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**QuantCloud: Enabling Big Data Complex Event Processing for Quantitative Finance through a Data-Driven Execution**

**Abstract**

Quantitative Finance (QF) utilizes increasingly sophisticated mathematic models and advanced computer techniques to predict the movement of global markets and price the derivatives. Today, the rise of QF requires an integrated toolchain of enabling technologies to carry out complex event processing on the explosive growth of market metadata. Inspired by this, we present a data-driven execution paradigm that untangles the dependencies of complex processing events, and integrate the paradigm with a big data infrastructure. This integrated platform is termed as QuantCloud. QuantCloud executes complex event processing in a data-driven mode and manages market data in a data-parallel mode. To show its performance, we develop a prototype and benchmark by applying real-world QF research models on NYSE market data. Using this prototype, we demonstrate this platform with an application to: (i) data cleaning and aggregating and (ii) data modeling: the autoregressive-moving average (ARMA) model. The results show that this platform obtains a high throughput (in the order of millions of tick messages per second) and a sub-microsecond latency; it fully executes data-dependent tasks through a data-driven execution. This platform offers financial engineers with new insights and enhanced capabilities for efficient incorporation of big data complex event processing technologies in their workflow