgee aNalytics) to help develop a better understanding of the factors involved with facilitating the movement of refugees from their countries of origin into safe-haven countries.
- 联合国要求移民和难民委员会（难民局）就能促进难民从其原籍国进入避难国家的因素建立一个好的协议 。

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- Your Specific Tasks:
- 1. Metrics of refugee crises. Determine the specific factors which can either enable or inhibit the safe and efficient movement of refugees.
- 你们的具体任务：
- 1. 确定难民危机指标。确定能够促进或抑制难民流动安全性和有效性的具体因素。

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- There are attributes of the individuals themselves, the routes they must take, the types of transportation, the countries' capacity, including number of entry points and resources available to refugee population. This first task requires ICM-RUN to develop a set of measures and parameters and justify why they should be included in the analysis of this crisis.
- 例如个人本身因素、必须走的路线、交通类型、国家的能力，包括入境点的数目和可供给难民的物资等。第一项任务要求你们制定一套评价方法和参数，并说明危机进行分析中为什么要用它们

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- 2. Flow of refugees. Create a model of optimal refugee movement that would incorporate projected flows of refugees across the six travel routes mentioned in the problem, with consideration of transportation routes/accessibility, safety of route and countries' resource capacities. You can include different routes, different entry points, single or multiple entry points, and even different countries.
- 2. 建立难民流动模型。创建一个最佳难民流动模型来预测在问题中提到的六条路线上的难民流动情况，同时考虑到交通路线及其可行性、路线安全性和各国资源能力。你们可以考虑不同的路线，不同的入境点，单一或多个入境点，甚至不同的国家。

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- Use the metrics that you established in Task 1 to determine the number of refugees, as well as the rate and point of entry necessary to accommodate their movement. Be sure to justify any new elements you have added to the migration and explain the sensitivities of your model to these dynamics.
- 用您在任务1中确定的指标来确定难民的数量，以及适应他们移动所需的速率和入境点。一定要解释您在难民流动模型中用到的任何新指标，并解释模型对这些指标变化的敏感性。

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- 3. Dynamics of the crisis. Refugee conditions can change rapidly. Refugees seek basic necessities for themselves and their families in the midst of continuously changing political and cultural landscapes. In addition, the capacity to house, protect, and feed this moving population is dynamic in that the most desired destinations will reach maximum capacity the quickest, creating a cascade effect altering the parameters for the patterns of movement. Identify the environmental factors that change over time; and show how capacity can be incorporated into the model to account for these dynamic elements.
- 3. 危机的变化。难民的状况可能迅速改变。难民在不断变化的政治和文化环境中为自己及其家庭寻求基本生活的保障。此外，为流动人口提供住房、保护和食物的能力是动态变化的，因为最受期待的目的地将最快地达到最大容量，从而产生级联效应，改变流动模型的参数。确定随着时间的推移而变化的环境因素；并说明如何将容量纳入模型以考虑这些动态因素。

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- What resources can be prepositioned and how should they be allocated in light of these dynamics? What resources need priority and how do you incorporate resource availability and flow in your model? Consider the role and resources of both government and non-government agencies (NGOs). How does the inclusion of NGO's change your model and strategy? Also consider the inclusion of other refugee destinations such as Canada, China, and the United States. Does your model work for these regions as well?
- 哪些资源可以预先配置?根据这些动态因素应该如何分配资源?哪些资源需要优先考虑，以及如何在模型中整合资源可用性和流动性?考虑政府和非政府机构(NGO)的作用和资源。NGO加入后如何修改你的模型和策略?还可以考虑其他难民流动的目的地，如加拿大、中国和美国。你的模型也适用于这些地区吗?

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- 4. Policy to support refugee model. Now that you have a working model, ICM-RUN has been asked to attend a policy strategy meeting where your team is asked to write a report on your model and propose a set of policies that will support the optimal set of conditions ensuring the optimal migration pattern.
- 4.支持难民模型的政策。现在你们有了一个工作模型，并将参加一个政策战略会议，要求你们写一份关于该模型的报告，并提出一套政策，以创建最优的条件，确保最优的迁移模式。

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- Your UN commission has asked you to consider and prioritize the health and safety of refugees and of the local populations. You can include as many parameters and considerations as you see fit to help to inform the strategic policy plan, keeping in mind the laws and cultural constraints of the effected countries. Consider also the role and actions of nongovernmental organizations (NGOs).
- 你的联合国委员会要求你考虑并优先考虑难民和当地居民的健康和安全。考虑到受影响国家的法律和文化限制，你可以在战略政策计划中加入尽可能多的参数和考虑因素。还应考虑非政府组织的作用和行动。

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- 5. Exogenous events. In addition to endogenous systemic dynamics, exogenous events are also highly likely to occur and alter the situation parameters in these volatile environments, For example, a major terrorist attack in Paris, France has been linked to the Syrian refuge crisis, and has resulted in substantial shifts in the attitudes and policies of many European countries with respect to refugees. The event has also raised concerns among local populations. For example, Brussels, Belgium was placed in a lockdown after the Paris raids in attempts to capture possible terrorists.
- 5.外部突发事件。除了内生性系统的变化外，外生性事件也极有可能发生并改变这些多变环境中的环境参数，例如，法国巴黎发生的一起与叙利亚难民危机有关的重大恐怖袭击，导致许多欧洲国家对难民的态度和政策发生重大转变。这一事件也引起了当地居民的关注。例如，比利时布鲁塞尔在巴黎袭击事件后被封锁，就是为了抓捕可能的恐怖分子。

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- a) What parameters of the model would likely shift or change completely in a major exogenous event?
- b) What would be the cascading effects on the movement of refugees in neighboring countries?
- c) How will the immigration policies that you recommend be designed to be resilient to these types of events?
- （a）在重大的外生事件中，模型的哪些参数可能会完全改变或改变?
- （b）难民在邻国的流动会产生什么连锁效应?
- （c）您建议的移民政策将如何应对这类事件?

