Query plans of RDF-star-based-approach for GraphDB

Query 1

SELECT ?id ?lbl
{

  { # ----- Begin optimization group 1 -----

    ?n1 ns1:name "XU JIE" . # Collection size: 6.0 Predicate collection size: 466139.0   Unique subjects: 466139.0   Unique objects: 335677.0   Current complexity: 6.0
    ?n1 rdfs:label ?lbl . #   Collection size: 559600.0   Predicate collection size: 559600.0   Unique subjects: 559600.0   Unique objects: 4.0 Current complexity: 6.0

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 6.0

  OPTIONAL
  {

    { # ----- Begin optimization group 2 -----

      ?n1 ns1:node_id ?id . #   Collection size: 559600.0   Predicate collection size: 559600.0   Unique subjects: 559600.0   Unique objects: 559600.0   Current complexity: 1.0

    } # ----- End optimization group 2 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0
  }
}

Query 2

SELECT ?lbl ?country
{

  { # ----- Begin optimization group 1 -----

    ?n ns1:name "EL PORTADOR" . #   Collection size: 9325.0   Predicate collection size: 466139.0   Unique subjects: 466139.0 Unique objects: 335677.0   Current complexity: 9325.0
    ?n rdfs:label ?lbl . #   Collection size: 559600.0   Predicate collection size: 559600.0   Unique subjects: 559600.0   Unique objects: 4.0 Current complexity: 9325.0
    ?n ns1:countries ?country . #   Collection size: 462798.0   Predicate collection size: 462798.0   Unique subjects: 462798.0 Unique objects: 311.0   Current complexity: 9325.0
    FILTER (?country != "")

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 9325.0

}

\# NOTE: Optimization groups are evaluated one after another exactly in the given order.
\# If there are too many optimization groups consisting of a single statement pattern,
\# then one should try to relocate the following clauses by hand:
\# VALUES, BIND, OPTIONAL, property paths with '*' and/or '+' (the latter can be also surrounded with brackets).
\# Sub-SELECTs will always be evaluated first."

Query 3
SELECT DISTINCT ?lbl
{

  { # ----- Begin optimization group 1 -----

    ?n rdfs:label ?lbl . #   **Collection size: 559600.0**   **Predicate collection size: 559600.0**   **Unique subjects: 559600.0**
          Unique objects: 4.0 **Current complexity: 559600.0**

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 559600.0

}

Query 4
SELECT DISTINCT ?lbl
{

  { # ----- Begin optimization group 1 -----

    ?n ?lbl ?n1 . #   **Collection size: 8261110.0**   **Predicate collection size: 8261110.0**   **Unique subjects: 7987353.0**   **Unique objects: 1575797.0**   **Current complexity: 8261110.0**
    FILTER (!IS_LITERAL(?n1))

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 8261110.0

}

Query 5
SELECT ?name ?lbl
{

  { # ----- Begin optimization group 1 -----

    ?n1 ns1:name "ORION HOUSE SERVICES (HK) LIMITED" . #   **Collection size: 2.0** **Predicate collection size: 466139.0**
          Unique subjects: 466139.0   **Unique objects: 335677.0**   **Current complexity: 2.0**
    ?n1 ns1:intermediary_of ?n2 . #   **Collection size: 213634.0**   **Predicate collection size: 213634.0**   **Unique subjects: 14074.0**   **Unique objects: 213634.0**   **Current complexity: 30.358675571976693**
    ?n2 rdfs:label ?lbl . #   **Collection size: 559600.0**   **Predicate collection size: 559600.0**   **Unique subjects: 559600.0**
          Unique objects: 4.0 **Current complexity: 30.358675571976693**

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 30.358675571976693

  OPTIONAL
  {

    { # ----- Begin optimization group 2 -----

      ?n2 ns1:name ?name . #   **Collection size: 466139.0**   **Predicate collection size: 466139.0**   **Unique subjects: 466139.0**
          Unique objects: 335677.0   **Current complexity: 1.0**

    } # ----- End optimization group 2 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
}

