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WordEngineering

Ken Adeniji

A thesis submitted for the degree of Doctor of Philosophy in the Faculty of Science.

Abstract

Thesis Statement: This dissertation introduces [AlphabetSequence](#) (2Corinthians 10:9-18). The AlphabetSequenceIndex is the result of a pure function to sum alphabet places [AlphabetSequence](#). The AlphabetSequenceIndexScriptureReference are the offsets from the beginning and the ending of the Scripture. The AlphabetSequenceIndexScriptureReference consists of four parts; there are two references each to particular chapters and verses. The first mention is the forward verse, which the author calculates by determining the AlphabetSequenceIndex verse in the Bible. The second mention is the forward chapter, and this the author calculates as before, but by substituting the verse with the chapter. Both the backward chapter and backward verse are the corresponding, anticlockwise places.

The importance of this work?

- [Follow God, as a character.](#)
- [If you are a follower of Me or if you are a follower of the book? How we cannot... disassociate.](#)
- [To track dates and words? And find meaning correlation.](#)
- [To touch... numeric.](#) Miracles of turning water into wine, feeding with fish and bread, resurrection after 3 days.
- [How do you associate goodness with kindness. \(Exodus 6:2-7\)?](#)

Where does the Bible list? Creation days, genealogies, allies, plagues, tribes, journey, commandments, reigns, kingdoms, disciples, fruit of the Holy Spirit, churches.

Acknowledgments

Chuck Minder of [Koinonia House \(KHouse\)](#) is worthy of note, [faith \(Hebrews 11\)](#).

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Theory

The Bible Database

The Scripture Table

The content of the Bible SQL Server database is principally the Scripture table. The Scripture table has a [composite primary key](#), which consists of three columns; the BookID, ChapterID, and VerseID columns. The SQL statement ALTER TABLE Bible..Scripture ADD CONSTRAINT [PK_Scripture] PRIMARY KEY CLUSTERED (BookID ASC, ChapterID ASC, VerseID ASC) is for setting the primary key.

The author proposes creating a non-unique index, IDX_Scripture_ChapterIDSequence, on the ChapterIDSequence column. The author is undecided, if this index will be clustered or non-clustered.

There are varchar(MAX) columns which has the text for each Bible version.

The Scripture Table's BookID Column

Because there are sixty-six books in the Bible, the BookID ranges between 1 and 66; starting from Genesis and ending at Revelation. The SQL statement ALTER TABLE Bible..Scripture ADD CONSTRAINT CK_Scripture_BookID_Range CHECK (BookID BETWEEN 1 AND 66) will set the range restriction.

The Scripture Table's ChapterID Column

The ChapterID ranges between 1 and 150; the SQL statement SELECT MAX(ChapterID) FROM Bible..Scripture is for determining the upper limit. The SQL statement ALTER TABLE Bible..Scripture WITH CHECK ADD CONSTRAINT [CK_Scripture_ChapterID_Range] CHECK ((([ChapterID]>=(1) AND [ChapterID]<=(150)))) will set the range restriction.

The Scripture Table's VerseID Column

The VerseID ranges between 1 and 176; the SQL statement SELECT MAX(VerseID) FROM Bible..Scripture is for determining the upper limit. The SQL statement ALTER TABLE Bible..Scripture WITH CHECK ADD CONSTRAINT [CK_Scripture_VerseID_Range] CHECK ((([VerseID]>=(1) AND [VerseID]<=(176)))) will set the range restriction.

The Scripture Table's KingJamesVersion Column

The author would have considered placing an index on the KingJamesVersion column, but the author found out during his research, that the KingJamesVersion is not unique, and indexes are not applicable to like query expressions with leading wildcards.

The Scripture View's Testament Column

The SQL statement (case when BookID <=(39) then 'Old' else 'New' end) will set this computed column. The Testament column serves as a filter, such as, in the [BibleWord](#).

The Scripture View's BookTitle Column

The SQL statement dbo.udf_BookTitle(BookID) is for determining this computed column. As expected, there is a correlation between the BookID column, and its corresponding BookTitle column, it progresses from Genesis to Revelation. Because SQL does not support arrays, the author, chose to write a [SQL CLR C#](#) function for determining the BookTitle, when passed the BookID. Although, C# supports [Design by contract](#), assertions, but the author only checks BookID range validity, and return NULL, if the argument does not fall within this range. The author could throw exceptions, but the author does not know the side effect nor full ramifications. Instead of writing and determining the BookTitle using C#, an alternative is to use a database table. A table with two columns, BookID and BookTitle, will store and make extractable the sixty-six books.