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- 6. Scalability. Using your model, expand the crisis to a larger scale – by a factor of 10. Are there features of your model that are not scalable to larger populations? What parameters in your model change or become irrelevant when the scope of the crisis increases dramatically? Do new parameters need to be added? How does this increase the time required to resolve refugee placement?
- 6. 扩展性。利用您的模型，将危机扩大到更大的范围——例扩大到原来的10倍。您的模型是否有一些特性不适用于人群扩展到更大时?当危机的范围急剧扩大时，您的模型中的哪些参数会发生变化或变得无关紧要?是否需要添加新的参数?解决安置难民问题所需的时间如何增加?

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- If resolution of the refugee integration is significantly prolonged, what new issues might arise in maintaining the health and safety of the refugee and local populations? What is the threshold of time where these new considerations are in play? For example, what policies need to be in place to manage issues such as disease control, childbirth, and education?
- 如果解决难民融合的时间大大延长，在维持难民和当地居民的健康和安全方面可能会出现什么新问题?什么时候开始考虑这些新问题?例如，需要制定哪些政策来管理疾病控制、生育和教育等问题?

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- The Report: The UN Commission on Refugees has asked your ICM-RUN team to provide them a 20- page report that considers the factors given in your tasks. Each team should also write a 1 page policy recommendation letter which will be read by the UN Secretary General and the Chief of Migration.
- 报告：联合国难民事务委员会要求你们小组向他们提供一份20页的报告，其中包含你的任务中给出的各种因素。每个小组还应编写一个1页的政策建议信，由联合国秘书长和移民局局长审阅。

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- Your ICM submission should consist of a 1 page Summary Sheet, a 1 page letter to the UN, and your solution (not to exceed 20 pages) for a maximum of 22 pages. Note: The appendix and references do not count toward the 22 page limit.
- 你们提交的文件应该包括一个1页的摘要，一个1页的给联合国信，和您的解决方案（不超过20页）最多22页。注：附录和参考资料均不计算到22页的限制里。

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- The Commission has also provided you with some on-line references that may be helpful:
- 委员会还向你提供了一些可能有用的在线参考资料：

- http://www.bbc.com/news/world-europe-34131911
- http://www.iom.int/
- http://iussp2009.princeton.edu/papers/90854
- http://www.unhcr.org/pages/49c3646c4d6.html
- http://www.nytimes.com/2015/08/28/world/migrants-refugees-europe-syria.html?_r=0
  http://www.who.int/features/qa/88/en/
- http://www.euro.who.int/en/health-topics/health-determinants/migration-and-health/migrant-health-inthe-european-region/migration-and-health-key-issues
- https://www.icrc.org/en/war-and-law/protected-persons/refugees-displaced-persons

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2017 ICM Problem F Migration to Mars: 迁移到火星：2100城市社会的乌托邦劳动力

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2017 ICM Problem F: Migration to Mars: Utopian Workforce of the 2100 Urban Society 迁移到火星：2100城市社会的乌托邦劳动力

- The international agency, Laboratory of Interstellar Financial & Exploration Policy (LIFE), has recently (in this year of 2095) completed a series of short-term planned living experiments on our neighbor planet, Mars. New technologies, including personalized artificial augmentations units, will soon enable humans to inhabit manufactured cities on Mars by 2100. The first wave of migration, called Population Zero, will include 10,000 people.
- 国际机构，星际金融与勘探政策实验室（LIFE），最近（在2095这一年）完成了一系列计划在我们的邻居火星短期生活的实验。到2100年，包括个性化人工增强设备在内的新技术，将很快使人类能够居住在火星上人造的城市里。第一波移民被称为“人口零行动”，将包括1万人。

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2017 ICM Problem F:迁移到火星：2100城市社会的乌托邦劳动力

- The LIFE agency launched project UTOPIA: 2100, with the goal of creating an optimal workforce for the 22nd century to give all people the greatest quality of life with a vision of sustainability for the next 100 years. Over the last 20 years, several planned communities have been designed and built across Earth that tested several planned living conditions. These communities are driven by egalitarian principles in economics, government, workforce, and justice systems.
- LIFE机构启动了乌托邦计划：2100年，旨在为22世纪创造最优的劳动力，为所有人提供最高质量的生活，并展望未来100年可持续发展。在过去20年里，几个计划的社区已经在地球上设计和建造，这些社区测试了几个计划中的生活条件。这些社区在经济，政府，劳动力和司法体系方面的运行原则是平等主义。

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- LIFE is seeking a set of mathematical and computational models that will inform the International Coalition on Mars (ICM) government on how to design an economic-workforce-education system that they can implement with Population Zero. In order to decide what procedure to follow, LIFE has hired the most qualified policy makers and data scientists with the goal to develop a set of policies to realize the migration to Mars. Your three-person policy modeling team is part of the group of advisors and policy makers. ICM has asked your group for a policy model and report that will result in a set of policy recommendations that will create a sustainable life-plan and will make the living experience on Mars in the year 2100 even better than the Earthly one in the current year of 2095.
- LIFE正在寻求一系列的数学和计算模型，告诉国际火星联盟（ICM）政府如何设计一个可以用人口零行动实施的经济劳动力教育系统。为了决定后续要做什么和怎么做，LIFE聘用了最有资格的政策制定者和数据科学家，目的是制定一套实现向火星移民的策略。你们三人政策建模小组是决策和顾问小组的一部分。要求你们小组建立一个政策模型并写份报告，提出一套政策建议，创造一个可持续的生活计划，使2100年在火星的生活体验甚至比2095年在地球上的更好。