Query 6

```
SELECT ?lbl1 ?name ?link ?lbl2
{
 {

  { # ----- Begin optimization group 1 -----

    ?n1 ns1:name "BEARER" . #         Collection size: 497.0  Predicate collection size: 466139.0         Unique subjects: 466139.0
           Unique objects: 335677.0       Current complexity: 497.0
    ?n1 rdfs:label ?lbl1 . #       Collection size: 559600.0         Predicate collection size: 559600.0         Unique subjects: 559600.0
           Unique objects: 4.0   Current complexity: 497.0
    ?n1 ns1:officer\_of ?n2 . #   Collection size: 292749.0         Predicate collection size: 292749.0         Unique subjects: 238080.0
           Unique objects: 120843.0       Current complexity: 611.1233744959678
    ?n2 rdfs:label ?lbl2 . #       Collection size: 559600.0         Predicate collection size: 559600.0         Unique subjects: 559600.0
           Unique objects: 4.0   Current complexity: 611.1233744959678

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 611.1233744959678

  OPTIONAL
  {

   { # ----- Begin optimization group 2 -----

    ?n2 ns1:name ?name . #    Collection size: 466139.0         Predicate collection size: 466139.0         Unique subjects: 466139.0
           Unique objects: 335677.0       Current complexity: 1.0

   } # ----- End optimization group 2 -----
   # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

   { # ----- Begin optimization group 3 -----

     TRIPLE ?_anon_a053f02f_8aa4_4fb3_8113_bee2aa10dd6d { ?n1 ns1:officer\_of ?n2 } . # Collection size: 292749.0         Predicate
collection size: 292749.0         Unique subjects: 238080.0       Unique objects: 120843.0         Current complexity: 1.0
     ?_anon_a053f02f_8aa4_4fb3_8113_bee2aa10dd6d ns1:link ?link . #   Collection size: 657530.0         Predicate collection size:
657530.0   Unique subjects: 657488.0         Unique objects: 33.0 Current complexity: 1.0000638794928576

   } # ----- End optimization group 3 -----
   # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576

  }
 }
 UNION
 {

  { # ----- Begin optimization group 4 -----

    ?n1 ns1:name "The Bearer" . #         Collection size: 434.0  Predicate collection size: 466139.0         Unique subjects: 466139.0
           Unique objects: 335677.0       Current complexity: 434.0
    ?n1 rdfs:label ?lbl1 . #       Collection size: 559600.0         Predicate collection size: 559600.0         Unique subjects: 559600.0
           Unique objects: 4.0   Current complexity: 434.0
    ?n1 ns1:officer\_of ?n2 . #   Collection size: 292749.0         Predicate collection size: 292749.0         Unique subjects: 238080.0
           Unique objects: 120843.0       Current complexity: 533.65703125
    ?n2 rdfs:label ?lbl2 . #       Collection size: 559600.0         Predicate collection size: 559600.0         Unique subjects: 559600.0
           Unique objects: 4.0   Current complexity: 533.65703125

  } # ----- End optimization group 4 -----
  # ESTIMATED NUMBER OF ITERATIONS: 533.65703125

  OPTIONAL
```

```
{

  { # ----- Begin optimization group 5 -----

    ?n2 ns1:name ?name . #    Collection size: 466139.0        Predicate collection size: 466139.0        Unique subjects: 466139.0
              Unique objects: 335677.0        Current complexity: 1.0

  } # ----- End optimization group 5 -----
  # ESTIMATED NUMBER OF ITERATIONS: 1.0


  }
  OPTIONAL
  {

  { # ----- Begin optimization group 6 -----

    TRIPLE ?_anon_0d59b9c2_1e0e_4098_9c5f_9c1271655cb8 { ?n1 ns1:officer\_of ?n2 } . # Collection size: 292749.0        Predicate
collection size: 292749.0        Unique subjects: 238080.0        Unique objects: 120843.0        Current complexity: 1.0
    ?_anon_0d59b9c2_1e0e_4098_9c5f_9c1271655cb8 ns1:link ?link . #   Collection size: 657530.0        Predicate collection size:
657530.0   Unique subjects: 657488.0        Unique objects: 33.0 Current complexity: 1.0000638794928576

  } # ----- End optimization group 6 -----
  # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576


  }
 }
}
```

