An Insite to the Probabilistic Assessment of Reserves in Conventional Reservoirs

Authors : Sai Sudarshan, Harsh Vyas, Riddhiman Sherlekar

Abstract : The oil and gas industry has been unwilling to adopt stochastic definition of reserves. Nevertheless, Monte Carlo simulation methods have gained acceptance by engineers, geoscientists and other professionals who want to evaluate prospects or otherwise analyze problems that involve uncertainty. One of the common applications of Monte Carlo simulation is the estimation of recoverable hydrocarbon from a reservoir.Monte Carlo Simulation makes use of random samples of parameters or inputs to explore the behavior of a complex system or process. It finds application whenever one needs to make an estimate, forecast or decision where there is significant uncertainty. First, the project focuses on performing Monte-Carlo Simulation on a given data set using U. S Department of Energy's MonteCarlo Software, which is a freeware e&p tool. Further, an algorithm for simulation has been developed for MATLAB and program performs simulation by prompting user for input distributions and parameters associated with each distribution (i.e. mean, st.dev, min., max., most likely, etc.). It also prompts user for desired probability for which reserves are to be calculated. The algorithm so developed and tested in MATLAB further finds implementation in Python where existing libraries on statistics and graph plotting have been imported to generate better outcome. With PyQt designer, codes for a simple graphical user interface have also been written. The graph so plotted is then validated with already available results from U.S DOE MonteCarlo Software.
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