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- New tools in network science, systems science, complex systems, organizational & industrial psychology, and other interdisciplinary fields provide new insights for understanding social and governmental systems, with important capabilities to deal with issues of scalability (relevant for both small and large populations and effects), modality (multiple layers), and dynamics (changes over time).
- 网络科学，系统科学，复杂系统，组织机构和工业心理学以及其他跨学科领域的新工具为理解社会和政府系统提供了新的见解，具有处理可扩展性问题（与小群体和大群体和效果相关），模式（多层）和动态（随时间的变化）的重要能力。

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- Population Zero aims to have optimal conditions in many workforce and social living factors (note that another team is being tasked with health policy, so ICM has asked that you exclude health care from your analysis). The mission of Population Zero is to create a sustainable society by maximizing both economic output (GDP) and happiness in the work place for its citizens. Of course, these two goals can be in opposition, so the policy recommendation has to consider balancing factors, such as:
- 人口零行动目的是在劳动力和社会生活中具有最佳条件（注意另一个小组正在负责健康政策，因此你们的分析中不包含医疗卫生）。人口零行动的任务是通过最大限度地提高GDP和工作幸福感来为公民创造一个可持续发展的社会。当然，这两个目标可能是相反的，因此政策建议必须考虑平衡因素，如：

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- Income: Ensure adequate compensation so that all people can afford fundamental necessities (shelter, food, clothes).
- Education: Provide high quality education that prepares citizens for the needs and challenges of the 22nd Century.
- Equality: Improve the retention of women in the workforce, particularly in fields where they have been underrepresented or discriminated against on Earth

- 收入：确保足够的补偿，使所有人都能买得起基本的必需品（住所，食物，衣服）。
- 教育：提供高质量的教育，使公民能应对22世纪的需要和挑战。
- 平等：提高妇女在劳动力中的地位，特别是她们在地球上被忽视或受到歧视的领域。

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- Your ICM-directed tasks are:
- 1. Define parameters and specific outcomes related to the three priority factors (income, education, and social equality) in Population Zero. Some issues to consider are: a) minimum wage and salary distribution (income); b) skills required for an efficient workforce; types of governance and infrastructure needed to obtain these skills (education); and c) maternity and paternity leave, affordable childcare to ensure people can remain in the workforce (social equality).
- 你们的直接任务是：
- 1. 在人口零行动中定义三个优先因素（收入，教育和社会平等）相关的参数和具体效果。需要考虑的一些问题是：a）最低工资和工资分配（收入）；b）高效劳动力所需的技能;获得这些技能所需的管理类型和基础设施（教育）;和c）产假和陪产假，让人负担得起儿童保育，又能留在劳动大军里（社会平等）。

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- a. Identify and define the specific outcomes that would indicate positive results across the three factors for the next decade (years 2100-2110). Consider what the goal is for each of these factors; for example, is the objective to improve the quality of living for all citizens or improve quantity of output of the system.
- b. What are the major features of the population (eg. demographics, population size, and working conditions) that would contribute to these outcomes?
- c. Create metrics that you will use to evaluate whether the system is meeting its objective by identifying and defining the critical parameters for each of the three factors.
- a：确定并定义未来十年（2100-2110年）在三个因素方面中取得积极成果的具体结果。考虑每个因素的目标是什么;例如，目标是改善所有公民的生活质量还是提高系统的产出数量。
- b：哪些人口的主要特征（例如人口统计特征，人口数量和工作条件）将影响这些结果？
- C：通过识别和定义这三个因素的重要参数，创建用于评价系统是否满足目标要求的度量指标

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- 2. You have been asked to generate a sample population of 10,000 people to emigrate to Mars. Extract data from a census dataset (link to one is provided below) or synthesize one.
- a. From your data set, identify and analyze the demographic characteristics of this simulation of Population Zero. Analyze and describe demographic distributions, such as gender, ethnicity, age, and education levels.
- 2. 建立一个10,000人移民到火星的样本人口。从人口普查数据中选取(下面提供了一个数据的链接)或者合成。
- a:从你的数据组中，识别和分析人口零行动模拟的人口统计特征。分析和描述人口结构的分布，如性别，种族，年龄和教育水平。

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- b. Consider the distribution of citizens in terms of factors that will also help to meet goals of UTOPIA: 2100 – to build a peaceful, cooperative, egalitarian society. Are your data sufficient to determine these factors? For example, should the distribution of innovators versus producers be considered? Of skilled versus unskilled labor? Of families versus single people?
- b。考虑公民的分配，有助于实现乌托邦的目标： 2100年建立一个和平，合作，平等的社会。您的数据是否足以确定这些因素？例如，是否应考虑创新者与生产者的分配？熟练工与非熟练工的区别？家庭与单身的区别？

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- Link to PUMS data (if you desire to use this census data): PUMS数据的链接（如果你希望使用此人口普查数据）：

PUMS data can be found via following links: PUMS数据可以通过以下链接找到：

- http://www.census.gov/programs-surveys/acs/technical-documentation/pums.html
- http://www2.census.gov/programs-surveys/acs/data/pums/2015/1- Year/

These links show how to extract the data in R:这些链接显示如何提取R中的数据：

- https://stat.ethz.ch/R-manual/R-devel/library/base/html/sample.html
- https://cran.r-project.org/web/packages/sampling/sampling.pdf

This link show how to extract the data in MATLAB:此链接显示如何在MATLAB中提取数据：

- https://www.mathworks.com/help/stats/datasample.html?requestedDomain=www.mathworks.com