Query 7
SELECT ?lbl1 ?link ?lbl2 ?entity_name
```
{
 {

  { # ----- Begin optimization group 1 -----

    ?_anon_c68cd2d8_b8c0_4e97_a26c_1d7e4c429a30 ns1:end\_date "11-APR-2014" . #        Collection size: 64.0  Predicate collection
size: 76749.0        Unique subjects: 73861.0        Unique objects: 6367.0        Current complexity: 64.0
    TRIPLE ?_anon_c68cd2d8_b8c0_4e97_a26c_1d7e4c429a30 { ?n1 ?r1 ?n2 } . #   Collection size: 657488.0        Predicate collection
size: 657488.0        Unique subjects: 403171.0        Unique objects: 427919.0        Current complexity: 4.2079232E7
    ?n1 rdfs:label ?lbl1 . #        Collection size: 559600.0        Predicate collection size: 559600.0        Unique subjects: 559600.0
              Unique objects: 4.0  Current complexity: 4.2079232E7
    ?n2 rdfs:label ?lbl2 . #        Collection size: 559600.0        Predicate collection size: 559600.0        Unique subjects: 559600.0
              Unique objects: 4.0  Current complexity: 4.2079232E7
    ?n2 ns1:status "Active" . # Collection size: 55728.0        Predicate collection size: 226252.0        Unique subjects: 226252.0
              Unique objects: 26.0 Current complexity: 4.2079232E7
    ?n1 ns1:name "THE BEARER" . #    Collection size: 70871.0        Predicate collection size: 466139.0        Unique subjects:
466139.0  Unique objects: 335677.0        Current complexity: 4.2079232E7

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 4.2079232E7

  OPTIONAL
  {

  { # ----- Begin optimization group 2 -----

    TRIPLE ?_anon_dee4e685_1deb_4f1e_9982_3fe65815fabd { ?n1 ?r1 ?n2 } . #   Collection size: 657488.0        Predicate collection
size: 657488.0        Unique subjects: 403171.0        Unique objects: 427919.0        Current complexity: 1.0
    ?_anon_dee4e685_1deb_4f1e_9982_3fe65815fabd ns1:link ?link . #   Collection size: 657530.0        Predicate collection size:
657530.0   Unique subjects: 657488.0        Unique objects: 33.0 Current complexity: 1.0000638794928576

  } # ----- End optimization group 2 -----
  # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576
```

```
    }
  OPTIONAL
  {

    { # ----- Begin optimization group 3 -----

       ?n2 ns1:name ?entity_name . #        Collection size: 466139.0        Predicate collection size: 466139.0        Unique subjects:
466139.0   Unique objects: 335677.0        Current complexity: 1.0

    } # ----- End optimization group 3 -----
      # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
 }
  UNION
  {

    { # ----- Begin optimization group 4 -----

       ?n1 ns1:name "THE BEARER" . #        Collection size: 70871.0        Predicate collection size: 466139.0        Unique subjects:
466139.0   Unique objects: 335677.0        Current complexity: 70871.0
       TRIPLE ?_anon_58d40646_a88b_41e2_b763_eb3cba695c1a { ?n1 ?r1 ?n2 } . #   Collection size: 657488.0        Predicate collection
size: 657488.0        Unique subjects: 403171.0        Unique objects: 427919.0        Current complexity: 115575.85254891845
       ?_anon_58d40646_a88b_41e2_b763_eb3cba695c1a ns1:end\_date "29-DEC-2009" . #        Collection size: 824.0Predicate collection
size: 76749.0        Unique subjects: 73861.0        Unique objects: 6367.0        Current complexity: 115575.85254891845
      ?n1 rdfs:label ?lbl1 . #        Collection size: 559600.0        Predicate collection size: 559600.0        Unique subjects: 559600.0
          Unique objects: 4.0   Current complexity: 115575.85254891845
      ?n2 rdfs:label ?lbl2 . #        Collection size: 559600.0        Predicate collection size: 559600.0        Unique subjects: 559600.0
          Unique objects: 4.0   Current complexity: 115575.85254891845
      ?n2 ns1:status "Defaulted" . #        Collection size: 100090.0        Predicate collection size: 226252.0        Unique subjects:
226252.0   Unique objects: 26.0   Current complexity: 115575.85254891845

    } # ----- End optimization group 4 -----
     # ESTIMATED NUMBER OF ITERATIONS: 115575.85254891845

    OPTIONAL
    {

    { # ----- Begin optimization group 5 -----

       TRIPLE ?_anon_09d7c2e8_0740_4548_ac61_6f5f514fc2a8 { ?n1 ?r1 ?n2 } . #   Collection size: 657488.0        Predicate collection
size: 657488.0        Unique subjects: 403171.0        Unique objects: 427919.0        Current complexity: 1.0
       ?_anon_09d7c2e8_0740_4548_ac61_6f5f514fc2a8 ns1:link ?link . #   Collection size: 657530.0        Predicate collection size:
657530.0   Unique subjects: 657488.0        Unique objects: 33.0   Current complexity: 1.0000638794928576

    } # ----- End optimization group 5 -----
      # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 6 -----

       ?n2 ns1:name ?entity_name . #        Collection size: 466139.0        Predicate collection size: 466139.0        Unique subjects:
466139.0   Unique objects: 335677.0        Current complexity: 1.0

    } # ----- End optimization group 6 -----
      # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
 }
}
```

