Peloton UDF Final Presentation

SeungHyun Lee, Yang Zhang, Zheyuan Bu

Proposed Goals

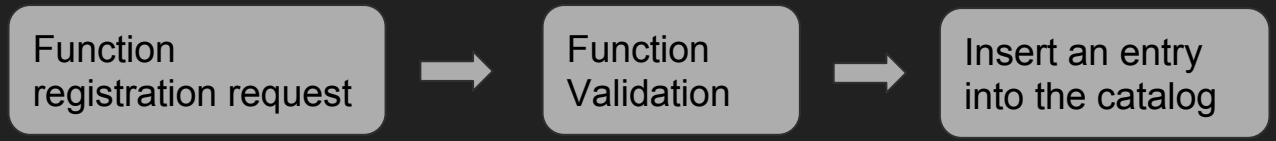
- 75%: Basic support for C UDFs
- 100%: Test code, benchmark, basic support for stored procedure (pl/pgSQL)
- 125%: Make stored procedure support reliable (not done)

Current Progress

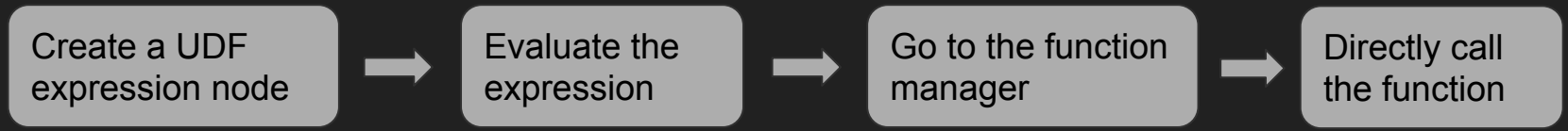
- Support for C UDFs
- Support for PL/PGSQL
- Testing Code - SQL scripts and expected outputs
- Benchmark
  - C vs PL/pgSQL UDF functions
  - stored procedure vs prepared statement with batch update