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- 3. Build a model that includes the three identified factors (income, education, & social equality). Using the parameters that you created in **task 1**, define the key elements of a successful society for the next 10 years. When integrating these three factors, what are the critical interdependencies among the parameters? Are there additional constraints required to preserve the outcomes over the 10 year period? How often should the model be evaluated to ensure the goals of UTOPIA 2100 continue to be met? What might be economic, social, cultural, and other global factors that might affect the viability of the model over that period? Based on these factors and constraints, answer the following:
- 3. 建立一个包括三个确定因素（收入，教育和社会平等）的模型。使用您在任务1中创建的参数，定义未来10年成功社会的关键要素。当整合这三个因素时，参数之间的关键相互依赖性是什么？是否需要额外的限制来保持10年期间的结果？应该多久对模型进行一次评估，以确保继续满足乌托邦2100的目标？在此期间可能影响模型可行性的经济，社会，文化和其他全球性因素是什么？基于这些因素和约束，回答以下问题：

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- a. Determine the optimal minimum wage and salary distribution to best manage the tension between wellbeing (higher quality of life) and support for those less equipped to provide labor services.
- b. Identify terms in your model that can be most improved through contribution of new ideas. Describe the incentives to motivate contribution of those new ideas.
- c. What is the best childcare and paternity/maternity leave strategies?
- a：确定最佳的最低工资和工资分配，为能更好地解决福利（更高的生活质量）和那些不能提供劳动服务的人之间的紧张关系。
- b：指出您的模型中哪部分可以通过提出新想法得到最大的改进。描述产生这些新想法的动机。
- C：什么是最好的育儿和陪产假/产假策略？

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- 4. Now that you have created models for the three factors, proceed to merge these models into a global model. In **task 3**, you designed a model to provide optimal outcomes for society, at large. Now, consider how the model will function for different groups?
- 4. 既然您已经为三个因素创建了模型，继续将这些模型合并到全局模型中。在任务3中，您设计了一个模型来为整个社会提供最优结果。现在，考虑一下这个模型将如何为不同的群体工作?

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- a. Identify the major subgroups of your workforce, and identify their main priorities. For example, unskilled labor force might be concerned with work hours, disability care, child care, and minimum wage, while the priorities of the professional workforce may be time off, training, and parental leave. Your model will dictate which subgroups you consider. You might have to develop new parameters to adequately evaluate each groups' priorities.
- a:确定你的劳动力的主要群体，并确定他们的主要优先事项。例如，非技术工人可能关心工作时间，残疾照顾，儿童保育和最低工资，而专业人员优先考虑的可能是休假，培训和育儿假（陪产假）。您的模型取决于您考虑的是哪个群体。为了能充分评估每个群体的优先事项，您可能需要建立新参数。

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- b. With the understanding that each group will have a different set of needs, perspectives, and criteria for success, analyze how closely their needs are met in terms of income, education, and equality. For example, does your model function differently across educational levels? Different ages? Different cultural values? Does your model function better for women or men? How are families affected?
- b。了解每个群体对于成功有不同的需求，观点和标准，分析怎样满足他们在收入，教育和平等方面的需求。例如，您的模型在不同教育水平上的功能是否不同？不同年龄段呢？不同的文化价值观呢？你的模型更适合女性还是男性？家庭（非单身）呢，又会受到怎样的影响？

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- c. With the consideration of the subgroups that you have identified, your previous model may no longer produce optimal outcomes. Adjust the model by adding new constraints or parameters to optimize the needs of the different subgroups. The goal is to maximize the priority outcomes of the subgroups without significantly reducing the global outcomes.
- C。考虑到您已确定的群体，您以前的模型可能不再产生最佳结果。通过添加新的约束或参数来调整模型，以优化满足不同群体的需求。目标是使不同群体优先想要的最大化，而不会显著减少全部想要的。

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- 5. LIFE has planned additional migration phased over the next 100-years.
- a. How sensitive is your model to the population selection for various migration phases? Does the demographic distribution of this population significantly change the outcomes? How does your sampling procedure affect your model? If migration and growth in future years will be similar to Population Zero (10,000 people in a new manufactured city at a time), how would you change your model for the next few migrations? How sustainable are your recruitment and selection processes?
- 5. LIFE计划在未来100年内分阶段进行更多的迁移。
- a. 您的模型对于各种迁移阶段的群体选择的敏感性如何？这个群体的人口分布特征是否会显著改变结果？你的抽样如何影响你的模型？如果未来几年的移民和增长将实现人口零行动（一次新造一个10,000人的城市），你将如何修改你的模型以适合后续的几次迁移？你的甄选过程的可持续性如何？

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- b. Is this long-term plan substantially different than the 10-year plan? Are there elements in your 10-year vision and recommendations that are not sustainable for the 100 year vision? Identify any new parameters or constraints that will ensure your model continues to be effective for the entire 22nd century.
- b。这个长远计划与十年计划在本质上有不同吗？10年远景规划和建议中有哪些要素，这些要素对于100年远景规划是否可持续的？确定新的参数或约束，以确保您的模型在整个22世纪继续有效。

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- 6. In shocking news, scientists discover a threat of a collision of Earth with a planet sized comet. We need to evacuate planet Earth and move as many people as possible to Mars to live in enlarged manufactured cities.
- 6. 爆炸新闻，科学家发现地球会与彗星尺寸大小的行星碰撞。我们需要疏散地球上的居民，把尽可能多的人转移到火星，让他们住在建造得足够大的城市里。
- a. Is your model still functional? Would it make a difference if migrations occurred in phases?
- a：您的模型是否仍然有效？如果迁移分阶段进行，它会有所不同吗？

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- b. Study the robustness of your model and comment on its general sensitivity to a much larger scale migration.
- c. State the strengths and weaknesses of your model relative to a major migration.
- b。研究您的模型的稳定性，并评论其对更大规模迁移的一般敏感性。
- C。说明您的模型相对于主要迁移的优缺点。

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- 7. Write a policy recommendation addressed to the director of LIFE that includes the factors of income, education, equality policies based on your model and according to the directions of ICM. Will your recommendations change depending on the composition and size of the Population Zero? Explain the reasoning that led you to your recommendations and analyze the results you are expecting to achieve.
- 7. 基于您的模型和ICM的要求，给LIFE领导写一份包括收入、教育、平等政策等方面的政策建议。你的建议会因人口的构成和规模而改变吗？解释你提出建议的理由，并分析你期望达到的结果。

