Warm-up exercise:

The default “shared_buffers” value given in the postgresql.conf file is 128MB. Given that each buffer is 8KB long. The quantity of shared buffers is 128 * 1024 * 1024/8 * 1024 = 16,384

Ex1: Devise some Queries on the Test DB

what is the largest staff/student id? (People.id)

```
uni=# select max(id) from people;
 max
------
 5936
(1 row)
```

what is the earliest birthday of any person in the database? (People.birthday)

```
uni=# select min(birthday) from people;
    min
------------
 1970-01-17
(1 row)
```

what is the maximum mark available for any assessment item? (Items.maxmark)

```
uni=# select max(maxmark) from items;
 max
-----
  90
(1 row)
```

what assessment items are in each course and how many marks does each have? (Courses.code,Items.name,Items.maxmarks))

```
uni=# select courses.code, items.name, items.maxmark
from courses, items
where courses.id = items.course;
   code   |     name     | maxmark
----------+--------------+---------
 ACCT1501 | Assignment 1 |      10
 ACCT1501 | Assignment 2 |      10
 ACCT1501 | Project      |      25
 ACCT1501 | Exam         |      55
 ACCT1511 | Assignment 1 |      15
 ACCT1511 | Assignment 2 |       5
 ACCT1511 | Assignment 3 |      15
 ACCT1511 | Exam         |      65
 ACCT2522 | Assignment 1 |      10
 ACCT2522 | Assignment 2 |      10
```

how many students are enrolled in each course? (Courses.code,count(Enrolments.student))

```
uni=# select courses.code, count(enrolments.student)
uni-# from courses, enrolments
uni-# where courses.id = enrolments.course
uni-# group by courses.code
uni-# order by courses.code;
   code    | count
----------+-------
 ACCT1501 |     7
 ACCT1511 |     2
 ACCT2522 |     2
 ACCT3563 |     3
 ACCT3583 |     4
```

check that each student's assessment marks add up to the final mark for each course (Course.code,People.name,Enrolments.mark,sum(Assessment.marks))

```
uni=# select c.code, p.family||', '||p.given as name, e.mark, sum(a.mark)
uni-# from   People p, Courses c, Enrolments e, Items i, Assessments a
uni-# where  p.id = e.student and e.course = c.id and i.course = c.id
uni-#        and a.student = p.id and a.item = i.id
uni-# group  by c.code, p.family, p.given, e.mark
uni-# order  by c.code, p.family;
   code    |                   name                    | mark | sum
----------+-------------------------------------------+------+-----
 ACCT1501 | Agster, Yvan Marie                        |   68 |  68
 ACCT1501 | Bland, Daryl Robert                       |   56 |  56
 ACCT1501 | Fadaghi, Mundeep Singh                    |   47 |  47
 ACCT1501 | Gafen, Andrei                             |   56 |  56
 ACCT1501 | Mcnulty, Abu Rifat                        |   77 |  77
 ACCT1501 | Nugent, Daina                             |   55 |  55
etc. etc., for 3506 tuples
```

Ex2: Explore the Files of the Test DB

1.

```
z5242692=# select oid, datname from pg_database;
  oid  |  datname
-------+-----------
 12425 | postgres
     1 | template1
 12424 | template0
 16386 | test
 16387 | z5242692
 16550 | beer
 16641 | uni
(7 rows)
```

This will give you a list of databases, including template1, template0 and postgres, each with an associated OID. There should also be a tuple for your **uni** database; the OID value should also appear as the name of a directory in **pgsql/data/base/**.

2.

```
uni=# select c.oid, c.relname
from pg_class c, pg_namespace n
where c.relkind = 'r' and c.relnamespace = n.oid
and n.nspname = 'public';
  oid  |   relname
-------+-------------
 16660 | items
 16646 | assessments
 16664 | people
 16650 | courses
 16655 | enrolments
(5 rows)
```

Show data files associated with a table are named after the OID of that table.

3. While you're examining the data files, return to psql and write a query to print the number of data pages in each relation.

```
uni=# select c.relname, c.relpages
from pg_class c, pg_namespace n
where c.relkind = 'r' and c.relnamespace = n.oid
and n.nspname = 'public';
   relname   | relpages
-------------+----------
 items       |       26
 assessments |       70
 people      |       27
 courses     |        9
 enrolments  |       19
(5 rows)
```

4. Once you've got the page counts in the catalog, check that they're consistent with the file sizes in the directory for the uni database (assuming an 8KB page size).

```
uni=# select oid, relpages from pg_class where relname = 'courses';
  oid  | relpages
-------+----------
 16650 |        9
(1 row)

uni=# \q
grieg % ls -l 16650
-rw------- 1 z5242692 z5242692 73728 Jun 18 11:45 16650
grieg % bc -l
bc 1.06.95
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For details type `warranty'.
9 * 8192
73728
```