The Scripture Table's ScriptureReference Column

The SQL statement dbo.udf_ScriptureReference(BookID, ChapterID, VerseID) will calculate the conjecture of the BookTitle, ChapterID, and VerseID. Since this is a computed column; therefore, you can not set its [Entity Integrity](#); if it were not, the SQL statement ALTER TABLE Bible..Scripture ADD CONSTRAINT uc_Scripture_ScriptureReference UNIQUE (ScriptureReference) will set its entity integrity. The distinction between raw data versus computed columns is performance, space. For example the beginning book of the New Testament, the 40th book, spelling is Matthew or Mathew, double it versus single t. An improvement on the current implementation is to use [soundex](#) to decipher the book title and the corresponding BookID.

The Scripture Table's ChapterIDSequence Column

When loading data, the author decides the ChapterIDSequence column; and increment it, every time, the BookID and ChapterID, changes during load. The ChapterIDSequence ranges between 1 and 1189; starting from Genesis 1 and ending at Revelation 22. The SQL statement SELECT BookID, ChapterID FROM Bible..Scripture GROUP BY BookID, ChapterID ORDER BY BookID, ChapterID will decide the greatest value for ChapterIDSequence. An alternative SQL statement select count(distinct cast(BookID as varchar(6)) + ' ' + cast(ChapterID as varchar(6))) FROM Bible..Scripture Another SQL statement; with cte (BookID , ChapterID) as (select distinct BookID, ChapterID FROM Bible..Scripture) select cnt = count(*) from cte The SQL statement ALTER TABLE Bible..Scripture ADD CONSTRAINT CK_Scripture_ChapterIDSequence_Range CHECK (ChapterIDSequence BETWEEN 1 AND 1189) will do the range correctness. Although it is good to know the ChapterIDSequence, but it is primarily used to decide the boundaries for scripture reference queries.

The Scripture Table's VerseIDSequence Column

When loading data, the author calculates the VerseIDSequence column, and increments it, every time, the BookID, ChapterID, and VerseID changes during the data load. There are some Bible books that have only one chapter, such as, Obadiah, Philemon, 2 John, 3 John, Jude; therefore, the author is careful when the choice is made to increment and update the VerseIDSequence column. The SQL statement SELECT BookTitle FROM Bible..Scripture GROUP BY BookID, BookTitle HAVING MAX(ChapterID) = 1 ORDER BY BookID is for listing these one chapter, Bible books. The VerseIDSequence ranges between 1 and 31102; starting from Genesis 1:1, and ending at Revelation 22:21. The SQL statement SELECT COUNT(*) FROM Bible..Scripture will decide the greatest value for VerseIDSequence, the total number of rows, records, in the Bible..Scripture table. The SQL statement ALTER TABLE Bible..Scripture ADD CONSTRAINT CK_Scripture_VerseIDSequence_Range CHECK (VerseIDSequence BETWEEN 1 AND 31182) will do the data integrity. As said earlier, although it is good to know the VerseIDSequence, but it is primarily used to decide the boundaries for scripture reference queries. The identity functionality which auto-increments, before inserting each row is useful, for ensuring this candidate primary key, abides by the entity integrity constraint; however, The SQL statement ALTER TABLE Bible..Scripture ADD CONSTRAINT AK_Scripture_VerseIDSequence UNIQUE (VerseIDSequence) is supplementary.

The Scripture_View BibleReference Column

The SQL statement ((right('00'+CONVERT([varchar](2),[BookID],[0]),(2))+right('000'+CONVERT([varchar](3),[ChapterID],[0]),(3))+right('000'+CONVERT([varchar](3),[VerseID],[0]),(3))) will combine the BookID, ChapterID, and VerseID. This is a convention for referring to Bible rows, by a unique identifier, which consists of the BookID, ChapterID, and VerseID. The leading zeros are placeholders for blocks of IDs, such as, BookID which will have two digits, ChapterID which will have three digits, and VerseID which will also have three digits. It is easier, faster, and more compact to restrict and order by numbers rather than text. Listed below, is the result set, for this SQL statement. SELECT ScriptureReference, BibleReference FROM Bible..Scripture_View WHERE BookID = 43 AND ChapterID = 1 AND VerseID = 1

ScriptureReference	BibleReference
John 1:1	43001001

There is a conversion page [BibleReference.html](#). Please note, that the author has not developed this further, it is just an introduction and speculation, which others may wish to adopt.

Most of the applications, extract information, and query the Scripture table. If the user chooses to, he may choose to load another Bible version, into the Scripture table and the application will still work as usual, and there will be no need to make changes to the application; thereby, achieving [Separation of concerns\(SoC\)](#).