Query 8

SELECT ?lbl1 ?name ?link ?address
{

  { # ----- Begin optimization group 1 -----

    ?n1 ns1:registered_address ?n3 . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects: 151017.0   Unique objects: 93442.0   Current complexity: 151105.0
    ?n1 rdfs:label ?lbl1 . #   Collection size: 559600.0   Predicate collection size: 559600.0   Unique subjects: 559600.0   Unique objects: 4.0   Current complexity: 151105.0

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 151105.0

  OPTIONAL
  {

    { # ----- Begin optimization group 2 -----

    ?n1 ns1:name ?name . #   Collection size: 466139.0   Predicate collection size: 466139.0   Unique subjects: 466139.0   Unique objects: 335677.0   Current complexity: 1.0

    } # ----- End optimization group 2 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 3 -----

    TRIPLE ?_anon_7db7263a_820e_45c9_ad70_59935dd6ef7b { ?n1 ns1:registered_address ?n3 } . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects: 151017.0   Unique objects: 93442.0   Current complexity: 1.0
    ?_anon_7db7263a_820e_45c9_ad70_59935dd6ef7b ns1:link ?link . #   Collection size: 657530.0   Predicate collection size: 657530.0   Unique subjects: 657488.0   Unique objects: 33.0 Current complexity: 1.0000638794928576

    } # ----- End optimization group 3 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 4 -----

    ?n3 ns1:address ?address . #   Collection size: 93453.0   Predicate collection size: 93453.0   Unique subjects: 93453.0   Unique objects: 93445.0   Current complexity: 1.0

    } # ----- End optimization group 4 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
}

Query 9

SELECT ?lbl ?name ?link1 ?first_address ?link2 ?second_address
{

  { # ----- Begin optimization group 1 -----

    ?n1 ns1:registered_address ?n2 . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects:
151017.0   Unique objects: 93442.0   Current complexity: 151105.0
    ?n1 ns1:registered_address ?n3 . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects:
151017.0   Unique objects: 93442.0   Current complexity: 151193.0512789951
    FILTER (?n2 != ?n3)
    ?n1 rdfs:label ?lbl . #   Collection size: 559600.0   Predicate collection size: 559600.0   Unique subjects: 559600.0
        Unique objects: 4.0   Current complexity: 151193.0512789951

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 151193.0512789951

  OPTIONAL
  {

    { # ----- Begin optimization group 2 -----

      ?n1 ns1:name ?name . #   Collection size: 466139.0   Predicate collection size: 466139.0   Unique subjects: 466139.0
        Unique objects: 335677.0   Current complexity: 1.0

    } # ----- End optimization group 2 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 3 -----

      TRIPLE ?_anon_8111a092_86e5_46b0_a6f2_9a18d91d0586 { ?n1 ns1:registered_address ?n2 } . #   Collection size: 151105.0
            Predicate collection size: 151105.0   Unique subjects: 151017.0   Unique objects: 93442.0   Current complexity:
1.0
      ?_anon_8111a092_86e5_46b0_a6f2_9a18d91d0586 ns1:link ?link1 . #   Collection size: 657530.0   Predicate collection size:
657530.0   Unique subjects: 657488.0   Unique objects: 33.0 Current complexity: 1.0000638794928576

    } # ----- End optimization group 3 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 4 -----

      ?n2 ns1:address ?first_address . #   Collection size: 93453.0   Predicate collection size: 93453.0   Unique subjects:
93453.0   Unique objects: 93445.0   Current complexity: 1.0

    } # ----- End optimization group 4 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 5 -----

