

Vancouver Stock Exchange Rounding Error Simulation

Python Code:

```
# Vancouver Stock Exchange rounding error simulation

# Starting index value
true_index = 1000.000
stored_index = 1000.000

# Constant increase per trade (for simplicity)
delta = 0.000456

# Run the simulation for 10,000 trades
for trade in range(10000):
    true_index += delta                # true continuous value
    stored_index += delta              # stored value calculation
    stored_index = int(stored_index * 1000) / 1000 # simulate truncation to 3 decimals

# Display results
print("True index value: ", round(true_index, 6))
print("Stored index value: ", round(stored_index, 6))
print("Difference: ", round(true_index - stored_index, 6))
```

Simulation Results:

True index value: 1004.56

Stored index value: 1000.0

Difference: 4.56

This simulation replicates the rounding error that occurred in the Vancouver Stock Exchange (1983–1985). The index value, starting at 1000.000, was repeatedly recalculated and truncated to three decimal places, causing a small but consistent loss of value over time. After 10,000 iterations, the difference between the true and truncated values reached 4.56 points, illustrating how small rounding errors can accumulate and distort financial indices.