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- *Your ICM submission should consist of a 1 page Summary Sheet, a 1-2 page policy recommendation, and your solution (not to exceed 20 pages) for a maximum of 23 pages. Note: The appendix and references do not count toward the 23 page limit.*
- 您的ICM提交应包括1页的摘要表，1-2页的政策建议和您的解决方案（不超过20页），总共最多23页。注意：附录和参考文献不计入23页的限制。
- **References: 参考文献**
- https://www.kansascityfed.org/publications/community/transformworkforce
- https://www.kansascityfed.org/~/media/files/publicat/community/workforce/transforming workforcedevelopment/book/transformingworkforcedevelopmentpolicies.pdf
- http://www.economist.com/blogs/freeexchange/2012/01/chinas-labour-force

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2018 ICM Problem F Cost of Privacy 隐私成本

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2018 ICM Problem F: Cost of Privacy 隐私成本

- Pervasiveness of, and reliance on, electronic communication and social media have become widespread. One result is that some people seem willing to share private information (PI) about their personal interactions, relationships, purchases, beliefs, health, and movements, while others hold their privacy in these areas as very important and valuable. There are also significant differences in privacy choices across various domains.
- 电子通信和社交媒体的普及和依赖，已经变得很普遍。 一种结果是，有些人似乎愿意分享他们的个人互动、人际关系、购物、信仰、健康和运动的私人信息（PI），而另一些人则认为这些隐私非常重要非常有价值。不同领域的隐私界定选择也有显著差异。

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- For example, some people are quick to give away the protection of their purchasing information for a quick price reduction, but at the same time are unlikely to share information about their disease conditions or health risks. Similarly, some populations or subgroups may be less willing to give up particular types of personal information if they perceive it posing a personal or community risk. The risk may involve loss of safety, money, valuable items, intellectual property (IP), or the person's electronic identity.
- 例如，一些人迅速放弃购物信息的保护，以便迅速降价，但同时不太可能分享有关其疾病状况或健康方面的信息。 同样，某些人或群体感觉某些特殊类型的个人信息会存在个人或社会风险，他们可能不愿意放弃这些信息。 风险可能涉及安全，金钱，贵重物品，知识产权（IP）或个人电子身份的损失。

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- Other risks include professional embarrassment, loss of a position or job, social loss (friendships), social stigmatization, or marginalization. While a government employee who has voiced political dissent against the government might be willing to pay to keep their social media data private, a young college student may feel no pressure to restrict their posting of political opinion or social information. It seems that individual choices on PI protection and internet and system security in cyber space can create risks and rewards in elements of freedom, privacy, convenience, social standing, financial benefits, and medical treatment.
- 其他风险包括职业尴尬，失去职位或失去工作，社交损失（友谊），社会耻辱或边缘化。 虽然政府职员可能会花钱保护其对政府表示异议的社交媒体数据，但年轻的大学生可能对发表政治观点或社会信息不会感到任何压力。个人在PI保护、网络空间的互联网和系统安全上的选择似乎可以在自由，隐私，便利，社会地位，经济利益和医疗等方面产生风险和回报。

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- Is private information (PI) similar to private personal property (PP) and intellectual property (IP)? Once lawfully obtained, can PI be sold or given to others who then have the right or ownership of the information? As detailed information and meta-data of human activity becomes more and more valuable to society, specifically in the areas of medical research, disease spread, disaster relief, businesses (e.g. marketing, insurance, and income), records of personal behaviors, statements of beliefs, and physical movement, these data and detailed information may become a valuable and quantifiable commodity. Trading in one's own private data comes with a set of risks and benefits that may differ by the domain of information (e.g. purchasing, social media, medical) and by subgroup (e.g. citizenship, professional profile, age).
- 私人信息（PI）是否与私人财产（PP）和知识产权（IP）类似？ 一旦合法获得，PI可以被出售或给予那些有权利拥有信息的人吗？ 随着人类活动的详细信息和数据对社会越来越有价值，尤其是在医学研究，疾病传播，救灾，商业活动（如营销，保险和收入），个人行为记录，信仰和体育锻炼方面，这些数据和详细信息可能成为一种有价值和可量化的商品。 交易自己的私人数据会带来一系列风险和收益，这些风险和收益可能因信息领域不（例如购物，社交媒体，医疗）和群体（如公民身份，专业背景，年龄）不同而有所不同。

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2018 ICM Problem F: Cost of Privacy 隐私成本

- Can we quantify the cost of privacy of electronic communications and transactions across society? That is, what is the monetary value of keeping PI protected, or how much would it cost for others to have or use PI? Should the government regulate this information or is it better left to privacy industry or the individual? Are these information and privacy issues merely personal decisions that individuals must evaluate to make their own choices and provide their own protection?
- 我们能否量化整个社会电子通讯和交易的隐私成本？ 也就是说，保护PI要多少钱，或者其他人拥有或使用PI的要多少钱？ 政府该管制这些信息还是留给隐私行业或个人？ 这些信息和隐私问题只是个人决定的吗，个人必须做出选择并提供自己的保护吗？

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- There are several things to consider when evaluating the cost of privacy. First, is data sharing a public good? For example, Center for Disease Control may use the data to trace the spread of disease in order to prevent further outbreak. Other examples include managing at risk populations, such as children under 16, people at risk of suicide, and the elderly. Moreover, consider groups of extremists who seek to hide their activities. Should their data be trackable by the government for national security concerns? Consider a person's browser, phone system, and internet feed with their personalized advertisements; how much is this customization worth?
- 评估隐私成本时需要考虑几件事情。 首先，数据共享是公共产品吗？ 例如，疾病控制中心可能使用这些数据来追踪疾病的传播，以防止疾病进一步的暴发。 还例如管理危险人群，如16岁以下的儿童，有自杀倾向的人和老人。 此外，还有那些试图隐藏自己的极端主义分子。出于国家安全，政府该追踪他们的数据吗？ 一个人的浏览器，电话系统和有个性化广告的互联网；这些作为商品值多少钱？

