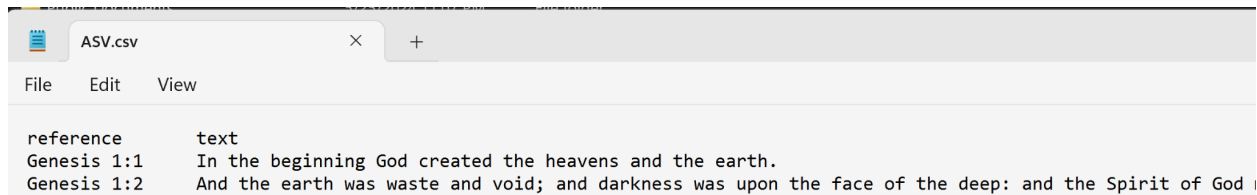


Goal: Create a database of different versions of the bible. Be able to implement the functionality of a concordance, including searching for verses containing a phrase, and compare verses between versions. Be able to answer complex questions about the text.

Steps: 1. Download text files of various versions from openbible.com.
2. Convert each to CSV and upload to Postgres database – one table for each version.

Skills Required: Creation of tables and procedures; executing queries.

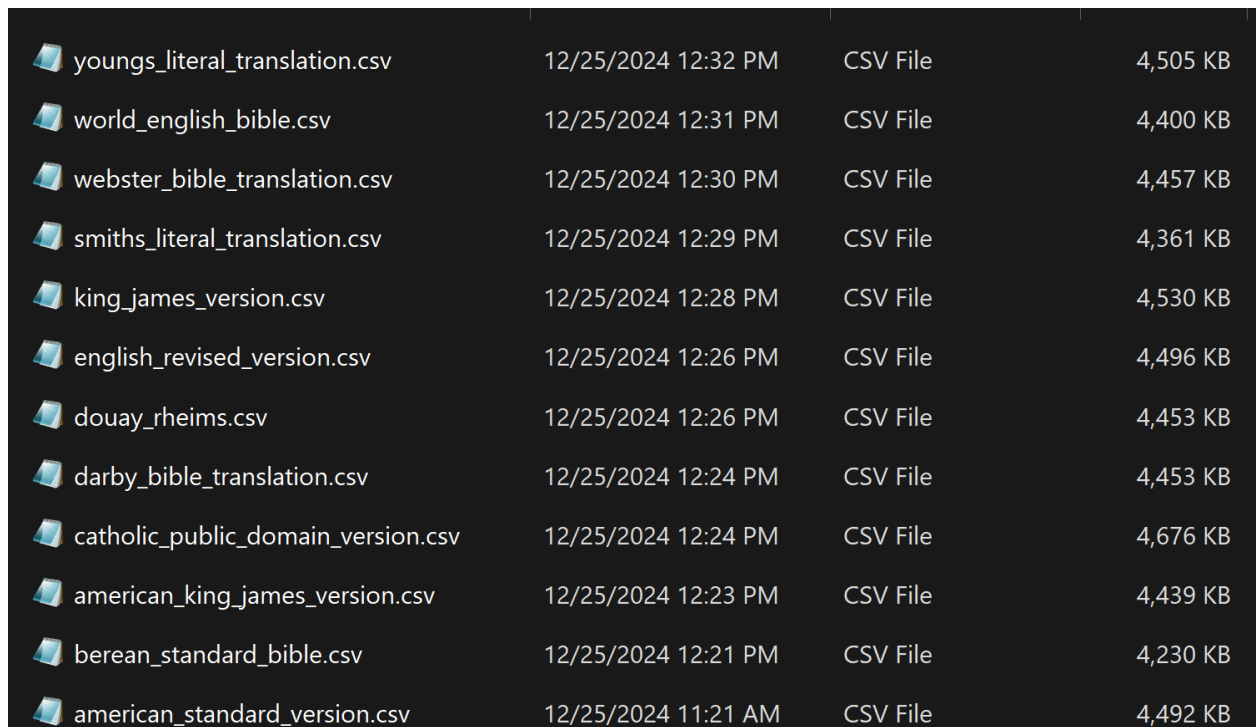
We copy each version from the website into a csv file. The example below is for ASV (American standard version), and the same structure is followed for each file.



The screenshot shows a text editor window titled 'ASV.csv'. It contains two columns: 'reference' and 'text'. The first row shows 'Genesis 1:1' with the text 'In the beginning God created the heavens and the earth.' The second row shows 'Genesis 1:2' with the text 'And the earth was waste and void; and darkness was upon the face of the deep: and the Spirit of God'.

reference	text
Genesis 1:1	In the beginning God created the heavens and the earth.
Genesis 1:2	And the earth was waste and void; and darkness was upon the face of the deep: and the Spirit of God

Then, create tables in Postgres with corresponding names. We want to create tables with identical field names and types for all the versions listed below.



The screenshot shows a file explorer window with a list of 12 CSV files. Each file has a blue folder icon, a name, a date and time, a file type, and a size.