The Exact Table

The Exact table's, primary task, is to tell, on the words that are in the Bible. Its information set include each word's first and last scripture reference occurrence(s), and count of occurrence(s). If the word, occurs only once, then the last occurrence is set to null. The incentive for writing the exact module comes from [Dave Hung](#), who will talk of each word's specifics, and [Chuck Misler](#) who noted that the first occurrence of the word, [logos](#) is in [Genesis 22:2](#). The exact table, is a holding area, for staging information; it could be argued that there is no need, to have this table, because it sources its information from the Scripture table, and it is available using [Language Integrated Query](#). The reasoning of the author is that the Scripture table is static data, and it does not need processing, each time, there is a request. Speed and lower work load are the advantages of the approach of the author; its disadvantage is that the exact table needs re-population, when there is a shift to another Bible version, which the author does not project, at this time. If there is a need, to support another Bible version, then the Exact table loading procedure needs expansion to aid, this flexibility. The [Exact](#) result for the author's initials, KAA, in Karkaa, meaning [floor \(Joshua 15:3\)](#). [Word Occurrences](#) is dynamic, and it supports the other versions of the Bible.

The Exact Table's ExactID Column

The ExactID is an [identity column](#), meaning the database, SQL Server, auto-increments its value, before insertion. There are 12891 unique words, in the Bible.Exact table. The SQL statement SELECT MAX(ExactID) FROM Bible..Exact is for determining the highest value. The SQL statement SELECT COUNT(BibleWord) FROM Bible..Exact is for determining the word count. The SQL statement ALTER TABLE Bible..Exact ADD CONSTRAINT CK_Exact_ExactID_Range CHECK (ExactID BETWEEN 1 AND 12891) is for the range restriction. For storage reason, the author has chosen, not to have a unique index, on this candidate primary key; in-spite, of it being a query item. Future implementation, may issue the SQL statement CREATE UNIQUE INDEX AK_Exact_ExactID ON Bible..Exact(ExactID) SELECT SUM(FrequencyOfOccurrence) FROM Bible..Exact is 789631; this is the sum of the words in the KJV Bible.

The Exact Table's BibleWord Column

These are the words that occur in the Bible, in the order of their occurrences. The author sets the [primary key](#), the constraint, by issuing the SQL statement ALTER TABLE [dbo].[Exact] ADD CONSTRAINT [PK_Exact] PRIMARY KEY CLUSTERED ([BibleWord] ASC).

The Exact Table's FirstOccurrenceScriptureReference Column

This is the scripture reference where the word first occurs in the Bible. The author may set-up the relationship by issuing the SQL statement ALTER TABLE [dbo].[Exact] WITH CHECK ADD CONSTRAINT [FK_Exact_Scripture] FOREIGN KEY(FirstOccurrenceScriptureReference) REFERENCES dbo.Scripture (ScriptureReference). Please note, that as discussed earlier, the author cannot have, a unique constraint, on the Bible..Scripture.ScriptureReference column, since this is a computed column; the author can not keep up the relationship, at this time.

The Exact Table's LastOccurrenceScriptureReference Column

This is the reference to the scripture where the word last occurs in the Bible; if there is only one occurrence, the value of this entry is null. As with the FirstOccurrence column, the referential integrity rule applies.

The Exact Table's Difference Column

This is to measure the word's longevity; the difference in VerseIDSequence between when it first and last appeared.

The Exact Table's Occurrence Column

This is the pervasiveness of the word, how often is the word used in the Bible?

The WordEngineering Database

The WordEngineering SQL Server database, mainly consists, of four tables - [HisWord](#), [Remember](#), [APass](#), [ActToGod](#).

The HisWord Table

- Title
- Abstract
- Acknowledgments
- Theory
- Results and Discussion
- Terminology
- References
- Appendices
- Background
- Prophecy and Fulfillment
- Autobiography
- Style of Writing

The HisWord table is what the author heard from the source. The entries in the HisWord table are exact and representable in alphanumeric format ([Numbers 12:6-8](#)). In following, the Bible's New Testament convention, where there are translations of Hebrew words to English which is being interpreted ([Matthew 1:23](#), [Mark 5:41](#), [Mark 15:22](#), [Mark 15:34](#), [John 1:38](#), [John 1:41](#), [Acts 4:26](#)); so also, there are translations of Yoruba words to English.

There have been cases when the author cannot spell and fully comprehend what he heard. In such cases, and not dispose of the records, the author will partly enter what he heard. This impedence mismatch between what the speaker said and what the listener heard, rarely occurs with English words. But it is likely, in the author's native language, Yoruba, which exploits word combinations and phrases. The alphabets differ slightly between the English and Yoruba languages; Yoruba contains diacritic alphabets. The author requires a Yoruba dictionary and translator, a recent success is with the <https://translate.google.com> web page.