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- Overall, when evaluating cost of privacy we need to consider all of these tradeoffs. What is the potential gain from keeping data private and what is lost by doing so?
- 总的来说，在评估隐私成本时，我们需要做些权衡，即保持数据私有的潜在收益是什么？这样做会损失什么？
- As a policy analysis team for a national decision maker, your team's tasks are:
- 作为国家决策者的政策分析团队，您们团队的任务是：
- **Task 1:** Develop a price point for protecting one's privacy and PI in various applications. To evaluate this, you may want to categorize individuals into subgroups with reasonably similar levels of risk or into related domains of the data. What are the set of parameters and measures that would need to be considered to accurately model risk to account for both 1) characteristics of the individuals, and 2) characteristics of the specific domain of information?
- 任务1：确定保护个人隐私的价格点和PI的各种用途。 为了对此进行评估，您可能需要将风险水平相近的个体合理归类为一组或归为相应数据的领域。 为了准确地模拟，需要考虑哪些参数和措施来解释1）个体的特征和2）特定信息领域的特征？

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- **Task 2:** Given the set of parameters and measures from Task 1, model for cost of privacy across at least three domains (social media, financial transactions, and health/medical records). In your base model consider how the tradeoffs and risks of keeping data protected affect your model. You may consider giving some of the tradeoffs and risks more weight than others as well as stratifying weights by subgroup or category. Consider how different basic elements of the data (e.g. name, date of birth, gender, social security or citizenship number) contribute to your model. Are some of these elements worth more than others? For example, what is the value of a name alone compared with value of a name with the person's picture attached? Your model should design a pricing structure for PI.
- 任务2：至少在（社交媒体，金融交易和健康/医疗记录）三个领域中，根据任务1的隐私定价模型给定一组参数和度量。 在您的基本模型中，考虑保持数据受保护与否的权衡和风险如何影响您的模型。您可以考虑给予权衡和风险比分组或类别更大的权重。考虑数据的不同基本要素（例如姓名，出生日期，性别，社会保障或公民身份号码）如何影响您的模型。这些元素中有些是否比其他元素更有价值？ 例如，与附有该人照片的名字的价值相比，姓名的价值是多少？请您为PI设计一个定价模型。

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- **Task 3:** Not long ago, people had no knowledge about which agencies had purchased their PI, how much their PI was worth, or how PI was being used. New proposals are being put forth which would turn PI into a commodity. With the pricing structure you generated in Task 2, establish a pricing system for individuals, groups, and entire nations. With data becoming a commodity subject to market fluctuations, is it appropriate to consider forces of supply and demand for PI? Assuming people have control to sell to their own data, how does this change the model?
- 任务3：不久之前，人们不知道哪个机构购买了PI，他们的PI价值多少，PI如何使用。 现有新的建议，即将PI变成商品。 利用您在任务2中产生的定价结构，为个人，团体和整个国家建立定价体系。 随着数据成为受到市场波动影响的商品，考虑PI供求关系是否合适？ 假设人们有销售他们自己数据的控制权，模型将如何改变？

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2018 ICM Problem F: Cost of Privacy 隐私成本

- **Task 4:** What are the assumptions and constraints of your model? Assumptions and constraints should address issues such as government regulations (e.g. price regulations, specific data protections such as certain records that may not be subject to the economic system) and cultural and political issues. Based on your model and the political and cultural issues, consider if information privacy should be made a basic human right when thinking about policy recommendations. Consider introducing a dynamic element to your model by introducing the variations over time in human decision-making given changing personal beliefs about the worth of their own data (e.g. personal data such as name, address, picture), transaction data (e.g. on-line purchases, search history), and social media data (e.g. posts, pictures).
- 任务4：你的模型有哪些假设和约束？ 假设和约束条件应解决政府法规（例如价格法规，特定数据保护，如某些不受经济制度约束的记录）以及文化和政治问题等方面的问题。 根据你的模型和政治文化的问题，在考虑政策建议时是否应该把信息隐私作为基本的人权。 考虑人一生中对自身数据价值（如姓名，地址，图片等个人数据）的认识、交易数据（如网上购物、搜索历史）和社交媒体数据（例如帖子，图片）会变，在你的模型中引入随时间变化的动态变量。

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- **Task 5:** Are there generational differences in perceptions of the risk-to-benefit ratio of PI and data privacy? As generations age, how does this change the model? How is PI different or similar to PP and IP?
- 任务5：PI和数据隐私的风险收益比是否存在代际差异？ 考虑代际更替，模型该如何修改？ PI和PP和IP有什么异同？

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- **Task 6:** What are the ways to account for the fact that human data is highly linked and often each individual's behaviors are highly correlated with others? Data on one person can provide information about others whom they are socially, professionally, economically, or demographically connected. Therefore, personal decisions to share one's own data can affect countless others. Are there good ways to capture the network effects of data sharing? Does that effect the price system for individuals, subgroups, and entire communities and nations? If communities have shared privacy risks, is it the responsibility of the communities to protect citizens' PI?
- 任务6：人类数据高度相关，并且每个人的行为往往与他人高度相关，如何解释这一事实？一个人的数据可以提供他在社会、职业、经济或其他方面与之相关的人的信息。 因此，个人决定分享自己的数据会影响到无数其他人。 有没有很好的方法可以捕获数据共享引起的网络效应？ 这是否会影响个人，群体和整个社会和国家的价格体系？ 如果社会共享隐私风险，那么社会就有责任保护公民的PI吗？

