

PostgreSQL Queries

- Write a query to get data having length of Rna structures more than 12 with them being added after 2008.

Query:

```
SELECT * FROM rna
```

```
Where len > 12 AND timestamp > '2008-12-31 23:59:59.00'
```

```
ORDER BY timestamp
```

```
Limit 1000;
```

Output:

| | id bigint | upi [PK] character varying (30) | timestamp timestamp without time zone | userstamp character varying (60) | crs64 character | len integer | seq_short character varying (4000) |
|----|--------------|------------------------------------|--|-------------------------------------|--------------------|----------------|---|
| 1 | 975 | URS00000003CF | 2014-05-29 13:51:05 | RNACEN | 97F5ACDDA3BE62D9 | 1471 | GAGTTTGATCCTGGCTCAGATTGAACGCTGGCGGCAGGCCTA |
| 2 | 1900 | URS000000076C | 2014-05-29 13:51:05 | RNACEN | 3E75483FFBD37CEA | 482 | ACGGGGGCCCGCACAAAGCGGTGGAGCACGTTGGTTTAATTC |
| 3 | 3465 | URS00000000D89 | 2014-05-29 13:51:05 | RNACEN | 7CEA12DE0529F9AC | 316 | AAAGGCCGCGATACAGGGTGACAGCCCGGTACACGAAGGC |
| 4 | 970 | URS00000003CA | 2014-05-29 13:51:05 | RNACEN | 5CB0C9C6E7D299F0 | 68 | AAAGTAAGGTCAGCTAAATAAGCTATCGGGCCCATACCCGGA |
| 5 | 1459 | URS00000000583 | 2014-05-29 13:51:05 | RNACEN | 89325FA51B31E344 | 273 | ATCGTTGCCCGCGTGCCTTGGCCACGTGCTAGGCACCAAGCG |
| 6 | 1899 | URS0000000076B | 2014-05-29 13:51:05 | RNACEN | EB82AB69E57E275B | 748 | GATCCTGGGCTCAGAATCAACGCTGGCGGCGTGCTAACACAT |
| 7 | 258 | URS00000000102 | 2014-05-29 13:51:05 | RNACEN | 74555176E4C44530 | 673 | AAAGTCGTAACAAGGTACCGGTAGGTGAACCTGCCGGTGGAT |
| 8 | 498 | URS000000001F2 | 2014-05-29 13:51:05 | RNACEN | 73E0B12A9C43635 | 1090 | GGATCATTAAAGAGTTCTATAACCTCCCAACCCATGTGAACAT |
| 9 | 891 | URS0000000037B | 2014-05-29 13:51:05 | RNACEN | 6EB932C8052187DE | 350 | ATTGAACGTTGGCGGCAGGCCTAAACATGCAAGTCGAACGG |
| 10 | 969 | URS000000003C9 | 2014-05-29 13:51:05 | RNACEN | 3D510D83F6545042 | 391 | CCGAATCGGCTCTGTGCTCCCGGGAGTGATGAGCCAACCTA |
| 11 | 1206 | URS000000004B6 | 2014-05-29 13:51:05 | RNACEN | 6C31C045F7B99BF7 | 1150 | CGAAAGGCCTAATAACCGGATAAGCTCACGGACCCGCATG |
| 12 | 1458 | URS000000005B2 | 2014-05-29 13:51:05 | RNACEN | BA146498A2306283 | 68 | TGGTAGTTAGTTTAACTAAATAAATGATTTCGACTCATTAG |
| 13 | 1705 | URS000000006A9 | 2014-05-29 13:51:05 | RNACEN | B5091B78E753B090 | 545 | AAGGATCATTGGAACGGAGTTGATTCGAGCTCCGGCTCGACT |
| 14 | 1897 | URS00000000769 | 2014-05-29 13:51:05 | RNACEN | 67AC07AB28D28200 | 1321 | GCACGAACGCTTGTAGGACGCTTAACACATGCAAGTCGAAC |
| 15 | 117 | URS00000000075 | 2014-05-29 13:51:05 | RNACEN | CF5703FFFB63596 | 155 | TAAGGAATATTGGTCATGGACGCAAGTCTGAAACAGCCATG |
| 16 | 257 | URS00000000101 | 2014-05-29 13:51:05 | RNACEN | A7FC90D76847AF92 | 486 | GATGAACGCTAGCGGCAGGCTTAATACATGCAAGTCGAACGG |
| 17 | 364 | URS0000000016C | 2014-05-29 13:51:05 | RNACEN | E58217ABAFAF59011 | 263 | CAGCCCTAAACCGATGCGGCTTAGGTGTATCGGTGACCAAGA |
| 18 | 497 | URS000000001F1 | 2014-05-29 13:51:05 | RNACEN | CE89DBC6FD1A50E0 | 946 | TTTCCGGTTGATCCTGCGGACCCCACTGCTATCGGGATAGG |
| 19 | 616 | URS00000000268 | 2014-05-29 13:51:05 | RNACEN | DB63FAC99001B47C | 74 | GGCGCTATAGCCAAGTGTTAAGGCATAGGCTGCAACACCTT |
| 20 | 729 | URS000000002D9 | 2014-05-29 13:51:05 | RNACEN | 6AEE84E09761179A | 509 | AGGGTTTGCTGGCGTCTCGGTTAATAGCAGTAACGCGACGCC |
| 21 | 849 | URS00000000351 | 2014-05-29 13:51:05 | RNACEN | 500031529228EB8D | 386 | CTGCCATGTTGTGAGTTGCCCTGTGGAGAGGCCCATGTGAA |

