

2024_“ShuWei Cup”

Problem D: Evaluation of Urban Resilience and Sustainable Development Capacity

The intensification of China's aging population trend and the first occurrence of negative population growth in 2022 suggest that the country will experience a population decline trend for a long period in the future. This trend is bound to impact the high-quality and sustainable development of many cities, especially secondary and tertiary cities, where the effects could be multifaceted. At the same time, the increasing frequency of extreme global climate events and the current economic downturn will pose unprecedented challenges to the resilience of urban development.

Using a combination of web crawler and field research, we have obtained the basic information on properties for sale in City 1 and City 2 on a specific day from 58.com, as shown in Appendix 1 and 2. Further, Appendix 3 and 4 provide the POI data for some basic services in City 1 and City 2 for a particular year. Please use these data to conduct specific optimization and modeling for the following four problems.

Problem (1): Can you develop specific projections of future housing prices in different areas of City 1 and City 2, and specific estimates of the total existing housing stock in these two cities, taking into account the data above and the data that can be collected on the Internet, such as population and GDP?

Problem (2): Please conduct a quantitative analysis of the service levels in different sectors of City 1 and City 2, and extract the common and unique characteristics of these two cities, along with their respective strengths and weaknesses.

Problem (3): Using the data in Appendix 3 and 4, assess the resilience of both cities in responding to extreme weather and emergencies, and quantitatively evaluate the cities' sustainable development capacity. Your model should explicitly identify the specific weaknesses of both cities, the key areas that require development in the future, and the short-term and long-term investment plans for the cities, given the constraints of limited financial resources.

Problem (4): Based on the analysis above, draft a future development plan for the two cities, not exceeding two pages. The plan should clearly outline the primary investment areas, investment amounts, and the expected improvements in the cities' level of smart city development.

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