Overview of executing a UDF

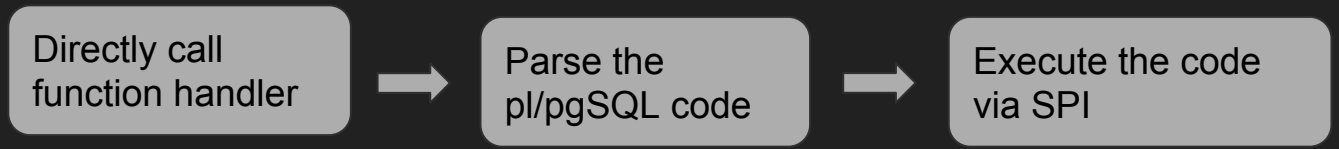
- Registering function



- Calling C UDF



- Calling pl/pgSQL UDF



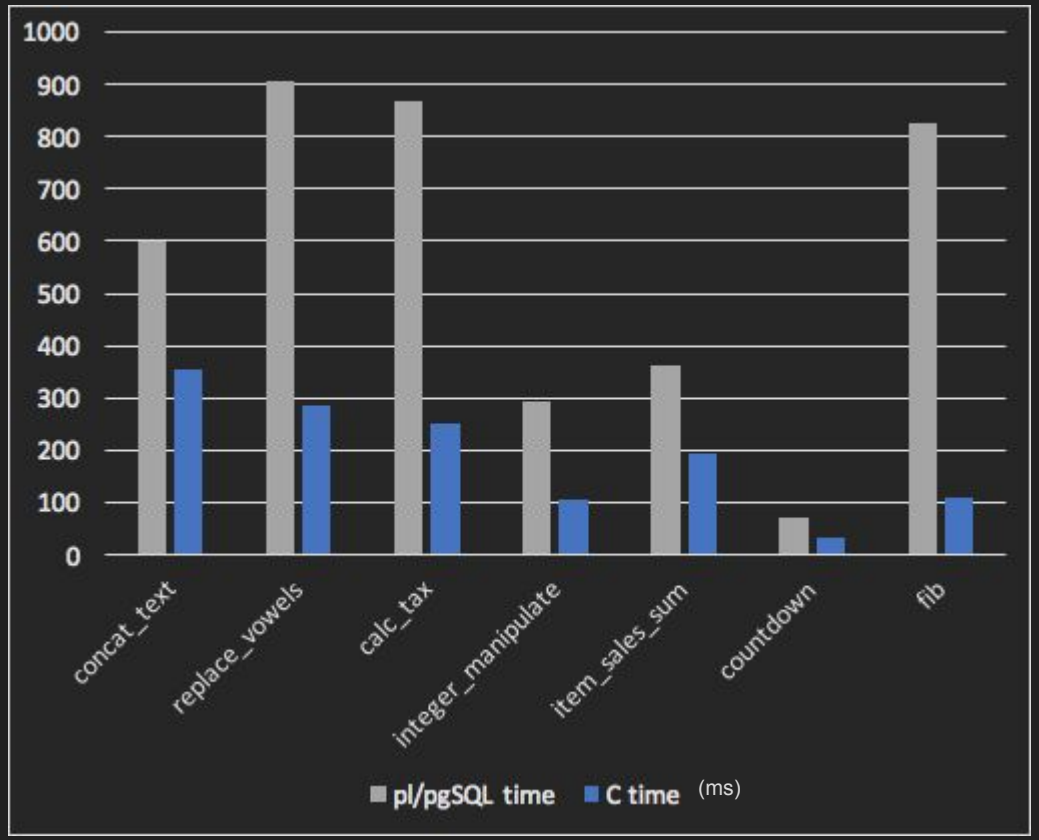
Testing

- Issue : UDF components are not easily separable
  - Components are closely interleaved.
  - C UDF functions are called directly using the function pointer.
  - SPI layer is dependent on the query execution code.
  - PL/PGSQL handler is a C UDF function that uses SPI layer.

- Our approach
  - Write SQL scripts that uses UDFs and compare with the expected output.
  - Make UDFs be called at different places.
  - Use different types of input/output data.

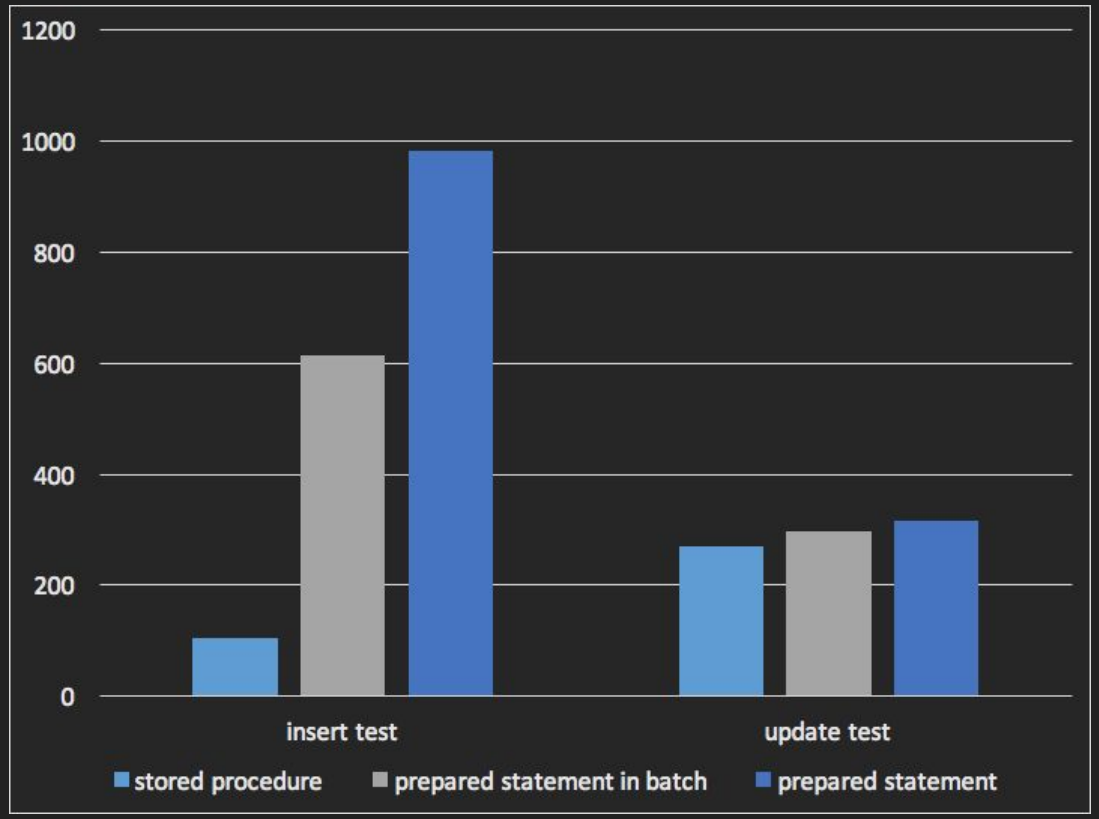
DEMO

UDF Experiment - C vs pl/pgSQL



String operations	concat_text
	replace_vowels
Float calculations	calc_tax
Integer calculations	integer_manipulate
SQL Queries	item_sales_sum
Loops & control flow	countdown
	fib

UDF Experiment - Stored procedure vs Prepared Stmt



Future Direction

- Remove the dependency of postgres catalog system
- Add the native support for pl/pgSQL (non-sandboxed).
    - Instead of registering the handler as a C UDF, directly process UDFs to make it faster.