| seq_long text | md5 character varying (64) |
|------------------|-----------------------------------|
| [null] | 1febcae280b6c5bbc0bbdbad2cbca823 |
| [null] | 03215b62685bc8ad5f4925bc909b0856 |
| [null] | 6bdf01cfde1a509de6cd4afa6389b9ce |
| [null] | 7bbb6a4f4a8b2a1077a541f3672e3223 |
| [null] | 1ff039e3bf23f9a15017d8e8dc1ccf76 |
| [null] | 6bd03c6afd88e866bfe0cb426c840742 |
| [null] | 7bb34dfaf604c2f7e1b782f85f82dfca |
| [null] | 6bbfc37889e9f5ad0d862b08239546e1 |
| [null] | 0315a2c104510f56a53a668e9b409036 |
| [null] | 6bc4100ea68e8be9c8cd11a02d255... |
| [null] | 6bc6b5bd6b3b62007466af17bf1073d03 |
| [null] | 7bbfcfe0ffad36b5cc6e070d44c8c |
| [null] | 1ff224fce0309cb5499f0e18840f1d26 |
| [null] | 7bc34b1f5a6decc21166a0a4497b3226 |
| [null] | 030da5c15de5b0161ac319adda5462... |
| [null] | 030f03de618dae51b4f67d5960e12c30 |
| [null] | 1fe652d7d164472c6792fe5cee36eba2 |
| [null] | 7bb5d26e87d22cf1a432b9e49d941438 |
| [null] | 03129469d78432a8941ffcf9bf3b7386 |
| [null] | 0313bf1685011280874e47e4714b98f9 |

And continue to till 1000 records.

2. How many pre computed RNA are present that are still active and got their last release update before 2022?

Query:

Select count(id) from rnc_rna_precomputed

Where is_active is TRUE AND update_date < '2022-01-01';

Output:

| | count bigint |
|---|-----------------|
| 1 | 55930772 |

3. How many total pre computed RNA records for snoRNA and tRNA were recorded in 2011, 2016, 2014, and 2020?

Query:

Select rna_type, count(id)

From rnc_rna_precomputed

Where ((update_date > '2010-12-31' AND update_date < '2012-01-01')

OR (update_date > '2013-12-31' AND update_date < '2015-01-01')

OR (update_date > '2015-12-31' AND update_date < '2017-01-01')

OR (update_date > '2019-12-31' AND update_date < '2021-01-01'))

AND (rna_type = 'snoRNA' OR rna_type = 'tRNA')

Group By rna_type;

Output:

| | rna_type character varying (500) | count bigint |
|---|-------------------------------------|-----------------|
| 1 | snoRNA | 70872 |
| 2 | tRNA | 844505 |

4. Can you give me the names of all databases built for RNA with minimum length other than 100, 200, 300, 400, and 15?

Query:

Select display_name, min_length from rnc_database

Where min_length NOT IN (15,100,200,300,400);

Output:

| | display_name character varying (60) 🔒 | min_length bigint 🔒 | | display_name character varying (60) 🔒 | min_length bigint 🔒 |
|----|--|------------------------|----|--|------------------------|
| 1 | ENA | 10 | 24 | RiboVision | 30 |
| 2 | GENCODE | 32 | 25 | Ensembl | 20 |
| 3 | MGnify | 27 | 26 | Ensembl Metazoa | 18 |
| 4 | GeneCards | 16 | 27 | PLncDB | 199 |
| 5 | RDP | 1337 | 28 | MGI | 21 |
| 6 | snoRNA Database | 45 | 29 | Ensembl/GENCODE | 32 |
| 7 | Rfam | 24 | 30 | PDBe | 10 |
| 8 | TAIR | 19 | 31 | PomBase | 47 |
| 9 | PSICQUIC | 21 | 32 | SGD | 58 |
| 10 | WormBase | 17 | 33 | HGNC | 33 |
| 11 | FlyBase | 18 | 34 | TarBase | 16 |
| 12 | snoDB | 25 | 35 | Ribocentre | 28 |
| 13 | SRPDB | 30 | 36 | NONCODE | 201 |
| 14 | ZFIN | 83 | 37 | REDIPortal | 0 |
| 15 | tmRNA Website | 59 | 38 | CRW | 107 |
| 16 | Expression Atlas | 72 | 39 | lncRNadb | 61 |
| 17 | Ensembl Fungi | 19 | 40 | EVLncRNAs | 199 |
| 18 | ZWD | 21 | 41 | snOPY | 42 |
| 19 | Ensembl Protists | 11 | 42 | MirGeneDB | 20 |
| 20 | GtRNadb | 53 | 43 | RGD | 49 |
| 21 | 5SrRNadb | 95 | 44 | Greengenes | 1253 |
| 22 | Modomics | 54 | 45 | dictyBase | 32 |
| 23 | MalaCards | 16 | 46 | LncBook | 54 |

