MASA Hackathon: R-Volve

Problem Statement

Background of the Challenge

Countries around the world are experiencing profound demographic shifts due to rising life expectancy and declining birth rates. This transition is resulting in an aging population, which places increasing pressure on traditional pension systems. Many existing pension structures are relying on a shrinking workforce to support a growing number of retirees, making them financially unsustainable.

Without timely reforms, pension systems risk collapsing, leading to increased elderly poverty, higher government expenditures, and broader economic instability. To ensure long-term sustainability, policymakers need data-driven solutions that balance financial stability with adequate benefits for retirees.

In this hackathon, participants will use R to explore data, model trends, and develop innovative approaches to address the challenges facing pension systems. Can you leverage data science and analytics to help shape the future of retirement security?

Implementation

You are provided with a starter set of data, including demographics of the Malaysian population, employment and earnings data, as well as the pension system (EPF) data. These were sourced from DOSM, MBLS and KWSP respectively. Beware that there are some gap years in the data.

You are permitted to source any other publicly available data from the internet as you see fit, provided it is from credible sources. You may also refer to the following for more information on the application of actuarial methods to pension systems: Understanding the Basics of Actuarial Methods

You are required to analyse the long-term sustainability of Malaysia's pension system under various reform scenarios, such as adjusting contribution rates, retirement age, or benefit structures.

You will then need to develop a model to help policymakers and individuals in optimizing retirement savings based on income levels, age, risk tolerance, and expected returns.

Judging Criteria

Each submission shall be graded based on the following criteria each on a **scale of 1 (Poor) to 5 (Excellent)**.

Criteria	Description	Weight
Basic Pension Knowledge	Understanding of basic pension concepts including its purpose, mechanisms and benefits.	10%
Exploratory Data Analysis	Exploratory data analysis using R for better understanding of the demographics of the population in Malaysia, their employment and earnings as well as their pension contribution and savings.	20%
Sustainability Analysis	Appropriateness and robustness of projection models developed in R used to analyse the long-term sustainability of Malaysia's pension system under various reform scenarios.	25%
Modelling	Quality and practicability of optimisation model developed based on the results above, to help with optimizing retirement savings based on income levels, age, risk tolerance, and expected returns.	20%
Programming	Overall quality, accuracy, and readability of coding in R.	15%
Communication	Quality of deliverables and/or speaker's presentation.	10%
	Total	100%

Questions/Comments

Any questions or clarifications should be directed to the Organizer via email to hackathon@masassociation.org.