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- **Task 7:** Consider the effects of a massive data breach where millions of people's PI are stolen and sold on the dark web, sold as part of an identity theft ring, or used as ransom. How does such a PI loss or cascade event impact your model? Now that you have a pricing system that quantifies the value of data per individual or loss type, are agencies that are to blame for the data breach responsible to pay individuals directly for misuse or loss of PI?
- 任务7：想想一个大规模的数据泄露的后果吧，数百万人的PI在黑网上被盗售，被盗用或作为赎金使用。 这样的PI损失或连锁效应如何影响你的模型？ 现在您已经有一个定价系统，它可以量化每个人或每个损失类型的数据的价值，那么对数据泄露负责的代理机构是否有责任为PI滥用或丢失直接向个人付费呢？

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- **Task 8:** Write a two-page policy memo to the decision maker on the utility, results, and recommendations based your policy modeling on this issue. Be sure to specify what types of PI are included in your recommendations.
- 任务8：根据你在这个问题上的策略模型，向决策者写一个两页的策略备忘录，内容包括实用程序，结果和建议。 请务必在建议中详细说明PI的类型。

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2018 ICM Problem F: Cost of Privacy 隐私成本

- Your submission should consist of:
- One-page Summary Sheet,
- Two-page memo,
- Your solution of no more than 20 pages, for a maximum of 23 pages with your summary and memo.
- Note: Reference list and any appendices do not count toward the 23-page limit and should appear after your completed solution.
- 您的提交文件应该包括：
- 一页总结表，
- 两页的备忘录，
- 您的正文不超过20页，包括摘要和备忘录最多23页。
- 注意：参考列表和任何附录不计入23页里，应附在正文后面。

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2019 ICM Problem F Universal, Decentralized, Digital Currency: Is it possible?通用，分散，数字货币：有可能吗？

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2019 ICM Problem F: Universal, Decentralized, Digital Currency: Is it possible? 通用，分散，数字货币：有可能吗？