File Name	Date and Time	File Type	Size
youngs_literal_translation.csv	12/25/2024 12:32 PM	CSV File	4,505 KB
world_english_bible.csv	12/25/2024 12:31 PM	CSV File	4,400 KB
webster_bible_translation.csv	12/25/2024 12:30 PM	CSV File	4,457 KB
smiths_literal_translation.csv	12/25/2024 12:29 PM	CSV File	4,361 KB
king_james_version.csv	12/25/2024 12:28 PM	CSV File	4,530 KB
english_revised_version.csv	12/25/2024 12:26 PM	CSV File	4,496 KB
douay_rheims.csv	12/25/2024 12:26 PM	CSV File	4,453 KB
darby_bible_translation.csv	12/25/2024 12:24 PM	CSV File	4,453 KB
catholic_public_domain_version.csv	12/25/2024 12:24 PM	CSV File	4,676 KB
american_king_james_version.csv	12/25/2024 12:23 PM	CSV File	4,439 KB
berean_standard_bible.csv	12/25/2024 12:21 PM	CSV File	4,230 KB
american_standard_version.csv	12/25/2024 11:21 AM	CSV File	4,492 KB

Each table should have the same structure: fields with id, reference, book_name, chapter_number, verse_number, text. To automate the data copying and table creation, we can write a stored procedure.

Notice that the format function is required to interpolate the input parameter into the desired statements.

```
1 create or replace procedure versions_upload (version_name text)
2 language plpgsql
3 as $$
4 declare fpath text := 'C:\users\Public\'||version_name||'.csv';
5 begin
6 -- table creation
7 execute format('
8 create table %s (
9     id serial primary key,
10     reference text,
11     book_name text,
12     chapter_number integer,
13     verse_number integer,
14     text text
15 )',version_name);
16 -- data import
17 execute format('
18 copy %s (reference, text)
19 from '%s'
20 delimiter ' '
21 csv header',version_name,fpath);
22
23 end;$$;
```

To call the procedure on each file, we perform the following transaction.

Query	Query History
1	<code>call versions_upload('youngs_literal_translation');</code>
2	<code>call versions_upload('world_english_bible');</code>
3	<code>call versions_upload('webster_bible_translation');</code>
4	<code>call versions_upload('smiths_literal_translation');</code>
5	<code>call versions_upload('king_james_version');</code>
6	<code>call versions_upload('english_revised_version');</code>
7	<code>call versions_upload('douay_rheims');</code>
8	<code>call versions_upload('darby_bible_translation');</code>
9	<code>call versions_upload('catholic_public_domain_version');</code>
10	<code>call versions_upload('american_king_james_version');</code>
11	<code>call versions_upload('berean_standard_bible');</code>
12	<code>call versions_upload('american_standard_version');</code>

Data Output	Messages	Notifications
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CALL

Query returned successfully in 2 secs 977 msec.

And here is the database directory.

Tables (12)
> american_king_james_version
> american_standard_version
> berean_standard_bible
> catholic_public_domain_version
> darby_bible_translation
> douay_rheims
> english_revised_version
> king_james_version
> smiths_literal_translation
> webster_bible_translation
> world_english_bible
> youngs_literal_translation

Below are the first few records from the berean version.

Query	Query History	Scratch Pad
1 select * from berean_standard_bible		
2 limit 10;		
Data Output	Messages	Notifications
id [PK] integer	reference text	book_name text
1	Genesis 1:1	[null]
2	Genesis 1:2	[null]
3	Genesis 1:3	[null]
chapter_number integer	verse_number integer	text text
[null]	[null]	In the beginning God created the heavens and the earth.
[null]	[null]	Now the earth was formless and void, and darkness was over the surface
[null]	[null]	And God said, "Let there be light," and there was light.

The next step is to fill in the book, chapter number, and verse number for each table. Since the verse text is there for each table, we can write a new procedure to fill in these values.

*Technically, these tables will not be completely normalized because the book,chapter and verse fields will of course depend on the single reference field. So, after the process is complete, we will drop the reference column from each table.

In order to extract the book name, we will extract the substring from the beginning until the first space character. This will be problematic for the books that start with a number (e.g. 1 John, 2 Corinthians, 3 John, etc). So, we will first replace the first space with an underscore for all such books. For the book 'Song of Solomon', we apply a second statement to change it to 'Song_of_Solomon'. Then, we do the book extraction. Chapters will be done by finding the number between the space and the ':'. Verse number will be everything after the ':'.