The HisWord table's most important column, as the name suggests, is the word column, which is either English or Yoruba; or a mixture of both languages. The author will yield to the Holy Spirit in translating Yoruba words to English. From previous experience, this translation is not always the most right or relevant, and different words may contain the diacritic alphabets; therefore, introduce various meanings ([1 Corinthians 12:30](#), [1 Corinthians 14](#)). To account for the discrepancy in translation, the author sought help from the LORD.

2015-11-01T22:55:00 And, the merge, is the money, convert. 2015-11-03T02:17:00 The specifics, a language.

The word column is a potential natural primary key, since duplicates are rare. When redundancies do occur, we may append the sequence to the word, to generate a unique word. We do this manually, but an [insert trigger](#), will offer automation, and will cut the risk of primary key violation, which leads to gaps in the identity column.

The HisWord's table, commentary column, contains implicit information. This communication is most likely non-verbal, and it is information such as creatures standing or moving towards particular locations or engaging in other visible activities.

As such, from the creation account, on the first day, there is a commandment, and there may be an action/response. The commandment is in the word column God created light ([Genesis 1:3-5](#)). The action is in the commentary column; God separated the light from the darkness ([Genesis 1:1-2, 4](#)).

SQL Server generates sequential numbers for the HisWordID [identity column](#). The goodness of this technique is that it is a candidate primary key, data loss is trackable, and it provides a sort key. The HisWordID column may serve as the [primary](#) and/or [foreign key](#), the backbone of the [Relational Language Constraint](#).

The Dated column is of the DateTime type. If an insert statement does not explicitly specify a value for the dated column, then it defaults to the current date and time of the [\(UTC-08:00\) Pacific Time \(US & Canada\) time zone](#). There is a preference for the [Coordinated Universal Time \(UTC\)](#) format.

A relational constraint limit to a single foreign key? The author will choose either the most vivid or rare?

HisWord_view

The HisWord_view composes of the computed columns deducted from analyzing the Word. The two most significant computations are the AlphabetSequenceIndex, and the reliant AlphabetSequenceIndexScriptureReference, respectively. The author derives the AlphabetSequenceIndex from the word by adding the place of the alphabets in the alphabet set. In the ASCII table, the lower case alphabets are between 97 and 122, and the upper case alphabets are between 65 and 90. The lower and upper case alphabets have the same places. The AlphabetSequenceIndexScriptureReference is the books, chapters, verses separation in the scripture. The author will consider the chapter and verse place, forward and backward. Use the [AlphabetSequence.html](#) to calculate the computed values identified above. The AlphabetSequence is like [Gematria](#), [Minor Hechtrachi method](#), [Titles of God](#).

The Remember Table

The Remember table tries to correlate the period between a prophecy and its fulfillment. "The [terminus a quo](#) DatedFrom is when the prophecy begins, and it marks the date of issue or establishing of the prophecy. The [terminus ad quem](#) DatedUntil is when a prophecy partially or entirely comes to pass." (Koinonia House). [DateDifference.aspx](#) is for calculating the difference between terminus a quo, versus terminus ad quem; the results are in days; biblical years, months, days; the Common Era. The inspiration for adding the Common Era comes from [wikipedia.org](#) by Jimmy Wales.

To determine the HisWord and Remember entries? The author chooses to separate the particular and prompted inputs ([Luke 4:19](#)).

APass

First, inside and last dates.

ActToGod

This is subjective work; the author applies intelligence to find patterns and resemblances in the Bible.

Hitachi Modern Data Infrastructure Dynamics Drowning in Data: A Guide to Surviving the Data-Driven Decade Ahead

- Microsoft SQL Server offers the capability to cut off the size of the result set. The GetAPage.html gets minute data from the various database tables and views. The user may be given the opportunity to customize which results to retrieve, for example, AlphabetSequence, BibleWord, HisWord, or Dictionary. A literate person may not need as much data. Setting this restriction will be concise queries.
- An approach is to offload computing to the local host.

Database Performance

- Query optimization: Server-side database processing offers the best performance scenario. The use of stored procedures and functions is recommended. The hold backs are their deployments and SQL variances. Prepared statements are fast, resource lenient, cached, and they prevent SQL injection attacks. The author falls back on dynamic SQL for complex queries.
- Indexing: The author is well aware of the pros of indexing, but its cons include additional space and effort. The less performant productive database objects are keys and constraints.
- Data Modeling: Normalization
 - First Normal Form (1NF): A relation meets this rule when each attribute has only one value. Another condition is that all the attribute values are atomic and non-composite. In the HisWord table there may be multiple contacts, but only the most prominent contact is recorded. A contact must be first created in the Contact table, prior to its referencing, to satisfy its referential integrity constraint. The author does abide with 1NF in the HisWord table. The URI column may contain multiple e-mail addresses. The scripture reference column may not be a unit.
 - Second Normal Form (2NF): The ActToGod table does not comply with this rule, since its Minor column is functionally dependent on its Major column. Computed columns minimize the potential for this.

