LABOUR FORCE PREDICTION ANALYSIS USING PARTICLE SWARM OPTIMIZATION AND BAT ALGORITHM : CASE STUDY IN MALAYSIA

FINAL PROJECT

Compiled in Order to Meet the Requirements for Completing Diploma IV Education in the Information Management Department State Polytechnic of Sriwijaya

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MOTTO AND DEDICATION

"Allah will elevate those who believe among you and those who have been given knowledge by several degrees".

(Q.S. Al-Mujadalah)

"If you don't go after what you want, you'll never have it. And if you don't ask, the answer is always no. Also if you don't step forward, you're always in the same place",

(Nora Roberts)

"The best way to get started is to quit talking and begin doing".

(Walt Disney)

"The expert in anything was once a beginner".

(Helen Hayes)

I dedicate it to:

1. Allah SWT is the Giver of Help
2. Myself, who has struggled to complete this report
3. Both Parents and Siblings
4. State Polytechnic of Sriwijaya and Management and Since University Extended Family
5. Pride Of Alma-mater
6. Supervisor
7. Comrade In Arms

ABSTRACK

The labour force is a group consisting of several people in a job. Nowdays, the problem of employment is still one of the problems that cannot be resolved. One of the factors that influence economic growth is the number and quality of the population and labour force. Population growth from year to year is relatively increasing, which will also affect the growth of the labour force. The increase in the size of the labor force has led to an increase in the need for jobs for Malaysian citizens. The available employment opportunities within the country are already limited, so that a portion of the labor force does not obtain domestic jobs, both in the formal and informal sectors. Therefore labour force prediction is needed to overcome this problem and ensure detailed planning can be carried out. Therefore, a web-based system will be developed to provide predictions for the future of the labor force in Malaysia where the data collection is obtained from data.gov.my, which is provided by the Jabatan Perangkaan Malaysia. Web-based information system is a web-based application. The app includes a database for managing data sets into predictive results. This system uses artificial intelligence methods, namely Particle Swarm Optimization (PSO) and Bat Algorithm (BA) which will be used to predict the workforce for the next five years. With this system, it is hoped that users can be more prepared for the labour force in the coming year so that they can reduce the number of unemployed in Malaysia.

Keywords : Labour Force, Particle Swarm Optimization, Bat Algorithm, Predict.

ABSTRAK

Angkatan kerja merupakan suatu kelompok yang terdiri dari beberapa orang dalam suatu pekerjaan. Saat ini permasalahan ketenagakerjaan masih menjadi salah satu permasalahan yang belum dapat diselesaikan. Salah satu faktor yang mempengaruhi pertumbuhan ekonomi adalah jumlah dan kualitas penduduk serta angkatan kerja. Pertumbuhan penduduk dari tahun ke tahun yang relatif meningkat, hal ini juga akan mempengaruhi pertumbuhan angkatan kerja. Meningkatnya jumlah angkatan kerja telah menyebabkan peningkatan kebutuhan pekerjaan bagi warga negara Malaysia. Kesempatan kerja yang tersedia di dalam negeri sudah terbatas, sehingga sebagian angkatan kerja tidak memperoleh pekerjaan dalam negeri, baik di sektor formal maupun informal. Oleh karena itu diperlukan prediksi angkatan kerja untuk mengatasi permasalahan tersebut dan memastikan perencanaan yang detail dapat dilakukan. Oleh karena itu, akan dikembangkan sistem berbasis web untuk memberikan prediksi masa depan angkatan kerja di Malaysia dimana pengumpulan datanya diperoleh dari data.gov.my yang disediakan oleh Jabatan Perangkaan Malaysia. Sistem informasi berbasis web adalah aplikasi berbasis web. Aplikasi ini menyertakan database untuk mengelola kumpulan data menjadi hasil prediktif. Sistem ini menggunakan metode kecerdasan buatan yaitu Particle Swarm Optimization (PSO) dan Bat Algorithm (BA) yang akan digunakan untuk memprediksi angkatan kerja lima tahun ke depan. Dengan sistem ini diharapkan pengguna dapat lebih siap menghadapi angkatan kerja di tahun mendatang sehingga dapat mengurangi jumlah pengangguran di Malaysia.

Kata Kunci : *Angkatan Kerja, , Particle Swarm Optimization, Bat Algorithm, Prediksi.*

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The author is aware that there are still mistakes and shortcomings in this final project. For this reason, the author requests recommendations and constructive criticism from all parties in order to make it even better in the future. Finally, in order to attain the desired results, the author expects that this final project will be helpful to readers, particularly students at State Polytechnic of Sriwijaya Informatics Management Department, and will deepen their understanding. Aamiin.

Palembang, August 29^{th} 2023

Writer

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