This procedure is called versions_update, and here is the body.

```
{ } versions_update(IN version_name text)
```

General Definition **Code** Options Parameters Security SQL

```
1
2 ▼ begin
3   -- replace first space with underscore
4   -- for ranked books
5   execute format('
6   update %s
7   set reference = regexp_replace(reference, ' ' , '_' ,1)
8   where substring(reference,1,1) in ('1','2','3','4')',
9   version_name
10  );
11
12  execute format('
13  update %s
14  set reference = replace(reference, 'Song of Solomon', 'Song_of_Solomon')
15  where reference like 'Song of Solomon%%',
16  version_name
17  );
18
19 end;
```

We run the above procedure for each table. Finally, we create and run the next procedure for extracting the reference components.

```
{ } versions_parse_reference(IN version_name text)
```

General Definition **Code** Options Parameters Security SQL

```
1
2 ▼ begin
3   -- replace first space with underscore
4   -- for ranked books
5   execute format('
6   update %s
7   set book_name = substring(reference from 1 for position(' ' ' in reference)),
8   chapter_number = substring(reference from position(' ' ' in reference)+1 for position(': ' ' in reference)-position(' ' ' in reference)-1)::integer,
9   verse_number = substring(reference from position(': ' ' in reference)+1)::integer',
10  version_name
11  );
12
13 end;
```

Here are a few records from the berean version, after processing.

Query

Query History

1

select *

2

from berean_standard_bible;

Data Output

Messages

Notifications

	id [PK] integer	reference text	book_name text	chapter_number integer	verse_number integer	text text
1	476	Genesis 19:18	Genesis	19	18	But Lot replied, "No, my lords, please!
2	4542	Numbers 26:52	Numbers	26	52	Then the LORD said to Moses,
3	30623	1_John 4:19	1_John	4	19	We love because He first loved us.
4	1396	Genesis 46:9	Genesis	46	9	The sons of Reuben: Hanoch, Pallu, Hezron, a

We are now in shape to do serious analysis on the bible in english.

Below are a list of tasks and questions, with queries shown to answer each.

1. How many books are in the bible? What are the top ten longest books?
2. Generate a report showing each book of the bible and the number of chapters of each.
3. What is the longest verse in the king james version?
4. Show all verses that include both the words 'wisdom' and 'knowledge' in the same verse.
5. Show 1 John 3:16 in king james and english revised and darby versions.

1 & 2. Scrolling to the bottom of the table below shows us there are 66 books. The ranked books (e.g. 1_Peter) are shown first, with the remaining books listed alphabetically.

Query

Query History

1

select book_name,count(distinct chapter_number) as num_chapters

2

from king_james_version

3

group by 1

4

order by 1 asc;

Data Output

Messages

Notifications

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	book_name text	num_chapters bigint
1	1_Chronicles	29
2	1_Corinthians	16
3	1_John	5
4	1_Kings	22
5	1_Peter	5
6	1_Samuel	31
7	1_Thessalonians	5

In terms of # of verses, the ten longest are shown below.

Query








Query History

```
1 select book_name,count(*) as num_verses
2 from king_james_version
3 group by 1
4 order by 2 desc
5 limit 10;
```

Data Output

Messages

Notifications



	book_name text	num_verses bigint
1	Psalms	2461
2	Genesis	1533
3	Jeremiah	1364
4	Isaiah	1292
5	Numbers	1288
6	Ezekiel	1273
7	Exodus	1213
8	Luke	1151
9	Matthew	1071
10	Job	1070

3. The longest verse in the king james version is:

Query Query History

```

1 select reference, length(text) as verse_length
2 from king_james_version
3 order by verse_length desc
4 limit 1;

```

Data Output Messages Notifications

	reference text	verse_length integer
1	Esther 8:9	534

4.

Query Query History

```

1 select reference, text
2 from king_james_version
3 where text like '%wisdom%'
4 and text like '%knowledge%'
5 order by id;

```

Data Output Messages Notifications

	reference text	text text
1	Exodus 31:3	And I have filled him with the spirit of God, in wisdom, and in understanding, and in knowledge, and in all manner of workmanship;
2	Exodus 35:31	And he hath filled him with the spirit of God, in wisdom, in understanding, and in knowledge, and in all manner of workmanship;
3	2_Chronicles 1:10	Give me now wisdom and knowledge, that I may go out and come in before this people: for who can judge this thy people, [that is]
4	2_Chronicles 1:11	And God said to Solomon, Because this was in thine heart, and thou hast not asked riches, wealth, or honour, nor the life of thine
5	Job 34:35	Job hath spoken without knowledge, and his words [were] without wisdom.
6	Proverbs 1:7	The fear of the LORD [is] the beginning of knowledge: [but] fools despise wisdom and instruction.
7	Proverbs 2:6	For the LORD giveth wisdom: out of his mouth [cometh] knowledge and understanding.

5.

Query Query History

```

1 select reference, text
2 from king_james_version
3 where reference = '1_John 3:16'
4 union all
5 select reference, text
6 from english_revised_version
7 where reference = '1_John 3:16'
8 union all
9 select reference, text
10 from darby_bible_translation
11 where reference = '1_John 3:16';

```

Data Output Messages Notifications

	reference text	text text
1	1_John 3:16	Hereby perceive we the love [of God], because he laid down his life for us: and we ought to lay down [our] lives for the brethren.
2	1_John 3:16	Hereby know we love, because he laid down his life for us: and we ought to lay down our lives for the brethren.
3	1_John 3:16	Hereby we have known love, because he has laid down his life for us; and we ought for the brethren to lay down [our] lives.