| | | |
|----|---------|----|
| 47 | LncBase | 17 |
| 48 | IntAct | 18 |

5. Can you get complete 500 records of sequences for active regions and name your column as myregions in which you are getting the region name column value? Then tell me what different chromosomes with exon_count we have for regions including center, east and north using the name you set for your column.

Query:

So basically, this query has two parts.

- Select r.region_name as myregions From rnc_sequence_regions r
left join rnc_rna_precomputed p on r.urs_taxid=p.id
Where p.is_active is TRUE
Order By r.id
Limit 500;

Output:

| | myregions text | |
|----|--|--|
| 1 | URS00000003C7_4896@I/2362324-2362771:+ | |
| 2 | URS000000086E_80884@CACQ02003602/5181-5237:+ | |
| 3 | URS000000086E_80884@CACQ02008496/758-814:+ | |
| 4 | URS000000086E_80884@CACQ02008999/276-332:- | |
| 5 | URS0000001578_403677@supercont1.68/74803-74863:+ | |
| 6 | URS0000001C12_332648@10/2349948-2350037:+ | |
| 7 | URS0000001C12_332648@5/2159942-2160020:- | |
| 8 | URS0000001C12_332648@8/1272226-1272302:- | |
| 9 | URS000000224D_5855@10/12361-13959:- | |
| 10 | URS000000224D_5855@2/146582-148180:- | |
| 11 | URS000000224D_5855@3/806003-807601:+ | |
| 12 | URS000000246A_80884@CACQ02003602/5251-6018:+ | |
| 13 | URS000000246A_80884@CACQ02008496/828-1389:+ | |
| 14 | URS000000246A_80884@CACQ02009340/233-794:+ | |
| 15 | URS0000002F4A_5823@12/1587712-1587794:- | |
| 16 | URS0000003142_284591@B/1186533-1186628:- | |
| 17 | URS0000003D30_4896@I/3754985-3755801:- | |
| 18 | URS0000003D30_4896@I/3786530-3787370:+ | |
| 19 | URS0000003D30_4896@II/1611692-1612508:- | |
| 20 | URS0000003D30_4896@II/1635374-1636190:+ | |
| 21 | URS0000003D30_4896@III/1089166-1089994:- | |
| 22 | URS0000003D30_4896@III/1108951-1109779:+ | |
| 23 | URS0000003DC0_4896@I/149658-149776:+ | |

Continue to till 500 records.

- b. Select chromosome, count(exon_count) as ExonCount From rnc_sequence_regions
 Where Exists (Select r.region_name as myregions From rnc_sequence_regions r
 left join rnc_rna_precomputed p on r.urs_taxid=p.id
 Where p.is_active is TRUE
 Order By r.id
 Limit 500)
 Group By Chromosome;

Output:

| | chromosome text | exoncount bigint |
|----------------------------|--------------------|-----------------------------|
| 1 | AGKD04104609.1 | 1 |
| 2 | VUNX01061108.1 | 2 |
| 3 | KE928300.1 | 1 |
| 4 | AGKD04301638.1 | 51 |
| 5 | NOIK01000067.1 | 1 |
| 6 | BHFT01003808.1 | 3 |
| 7 | JAHLQT010018911.1 | 6 |
| 8 | CAAAFN010000081.1 | 1 |
| 9 | GL345627.1 | 4 |
| 10 | LFEI02000293.1 | 1 |
| 11 | AGKD04425150.1 | 4 |
| 12 | ABRO02099192.1 | 2 |
| 13 | PEKY01003615.1 | 3 |
| 14 | PTFD01000861.1 | 1 |
| 15 | AGKD04247669.1 | 34 |
| 16 | scaffold_15645 | 7 |
| 17 | KI636991.1 | 1 |
| 18 | CAJNNU010000162.1 | 10 |
| 19 | Scfld02_1185 | 1 |
| 20 | scaffold_114618 | 4 |
| 21 | NW_026047066.1 | 23 |
| 22 | JH583770.1 | 14 |
| 23 | NJHO01006013.1 | 9 |
| 24 | scaffold_10018 | 1 |
| Total rows: 1000 of 575770 | | Query complete 00:07:57.586 |