Database Management System (DBMS)

There are 2 types of DBMS. These are:

- Shared file-based: For example, Microsoft Access
- Client/Server: For example, Oracle, SQL Server, MySQL

SQL Usage

Database Information

Statement	Commentary
sp_server_info	The database version is Microsoft SQL Server 2019 - 15.0.2104.1
sp_databases	The sole work of the author, the WordEngineering database size, is currently 33317504 bytes.
sp_spaceused	The WordEngineering database currently uses 32536.63 MB.
sp_statistics HisWord	The cardinality of the HisWord table is 114243.

SQL Statement

Statement	Commentary
Select	The select statement for data retrieval is the most popular statement. Most select applies to Bible. Scripture_View. Using the select statement is safe, but it may impact performance. An alternate replication target repository may serve queries.
Insert, Update, Delete	The insert, update and delete statements are for data maintenance.

Where Clause Operators

Operator	Commentary
=, <>, !=, <, <=, >, >=	The operators listed will check for a single value. The operators that consist of !=, will check for non-matches. In most cases, rarely is this in use . != or/and !=>. This is the first time...he is becoming aware...of these expressions. This is the first time...he is becoming aware...of these operators. Querying for a date or number will search for particular types.
BETWEEN	This is a range check that accepts a beginning and ending value. It is not highly used.
NULL	No value
IN	A comma-delimited list of valid options within parenthesis.
LIKE	Wildcard filtering

*(Ben Forta, 2017)

Database Scaling

- The transition to computed columns results in smaller storage requirements.
- Microsoft SQL Server supports multiple databases; therefore, reducing archive needs.
- Normalization, object-to-relational mapping, is light load.

Database Exclusivity

Row Limit

Title	Commentary
TOP	Set a limit of the number of rows returned or a percentage of the rows from the source.
SET ROWCOUNT	The database will retrieve all the rows, but if there are excessive rows it will later limit to required rows .

Where Clause

Title	Commentary
Like wildcard	Preceding or following restriction '%%'
Check for NULL	IS NULL versus (VS) IS NOT NULL
Between range check	Lower and upper limits
Logical comparison	<, >, =, <=, >=, <>
Table join superceeds the previous column key equal to	FROM table join primary and foreign key

Select Clause

- Title
- Abstract
- Acknowledgments
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The select clause may explicitly include a column list. Pre-compiled statements that implicitly cater for all the source columns, may not be up-to-date on the column-list.

Group By Clause

The group by statement is not for detail listing, except when it is used to regress to the distinct clause. Group by supports statistics, such as, count, sum, min, max, avg.

Having By Clause

The having clause augments the group by clause. It places restriction on the group(s) returned.

Insert Statement

Inserts give room to omit the default columns. The Identity Insert statement also grants explicit entry of its identity column.

Nullable Column

Information unknown is useful for forwarding processing, until and if the information is added. Outer Join stands for this purpose.

View

Enhances tables by compacting and/or extending the information set.

Constraint

Primary and foreign keys, unique indexes and check constraints.

Data Cleansing

- Is the source of bad data input internal, on-line users, or error in programming? He doesn't envision error in reference data.
- Does the vendor have data definition language (DDL) to pre-empt data corruption?
 - Data type and size: String, number, date, logic boolean?
 - Not nullable? Can not be empty?
 - Range check: Expense must be greater than zero? Dates of activities must be after the establishment creation date.
 - Check constraints, for schedule, dated from must precede dated until.
 - Non-surrogate primary and foreign keys with unique indexes help to ascertain data.
 - Default columns are probable system generated that the users may leave unfilled that are available from sequence, identity, system clock.
- Is the data incomplete, such as abbreviation, for example CA or California, telephone numbers without country or area code?
- Is it data manipulation language (DML) deadlock, arrangement of data modification? Transaction commit or rollback? Cascade?
- Duplicate entries are isolatable by using the group by clause.

The author prescribes the steps below to begin database set-up and usage

- Acquire a database management system (DBMS). Various varieties of DBMS are available. The user may download a DBMS, get a compact disc, or select from the cloud.
- Install a DBMS.
- Decide on a user interface for managing the database. For Microsoft SQL Server, the choices include the SQLCmd console utility or the SQL Server Management Studio or Azure Data Studio.
- Create database. Microsoft SQL Server supports multiple instances and databases.
- The data definition language (DDL) includes the commands to create, alter, or delete tables, views, primary and foreign keys, indexes, constraints and defaults.
- The data manipulation language (DML) are commands to insert, update, and delete the database rows and columns, with the option to use the where clause.
- The SQL Server maintenance plan is for database housekeeping, for example, backup, restore, and re-arrangement.
- Stored-procedures, triggers, and functions are programmable logic.