      TRIPLE ?_anon_f13ef0e5_aa28_42c2_b111_6f5227e8f11a { ?n1 ns1:registered_address ?n3 } . #   Collection size: 151105.0
            Predicate collection size: 151105.0   Unique subjects: 151017.0   Unique objects: 93442.0   Current complexity:
1.0

?_anon_f13ef0e5_aa28_42c2_b111_6f5227e8f11a ns1:link ?link2 . #   Collection size: 657530.0   Predicate collection size: 657530.0   Unique subjects: 657488.0   Unique objects: 33.0 Current complexity: 1.0000638794928576

    } # ----- End optimization group 5 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 6 -----

      ?n3 ns1:address ?second_address . #   Collection size: 93453.0   Predicate collection size: 93453.0   Unique subjects: 93453.0   Unique objects: 93445.0   Current complexity: 1.0

    } # ----- End optimization group 6 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
}

Query 10

SELECT ?link1 ?link2 ?address
{

  { # ----- Begin optimization group 1 -----

    ?n1 ns1:registered_address ?n3 . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects: 151017.0 Unique objects: 93442.0   Current complexity: 151105.0
    ?n1 rdfs:label "officer" . #   Collection size: 238402.0   Predicate collection size: 559600.0   Unique subjects: 559600.0 Unique objects: 4.0 Current complexity: 151105.0
    ?n2 ns1:registered_address ?n3 . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects: 151017.0 Unique objects: 93442.0   Current complexity: 244351.80138481627
    ?n2 rdfs:label "entity" . #   Collection size: 213634.0   Predicate collection size: 559600.0   Unique subjects: 559600.0 Unique objects: 4.0 Current complexity: 244351.80138481627

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 244351.80138481627

  OPTIONAL
  {

    { # ----- Begin optimization group 2 -----

      TRIPLE ?_anon_41882a34_b947_4899_b675_eeed0775b199 { ?n1 ns1:registered_address ?n3 } . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects: 151017.0   Unique objects: 93442.0   Current complexity: 1.0
      ?_anon_41882a34_b947_4899_b675_eeed0775b199 ns1:link ?link1 . # Collection size: 657530.0   Predicate collection size: 657530.0   Unique subjects: 657488.0   Unique objects: 33.0 Current complexity: 1.0000638794928576

    } # ----- End optimization group 2 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 3 -----

      TRIPLE ?_anon_7fbfdcd9_335c_40a7_8b76_49d30d67a79f { ?n2 ns1:registered_address ?n3 } . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects: 151017.0   Unique objects: 93442.0   Current complexity: 1.0
      ?_anon_7fbfdcd9_335c_40a7_8b76_49d30d67a79f ns1:link ?link2 . # Collection size: 657530.0   Predicate collection size: 657530.0   Unique subjects: 657488.0   Unique objects: 33.0 Current complexity: 1.0000638794928576

```
    } # ----- End optimization group 3 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576


  }
  OPTIONAL
  {

    { # ----- Begin optimization group 4 -----

      ?n3 ns1:address ?address . #        Collection size: 93453.0        Predicate collection size: 93453.0        Unique subjects:
93453.0    Unique objects: 93445.0    Current complexity: 1.0

    } # ----- End optimization group 4 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
}
```