- *Digital currency* can be used like traditional currencies to buy and sell goods, except that it is digital and has no physical representation. Digital currency enables its users to make transactions instantaneously and without any concern for national borders. *Cryptocurrency* is a subset of digital currency with unique features of privacy, decentralization, security and encryption.
- 数字货币可以像传统货币一样用于商品买卖，只不过它是数字化的，没有物理载体。数字货币使其用户能够即时进行交易，而无需担心国界。加密数字货币是数字货币的一种，具有隐私性，分散性，安全性和加密性的独一无二特点。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- Cryptocurrencies have exploded in popularity in various parts of the world; moving from an *underground cult* interest to a globally accepted phenomenon. Bitcoin and Ethereum, both cryptocurrencies, have grown in value, while investors are projecting rapid growth for other cryptocurrencies such as Dogecoin or Ripple. In addition to digital and cryptocurrencies, there are also new digital methods for financial transactions that enable users to instantaneously exchange money with nothing more than an email address or a thumbprint.
- 加密数字货币在世界各地迅速普及;从地下小众圈转向全球接受的现象。比特币和以太币这两种加密数字货币的价值都在增长，而投资者也计划使其他加密数字货币如狗狗币或者瑞波币快速增长。除了数字货币和加密数字货币之外，还有一些新的金融交易数字方法，使用户能够通过电子邮件地址或指纹瞬间兑换货币。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- Peer-to-peer payment systems offered by companies like PayPal, Stripe, Venmo, Zelle, Apple Pay, Square Cash, and Google Pay offer virtual movement of money across the globe in seconds without ever having to verify the transaction through a bank or currency exchange. Digital transactions outpace cash and check transactions because they are not delayed by banking policies, national borders, citizenship, debts, or other social-economic factors. These new currency systems decentralize financial transactions, leaving many to consider a world where traditional banking may become obsolete.
- PayPal，Stripe，Venmo，Zelle，Apple Pay，Square Cash和Google Pay等公司提供的点对点支付系统可在几秒钟内实现全球虚拟货币流动，无需通过银行或货币兑换。数字交易超过现金和支票交易，因为它们不会受到银行政策，国界，公民身份，债务或其他社会经济因素的影响。这些新的货币系统分散了金融交易，使许多人认为传统银行业可能已经过时。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- Concerns about security of cryptocurrencies worry both citizens and economic analysts. These concerns have constrained its growth in some communities. On the other hand, much of the popularity of cryptocurrency is due to its departure from traditional overly-restrictive security and debt measures that rely on oversight by large banks and governments. These oversight institutions are often expensive, deeply bureaucratic, and sometimes corrupt.
- 关于加密数字货币的安全性，公民和经济分析师都有顾虑。这些顾虑限制了加密数字货币在部分地区的发展。另一方面，加密数字货币的流行是由于它偏离了传统的过度限制性安全和债务措施，而这些是依赖于大型银行和政府监管的。这些监督机构往往耗资巨大，官僚作风严重，有时甚至腐败。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- Some experts believe that a universal, decentralized, digital currency with internal security like *blockchain* can make markets more efficient by eliminating barriers to the flow of money. This is particularly important in countries where the majority of citizens do not have bank accounts and are unable to invest in regional or global financial markets.
- 一些专家认为，具有内部安全性（如区块链）的通用，分散的数字货币可以通过消除货币流动障碍来提高市场效率。这对于大多数公民没有银行账户且无法在区域或全球金融市场投资的国家，尤其重要。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- Some governments, however, view the lack of regulation around these currencies and their *anonymity* as too risky because of how easily they can be used in *illicit* transactions, such as tax sheltering or purchasing illegal merchandise. Others feel that a secure digital currency offers a more convenient and safer form of financial exchange. For instance, a universally accepted currency would enable truly global financial markets and would protect individual assets against regional inflation *fluctuations* and artificial manipulation of currency by regional governments. If alternative digital systems become more established, there will be many questions about how digital currency will affect current banking systems and *nation-based currencies*.
- 然而，一些政府认为围绕这些货币缺乏监管及其匿名性风险太大，因为它们很容易被用于非法交易，例如避税或购买非法商品。 其他的则认为安全的数字货币提供了更方便，更安全的金融交易形式。例如，普遍接受的货币将实现真正的全球金融市场，并保护个别资产免受区域性通货膨胀波动和地区政府人为操纵货币的影响。如果可供选择的数字系统日益增加，关于他们如何影响现有银行系统和国有货币的问题也越来越多。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- Your policy modeling team has been employed by the International Currency Marketing (ICM) Alliance to help them identify the viability and effects of a global decentralized digital financial market. ICM Alliance has asked you to construct a model that adequately represents this type of financial system, being sure to identify key factors that would limit or facilitate its growth, access, security, and stability at both the individual, national, and global levels.
- 您的政策建模团队已受雇于国际货币营销（ICM）联盟，帮助他们对全球分散数字金融市场存在的可行性和影响做出判定。要求：建立一个充分代表上述金融体系的模型，在个人，国家和全球三个层面上，明确指出限制或促进其增长，准入，安全和稳定的关键因素。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- This requires you to consider the different needs of countries and their willingness to work with this new financial marketplace and modify their current banking and *monetary* models. It may or may not require them to abandon their own currency, so that adds a level of complexity to the market model. You are not to choose an existing digital currency, but discuss the strategies for adoption, and problems in implementation of, a general digital currency. You should also include the mechanisms for oversight of such a global digital currency. The ICM Alliance has asked you to extend your analysis to consider the long-term effects of such a system on the current banking industry; the local, regional, and world economy; and international relations between countries
- 这要求您考虑各国的不同需求及其与这个新金融市场合作的意愿，并修改其当前的银行和货币模式。它可能会也可能不会要求它们放弃自己的货币，这会增加市场模型的复杂程度。您不是要选择现有的数字货币，而是讨论采用通用数字货币的策略和实施过程中的问题。还应该包括这种通用数字货币的监督机制。要求进一步分析，研究这样一个货币系统对当前银行业;地方，区域和世界经济；国际关系的长期影响。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- ICM requests a report of your modeling and analysis, and a separate one-page policy recommendation for national leaders, who hold mixed opinions about this effort. The policy recommendation should offer rationale for the parameters and dynamics included in your model and reflect the insights you gained from your modeling. Your polices might address, for example, growth, reach, access, security, and stability of the system.
- 要求提供建模和分析的报告，并为对此持不同观点的国家领导人提供一份一页纸的政策建议。政策建议应对模型中包含的参数和变量的进行阐述，并反映您从建模中获得的见解。例如，您的政策建议应注明这种货币系统的增长，覆盖范围，准入，安全性和稳定性。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- Your team's submission should consist of:
- One-page Summary Sheet,
- One-page policy recommendation for national leaders,
- Your solution of no more than 20 pages, for a maximum of 22 pages with your summary and policy recommendation.
- Judges expect a complete list of references with in-text citations, but may not consider appendices in the judging process.
- Note: Reference list and any appendices do not count toward the 22-page limit and should appear after your completed solution.
- 您的团队提交的内容应包括：
- 一页摘要表，
- 给国家领导人的一页政策建议，
- 您的解决方案不超过20页，最多22页，包含您的摘要和政策建议。
- 评委希望提供完整的参考文献列表，其中包含文本引文，但在评审过程中可能不会考虑附录。
- 注意：参考列表和任何附录不计入22页里，附在正文后面。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- **Glossary: 名词解释**
- **Anonymity –** the state of being unnamed or unidentified; the state of being anonymous.
- 匿名 – 未命名或未识别的状态;匿名的状态。
- **Blockchain –** the record keeping technology that can document transactions between two parties in a verifiable and permanent way; a digital database containing information that can be shared and simultaneously used across a large publicly accessible and decentralized network.
- 区块链 – 记录保存技术，可以以可验证和永久的方式记录双方之间的交易;数字数据库，包含可在大型公共可访问和分散网络中共享和同时使用的信息。
- **Cryptocurrency –** a digital or virtual currency that uses cryptography (protecting information through the use of codes) for security.
- 加密数字货币 – 一种数字或虚拟货币，它使用加密技术（通过使用代码保护信息）以确保安全。
- **Digital Currency –** [digital money, electronic money, electronic currency] is a type of currency in digital (electronic) versus physical (coins, paper) form.
- 数字货币 – [数字货币，电子货币，电子货币]是一种数字（电子）与实物（硬币，纸币）形式的货币。

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2019 ICM Problem F:通用，分散，数字货币：有可能吗？

- **Illicit** – illegal or dishonest.非法 – 非法或不诚实。
- **Fluctuations** – variations or oscillations; rises and falls. .
- 波动 – 变化或振荡;起伏不定。
- **Monetary** – relating to money or finances, or to the mechanisms by which money is supplied to and circulates in the economy.
- 货币 – 与货币或金融有关，或与货币供应和在经济中流通的机制有关。
- **Nation-based currencies – [national currencies]** a system of money issued by a central bank and in common use within a particular nation or group of nations; examples are United States dollar (USD), Chinese renminbi (RMB or CNY), European Euro (EUR), British pound sterling (GBP), and Japanese yen (JPY).
- 以国家为基础的货币 – [国家货币]由中央银行发行并在特定国家或国家集团中共同使用的货币系统;例如美元（USD），人民币（人民币或人民币），欧洲欧元（EUR），英镑（GBP）和日元（JPY）。
- **Underground cult** – hidden or mysterious group of people sharing an excessive devotion toward a particular person, belief, or thing.
- 地下小众圈 – 隐藏或神秘的一群人对某个人，信仰或事物过度投入。