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% Run the GraphBLAS demo2
gbdemo2

 GBDEMO2 Extreme performance differences: GraphBLAS vs MATLAB.

  Usage:

        gbdemo2             % uses a default bnz = 6000
        gbdemo2 (20000)     % uses bnz = 20000

  The GraphBLAS operations used in gbdemo are perhaps 3x to 50x faster
  than the corresponding MATLAB operations, depending on how many
cores
  your computer has.  Here's an example where GraphBLAS is
asymptotically
  far faster than MATLAB R2019a: a simple assignment for a large
matrix
  C:

        C(I,J) = A

  The matrix C is constructed via C = kron (B,B) where nnz (B) is
roughly
  the bnz provided on input (with a default of bnz = 6000), so that C
  will have about bnz^2 entries, or 36 million by default.  I and J
are
  chosen randomly, and A is 5000-by-5000.

  When the problem becomes large, MATLAB will take a very long time.
If
  you have enough memory, and want to see higher speedups in
GraphBLAS,
  increase bnz (and be prepared to wait even longer).  With the
default
  bnz = 6000, this test takes about 4GB of RAM.

  On my Dell XPS 4-core laptop (Intel(R) Core(TM) i7-8565U, 16GB RAM),
  using MATLAB R2019a, when C becomes 9 million by 9 million, the
  computation C(I,J)=A for MATLAB matrices C, I, J, and A takes
several
  minutes, whereas GraphBLAS takes less than a second, or about 500x
  faster than MATLAB.  On a desktop with an Intel(R) Xeon(R) CPU
E5-2698
  v4 @ 2.20GHz with 20 hardware cores, the speedup over MATLAB is even
  more dramatic (up to 2,660x has been observed).

  See also gb.assign, subsasgn.


# of threads used in GraphBLAS: 4
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C(I,J)=A where C is 1 million -by- 1 million
with 35.7126 million entries:

    A is 5000-by-5000 with 49954 entries
    setup time:     0.278294 sec
    GraphBLAS time: 0.26664 sec
    Starting MATLAB ... please wait ...
    MATLAB time:    0.321341 sec
    Speedup of GraphBLAS over MATLAB: 1.20515
    check time:     0.2562 sec
    all tests passed

C(I,J)=A where C is 4 million -by- 4 million
with 35.8202 million entries:

    A is 5000-by-5000 with 49954 entries
    setup time:     0.366056 sec
    GraphBLAS time: 0.306905 sec
    Starting MATLAB ... please wait ...
    MATLAB time:    0.29961 sec
    Speedup of GraphBLAS over MATLAB: 0.97623
    check time:     0.266389 sec
    all tests passed

C(I,J)=A where C is 9 million -by- 9 million
with 35.928 million entries:

    A is 5000-by-5000 with 49954 entries
    setup time:     0.333813 sec
    GraphBLAS time: 0.371646 sec
    Starting MATLAB ... please wait ...
    MATLAB time:    189.586 sec
    Speedup of GraphBLAS over MATLAB: 510.125
    check time:     0.465536 sec
    all tests passed

C(I,J)=A where C is 16 million -by- 16 million
with 35.916 million entries:

    A is 5000-by-5000 with 49954 entries
    setup time:     0.395067 sec
    GraphBLAS time: 0.447943 sec
    Starting MATLAB ... please wait ...
    MATLAB time:    205.543 sec
    Speedup of GraphBLAS over MATLAB: 458.86
    check time:     0.352535 sec
    all tests passed

C(I,J)=A where C is 25 million -by- 25 million
with 35.964 million entries:

    A is 5000-by-5000 with 49954 entries
    setup time:     0.45334 sec
    GraphBLAS time: 0.438889 sec
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    Starting MATLAB ... please wait ...
    MATLAB time:    218.525 sec
    Speedup of GraphBLAS over MATLAB: 497.906
    check time:     0.422354 sec
    all tests passed

C(I,J)=A where C is 36 million -by- 36 million
with 35.976 million entries:

    A is 5000-by-5000 with 49954 entries
    setup time:     0.499349 sec
    GraphBLAS time: 0.705424 sec
    Starting MATLAB ... please wait ...
    MATLAB time:    238.816 sec
    Speedup of GraphBLAS over MATLAB: 338.542
    check time:     0.45375 sec
    all tests passed
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