Query 11

```
SELECT ?name ?valid ?sourceID
{

  { # ----- Begin optimization group 1 -----

    ?n1 rdfs:label "intermediary" . #        Collection size: 14110.0        Predicate collection size: 559600.0        Unique subjects:
559600.0  Unique objects: 4.0  Current complexity: 14110.0
    ?n1 ?r1 ?n2 . #    Collection size: 8261110.0        Predicate collection size: 8261110.0        Unique subjects: 7987353.0    Unique
objects: 1575797.0    Current complexity: 14593.603425314994
    ?n2 rdfs:label "entity" . #    Collection size: 213634.0        Predicate collection size: 559600.0        Unique subjects: 559600.0
          Unique objects: 4.0  Current complexity: 14593.603425314994
    ?n2 ?r2 ?n3 . #    Collection size: 8261110.0        Predicate collection size: 8261110.0        Unique subjects: 7987353.0    Unique
objects: 1575797.0    Current complexity: 15093.781781386642
    ?n3 rdfs:label "address" . #  Collection size: 93454.0        Predicate collection size: 559600.0        Unique subjects: 559600.0
          Unique objects: 4.0  Current complexity: 15093.781781386642
    ?n4 ?r3 ?n3 . #    Collection size: 8261110.0        Predicate collection size: 8261110.0        Unique subjects: 7987353.0    Unique
objects: 1575797.0    Current complexity: 79129.0956969908
    ?n4 rdfs:label "officer" . #    Collection size: 238402.0        Predicate collection size: 559600.0        Unique subjects: 559600.0
          Unique objects: 4.0  Current complexity: 79129.0956969908

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 79129.0956969908

  OPTIONAL
  {

    { # ----- Begin optimization group 2 -----

      TRIPLE ?_anon_6fc1cddf_8937_4fa9_8086_bfc33cd1ad71 { ?n1 ?r1 ?n2 } . #    Collection size: 657488.0        Predicate collection
size: 657488.0        Unique subjects: 403171.0        Unique objects: 427919.0        Current complexity: 1.0
      ?_anon_6fc1cddf_8937_4fa9_8086_bfc33cd1ad71 ns1:valid\_until ?valid . #        Collection size: 1211778.0        Predicate collection
size: 1211778.0        Unique subjects: 1211778.0        Unique objects: 2.0  Current complexity: 1.0

    } # ----- End optimization group 2 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 3 -----

      TRIPLE ?_anon_300505d3_30a4_4e22_b780_0f4f42bb577c { ?n1 ?r1 ?n2 } . #    Collection size: 657488.0        Predicate collection
size: 657488.0        Unique subjects: 403171.0        Unique objects: 427919.0        Current complexity: 1.0
```

?_anon_300505d3_30a4_4e22_b780_0f4f42bb577c ns1:sourceID ?sourceID . #   Collection size: 1217088.0   Predicate collection size: 1217088.0   Unique subjects: 1217088.0   Unique objects: 1.0 Current complexity: 1.0

  } # ----- End optimization group 3 -----
  # ESTIMATED NUMBER OF ITERATIONS: 1.0

 }
 OPTIONAL
 {

  { # ----- Begin optimization group 4 -----

   ?n1 ns1:name ?name . #   Collection size: 466139.0   Predicate collection size: 466139.0   Unique subjects: 466139.0
       Unique objects: 335677.0   Current complexity: 1.0

  } # ----- End optimization group 4 -----
  # ESTIMATED NUMBER OF ITERATIONS: 1.0

 }
}

Query 12.

SELECT ?officer_name ?link1 ?officer2_name ?link2 ?entity_name ?intermediary_name ?valid_until ?e_name
{

  { # ----- Begin optimization group 1 -----

   ?n1 rdfs:label "officer" . #   Collection size: 238402.0   Predicate collection size: 559600.0   Unique subjects: 559600.0
       Unique objects: 4.0 Current complexity: 238402.0
   ?n1 ns1:officer_of ?n2 . #   Collection size: 292749.0   Predicate collection size: 292749.0   Unique subjects: 238080.0
       Unique objects: 120843.0   Current complexity: 293144.9390877016
   ?n2 rdfs:label "officer" . #   Collection size: 238402.0   Predicate collection size: 559600.0   Unique subjects: 559600.0
       Unique objects: 4.0 Current complexity: 293144.9390877016
   ?n2 ns1:registered_address ?n3 . #   Collection size: 151105.0   Predicate collection size: 151105.0   Unique subjects: 151017.0 Unique objects: 93442.0   Current complexity: 293315.75929098815
   ?n3 rdfs:label "address" . # Collection size: 93454.0   Predicate collection size: 559600.0   Unique subjects: 559600.0
       Unique objects: 4.0 Current complexity: 293315.75929098815
   ?n2 ns1:officer_of ?n4 . #   Collection size: 292749.0   Predicate collection size: 292749.0   Unique subjects: 238080.0
       Unique objects: 120843.0   Current complexity: 360668.24267757684
   ?n4 rdfs:label "entity" . #   Collection size: 213634.0   Predicate collection size: 559600.0   Unique subjects: 559600.0
       Unique objects: 4.0 Current complexity: 360668.24267757684
   ?n5 ns1:intermediary_of ?n4 . #   Collection size: 213634.0   Predicate collection size: 213634.0   Unique subjects:
14074.0   Unique objects: 213634.0   Current complexity: 360668.24267757684
   ?n5 rdfs:label "intermediary" . #   Collection size: 14110.0   Predicate collection size: 559600.0   Unique subjects:
559600.0 Unique objects: 4.0 Current complexity: 360668.24267757684
   ?n5 ns1:intermediary_of ?n6 . #   Collection size: 213634.0   Predicate collection size: 213634.0   Unique subjects:
14074.0   Unique objects: 213634.0   Current complexity: 5474705.084281757
    FILTER (?n4 != ?n6)
   ?n6 rdfs:label "entity" . #   Collection size: 213634.0   Predicate collection size: 559600.0   Unique subjects: 559600.0
       Unique objects: 4.0 Current complexity: 5474705.084281757