Indexing

" (Search engine indexing)

The author manually indexes according to the following progression:

- The URI database is separable into the following tables:
 - URIChrist
 - URIEntertainment
 - URIGoogleNews
 - URIWordEngineering
- The SacredText table is for scripture reference.
- The Exact table is an index of the words in the King James Version (KJV) of the Bible.
- The source of information is in the bibliography section.

Structured Query Language (SQL)

Set theory

The set we will mostly deal with is the HisWord table. Is in order of occurrence.

Predicate logic

The choice of SQL Server impose? datatype limits.

" (Itzik Ben-Gan, 7/3/2023).

GitHub

The Author Uses the Git Code Repository		
Key	Value	Commentary
Universal Resource Identifier (URI)	github.com/KenAdeniji	This is the home page for storing the repositories.
Date Created	2013-04-27	This is the date of creating the github.com account.
Version	git version 2.29.2.windows.3	The git --version command offers the release detail. The author is not sufficiently knowledgeable on tracking the version update.
Configuration Profile	git config --list	The commands below will set the profile: git config --global user.name "your-name" git config --global user.email "your-email"
Change Tracking	git status	This will decide the differences between your local copy and the version control code repository.
Add Updates	git add	The git add . command will add all the updates, or the user may add particular directories and files.

Accessibility

- Image elements have alt attributes; so that the reader may perceive what it shows
- The software offers the option to generate an image in the .png format
- The author does not duplicate hyperlinks
- The user may solely use the keyboard navigation to tab between the various controls, this substitutes for the taborder attribute. The autofocus attribute is for setting the cursor on the first input control.

Programming

" (Microsoft)

The Author Programs in the Following Tiers and Languages		
Tier	Language	Commentary
Front-End Browser	HyperText Markup Language (HTML), Javascript, Cascading Style Sheet (CSS)	The front-end code may run on a desktop, laptop, or mobile telephone that offers a user interface (UI). The task is to accept the user query and to display the result. Initially, as a novice programmer, the author wrote specific code for each user request; later, the author rests on generic code which will handle multiple variety of requests. This is high-level programming, and the skill-set entry level is minimal. The author also believes that the users should not require any formal training to use his work. Customization is achievable by varying the request options, such as entry form selections, query arguments, or data attributes.
Middle-Tier Application	C#, Embedded-SQL	For backward compatibility, the author does not envision moving away from his legacy code investment in Microsoft. The only shift is positioning code away from database inconsistencies in back-end residency. To code, compile, debug, deploy, the experience of the author is with Microsoft Visual Studio and command-line tools.
Server-Side Backend	Standard Query Language (SQL)	The author most recent experience is with the Sybase and Microsoft Transact-SQL assortment. Now a days, to be compatible and after experimentation; the author rarely uses Standard Query Language - Common Language Runtime (SQL-CLR). The author does database data entry, maintenance, development by using the Microsoft SQL Server Management Studio.

JavaScript Basics: Data Types

- JavaScript supports three keywords for declaring variables. These are the var, let, const keywords.
- From its pre-conception, JavaScript supported the var keyword. When the author does not precede a variable initialization with a keyword, then the variable will have global scope. The author averts from variable hoisting. Variable definition with the var keyword is re-usable. The strict mode is a later addition to JavaScript that helps in enforcing variable rules.
- For one-time definitions, such as, issuing the document.getElementById command, the author relies on the const keyword.
- Unlike some typed languages, JavaScript does not support explicitly specifying the type of a variable.
- JavaScript string comparisons are by default case-sensitive.

Functions and Methods

- Methods are functions that are referable from a class. Methods support object orientation by offering encapsulation, inheritance, polymorphism. The author uses functions when placing localizable code inside the script section of a HTML file; otherwise, generalized methods are referenceable from a JavaScript library.
- JavaScript treats functions as first-class citizens, and they are passable as variables. This abstraction feature is rarely necessary.
- JavaScript does not support method overloading. The earlier arguments array variable and the later parameter default initialization supplements.
- The author consistently uses anonymous functions for processing the success and error returns when using JQuery to access web services.

Conditions

- Title
- Abstract
- Acknowledgments
- Theory
- Results and Discussion
- Terminology
- References
- Appendices
- Background
- Prophecy and Fulfillment
- Autobiography
- Style of Writing

• The author emulates the Microsoft ASP.NET Page.IsPostBack property check, and when it is not so, parse the query arguments; otherwise, skip the parsing and proceed to page submission.

