

ABSTRAK

Pemilihan 11 pasang rekaman gempa yang representatif adalah tahapan vital dalam rekayasa seismik untuk memastikan validitas Analisis Riwayat Waktu namun proses pengelolaan data gempa yang besar dan kompleks memerlukan metode seleksi yang akurat dan efisien dengan meminimalkan error spektral terhadap Spektrum Respons Target. Penelitian ini bertujuan untuk menentukan 11 pasang rekaman gempa paling representatif berdasarkan kriteria error minimum serta mengembangkan sistem pengolahan basis data relasional menggunakan Microsoft Access untuk mempercepat proses seleksi. Data akselerogram diskalakan intensitasnya (mSIL via MATLAB) dan data respons spektrumnya diinput ke dalam Microsoft Access, yang kemudian dirancang dengan relasi antar tabel untuk memfasilitasi query SQL yang otomatis mengidentifikasi dan mengurutkan pasangan gempa berdasarkan nilai error spektral terkecil. Hasil penelitian menunjukkan bahwa sistem basis data di Microsoft Access efektif mempermudah dan mempercepat seleksi data gempa, dan berhasil menentukan 11 pasang gempa dengan error minimum yang menghasilkan set data gempa yang lebih representatif untuk analisis respons struktur.

Kata Kunci: Rekaman Gempa Representatif, Error Minimum, Spektrum Respons Target, Microsoft Access, Analisis Seismik.

ABSTRACT

The selection of 11 representative earthquake record pairs is a vital stage in seismic engineering to ensure the validity of Time History Analysis, yet the process of managing large and complex earthquake data requires an accurate and efficient selection method by minimizing the spectral error against the Target Response Spectrum. This study aims to determine the 11 most representative earthquake record pairs based on the minimum error criterion and to develop a relational database processing system using Microsoft Access to accelerate the selection process. Accelerogram data were scaled for intensity (mSIL via MATLAB) and their response spectrum data were input into Microsoft Access, which was then designed with inter-table relations to facilitate automatic SQL queries that identify and rank earthquake pairs based on the smallest spectral error value. The results demonstrate that the Microsoft Access database system effectively simplified and accelerated the earthquake data selection, and successfully determined 11 minimum-error earthquake pairs, yielding a more representative earthquake dataset for structural response analysis.

Keywords: Representative Earthquake Records, Minimum Error, Target Response Spectrum, Microsoft Access, Seismic Analysis.