  } # ----- End optimization group 1 -----
  # ESTIMATED NUMBER OF ITERATIONS: 5474705.084281757

 OPTIONAL
 {

  { # ----- Begin optimization group 2 -----

   ?n1 ns1:name ?officer_name . #   Collection size: 466139.0   Predicate collection size: 466139.0   Unique subjects:
466139.0 Unique objects: 335677.0   Current complexity: 1.0

  } # ----- End optimization group 2 -----

 # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 3 -----

      TRIPLE ?_anon_f5a7de20_b0c0_4e52_bb25_e2d74c65f921 { ?n1 ns1:officer_of ?n2 } . #   Collection size: 292749.0   Predicate collection size: 292749.0   Unique subjects: 238080.0   Unique objects: 120843.0   Current complexity: 1.0
      ?_anon_f5a7de20_b0c0_4e52_bb25_e2d74c65f921 ns1:link ?link1 . #   Collection size: 657530.0   Predicate collection size: 657530.0   Unique subjects: 657488.0   Unique objects: 33.0 Current complexity: 1.0000638794928576

    } # ----- End optimization group 3 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 4 -----

      ?n2 ns1:name ?officer2_name . #   Collection size: 466139.0   Predicate collection size: 466139.0   Unique subjects: 466139.0   Unique objects: 335677.0   Current complexity: 1.0

    } # ----- End optimization group 4 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 5 -----

      TRIPLE ?_anon_ec7a1374_6c85_482b_80dd_4adc9b292e9d { ?n2 ns1:officer_of ?n4 } . #   Collection size: 292749.0   Predicate collection size: 292749.0   Unique subjects: 238080.0   Unique objects: 120843.0   Current complexity: 1.0
      ?_anon_ec7a1374_6c85_482b_80dd_4adc9b292e9d ns1:link ?link2 . #   Collection size: 657530.0   Predicate collection size: 657530.0   Unique subjects: 657488.0   Unique objects: 33.0 Current complexity: 1.0000638794928576

    } # ----- End optimization group 5 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0000638794928576

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 6 -----

      ?n4 ns1:name ?entity_name . #   Collection size: 466139.0   Predicate collection size: 466139.0   Unique subjects: 466139.0   Unique objects: 335677.0   Current complexity: 1.0

    } # ----- End optimization group 6 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 7 -----

      ?n5 ns1:name ?intermediary_name . #   Collection size: 466139.0   Predicate collection size: 466139.0   Unique subjects: 466139.0   Unique objects: 335677.0   Current complexity: 1.0

    } # ----- End optimization group 7 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

```
  }
  OPTIONAL
  {

    { # ----- Begin optimization group 8 -----

      TRIPLE ?_anon_d11e2a65_943c_4c24_b717_8eba3b23ac0e { ?n5 ns1:intermediary\_of ?n4 } . #        Collection size: 213634.0
            Predicate collection size: 213634.0        Unique subjects: 14074.0        Unique objects: 213634.0        Current complexity:
1.0
      ?_anon_d11e2a65_943c_4c24_b717_8eba3b23ac0e ns1:valid\_until ?valid_until . #        Collection size: 1211778.0        Predicate
collection size: 1211778.0        Unique subjects: 1211778.0        Unique objects: 2.0   Current complexity: 1.0

    } # ----- End optimization group 8 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
  OPTIONAL
  {

    { # ----- Begin optimization group 9 -----

      ?n6 ns1:name ?e_name . #   Collection size: 466139.0        Predicate collection size: 466139.0        Unique subjects: 466139.0
            Unique objects: 335677.0        Current complexity: 1.0

    } # ----- End optimization group 9 -----
    # ESTIMATED NUMBER OF ITERATIONS: 1.0

  }
}
```