Arrays and Loops

• For displaying the Bible book titles, the 66 books are in a JavaScript iterable array. This reduces the data load from the server to client, and it offers spelling flexibility. The select options resemble similar customization.

HyperText Markup Language (HTML) Document

- The DOCTYPE is the first declaration in an HTML document, and it is the conformation standard specification.
- The html tag is the root and the container for all the other tags.
- The head tag contains the title and the meta tags for the search engine optimization (SEO). The various documents will indicate the cascading style sheet (CSS) directive.
- The body tag contains the visible content of the document. Its resultSet or resultTable div will contain the particular details that the program generates.

Data Science

" (Microsoft)

What is data?

The data that the author fundamentally operates on is the word from God. The initial and primary data is textual, but now the author places importance on dates and numbers. What should you do with a number? Even though the Hebrew language is AlphaNumeric, the numbers in the Bible are in words ([Lexikus 19:26](#)). When the author receives a number, he records it in the HisWord's table, Word column, as a numeral.

1. The author extracts knowledge from data; by finding meaning to the word.
2. The author uses scientific methods, such as counting the number of occurrences, determining the first and last occurrences, and excluding the parts of speech.
3. The actionable insights take, so far, is to computerize the work.
4. The vast majority of the work is structured data. Unstructured data does not fit into the background of the author.
5. The application domain is Bible studies; how relevant is the Bible to our work?

Practicing Data Science

1. Empirical, find implication from the Bible?
2. Theoretical, to determine a better way to doing work?
3. Computational, is human labor replaceable?
4. Data-Driven, constraints help us to sanitize data. Default values reduces task, are less error prone, brings arrangement.

Where to get Data

1. The Bible is our primary source of data.
2. The author records information sources. This is either a person or media?

What you can do with Data

1. Data Acquisition: The Bible is available on the Microsoft Access database.
2. Data Storage: The author imports this tabular data into the Microsoft SQL Server relational database.
3. Data Processing: The SQL Select statement is the means of retrieving data from the database. This is not always a monolithic fashion; since there are various ways of composing the queries.
4. Visualization / Human Insights:
 - The raw data is viewable on the Microsoft SQL Server Management Studio.
 - The web service, .asmx, file, which is accessible from the browser, offers the opportunity to fill-in the query and see the JSON result.
 - The .html presents the result in a human readable format.

Defining Data

1. Quantitative Data: This makes itself subjective to numeric computation. AlphabetSequence is an attempt to give value to words.
2. Qualitative Data: These are rarely measurable and are personal interpretation.

A brief introduction to Statistics and Probability

• At the beginning of the study, the author made a presumption that words are unique. Later the author found out that there are duplicate Bible verses.

Data

" (Vaibhav Verdhan)

Structured and Unstructured

Structured data is alphanumeric put in row-column. Unstructured data is either text, image, audio, or video. This research is mainly structured data.

Standard

The author imports complete, not NULL nor empty data, such as the Bible and the dictionaries. The author achieves data validity by constraining and restricting inputs. Since this is not a commercial work, Key Performance Indicators (KPIs) are not vital. The author references and is not tampering with authoritative Bible work; this helps to make sure correctness - accuracy, consistency, integrity. Timeliness is effectual in the single user data entry table, HisWord.

Unified Modeling Language (UML)

Class

The information which the author documents in this section of the paper; is the Data Declaration Language (DDL) and Data Dictionary, which is available at [Github.com SQL Server Data Definition Language DDL Repository](#), The Data Manipulation Language (DML) is too large to fit into the Github.com repository, and it is intellectual property. For the people that have access to the database, this private information is available by generating the database script.

Contact is a primary entity, and it identifies the people and organizations that the author has a relationship with. These affiliations are family, friends, business, or public service links. Also recordable are their street, e-mail, web addresses, and telephone numbers. The author stores the various information exchanges with these people. A known date of birth, is for notification of the subject's birthday and relative age. To keep up with the privacy and sensitivity of this personal information, the author is not sharing this highly confidential data.

The relationship between a contact and its related information is one to many; that is a contact may have multiple addresses.

A URL is a link to a web resource that will add to the audience's knowledge. The author notes the address and the date, when the author became aware of this information. The content at an address is either textual, audio, video, or image? For URLs, the author rarely explicitly specifies the entire http protocol and directory post-fix, (. An incomplete address will not validate as an input url type. The author only records the [Wikipedia](#) address' at the place of reference since it is easy to associate the title with the Wikipedia address.

Exists or does not exist? The transect-sql exists clause is useful for checking the existence of an object and if so, drop the object. This is applicable prior to re-creating the object. Please note that the metadata information is lost and the create or alter statement supercedes this approach. The exists clause is also useful in queries for determining the existence of a resultset.

These classes are important asset for the anniversary triggers; in the Remember entries.

Database and Application Server Source Files

The author chose a multi-tier architecture for building the application. The database layer is made-up of tables, views, stored procedures, functions. The database tables are easily storable and movable to other storage media. The SQL Server's data definition language (DDL), now supports DateTime2, and its date range extend between January 1, 1 CE through December 31, 9999 CE. Some dates in [Wikipedia](#) mention these dates. The HisWord_view contains computed columns, which depend on entries in the HisWord table. The author extracts database information by building query statements.

The application layer is the bridge between the user interface layer and the database layer. The application layer compiles into a single [Dynamic-link library](#) (DLL), called InformationInTransit.dll. The application layer consists of four namespaces, namely, InformationInTransit.DataAccess, InformationInTransit.ProcessCode, InformationInTransit.ProcessLogic, InformationInTransit.UIInterface. What the author builds on the server; is accessible to all the clients. What is the lifetime of this code, and what neutrality does it command? The author started out with [BASE II](#). The lines of code for the application layer are in the C# and embedded SQL.

Client Browser Source Files

- [HTML5](#) (.html)
- [JavaScript](#) (.js)
- [Cascading Style Sheets](#) (.css)

The .HTML files will work in all browsers; that support AJAX. Most of the interactive web pages are reliant on JavaScript to work, mainly because they use Ajax to interact with the server. Each .HTML file, performs specific task, and may have a corresponding back-end associate, web service. The unobtrusive JavaScript file [9432.js](#) contains re-usable code that is not .HTML files specific. The .HTML files originally contained the .CSS specifications; however, the author now places styling information in a single external file, [9432.css](#). This will reduce the sizes of the .HTML files, and it helps to achieve a consistent user interface.

The work of the author is interactive, and there are links to questions and answers pages. Most of the input entries are textual, but some are numeric, datetime, select options. The answers are mostly in tabular format.

* A HTML document contains:

- Text content: The author informs the reader by describing His word.
- References to other files: The author refers to external files, such as UML images.
- Markup:
 - Elements: The anchor tag is the most specific.
 - Attributes and Values: The author benefits from the introduction of the customizable data- prefix attribute.

" (Elizabeth Castro). "

Cascading Style Sheets (CSS)

- Base Rules: A base rule is an element and not a class nor ID selector. The author does not use CSS Resets. The author issues element selectors for the html, body, table and row.
- Layout Rules: There are no layout rules, such as header nor footer.
- Module Rules: The table of content (TOC) is for page navigation that the author offers using class names.
- State Rules: A state rule is for toggling, such as using Javascript to set the visibility.

" (Jonathan Snook).

Web Services

" There is standardization on the first .NET web services architecture, ASMX. " (FrederikButhoff, 2019) In most cases, there is a one-to-one mapping between the .HTML, ASMX, CS files, and the database relational table, Bible.Scripture. For simplicity and clearance of use, the HTML and ASMX files, support one operation. GetAPage.html is the workspace for word utterances. GetAPage.html will send AJAX requests to multiple ASMX files and operations. GetAPage.html is a cumulation of separate HTML files. All the web services files support the SOAP request format and return JSON. JQuery accepts the POST, HTTP verb. The author stringified the data he passes to the web service in the body of the message. Errors are unforeseen, in the rare case, the author logs errors on the back-end, and display quantitative message. Security is lacking; this is permissible; since the author only queries information.

The web service code, .asmx, file is not necessary, does not have a place, when there is no server database access ([Numbers 19:2-2](#) [Chronicles 15:3](#), [John 15:25](#), [Romans 2:12](#), [Romans 3:21](#), [Romans 3:28](#), [Romans 7:8](#), [Romans 7:9](#), [1 Corinthians 9:21](#), [Hebrews 9:22](#)).

The Web Service Description Language (WSDL) is available, for example, by specifying the URL [AlphabSequencesWebService.aspx?WSDL](#). To generate a proxy code, issue the following command: wsd1.exe /language:CS / namespace: disco.exe "http://e-comfort.ephraimtech.com/WordEngineering/WordUnion/AlphabetSequenceWebService.disco" will generate the companion files; AlphabetSequenceWebService.disco, AlphabetSequenceWebService.wsd1, and results.discomap

A lecture of our beginning. (Hafida Na'im, 2016) The business rule is storable and processable in C#, (.cs), source files. The dynamic link library, (.dll), is callable from everywhere. GetAPage.html computes AlphabetSequence from a simple logic, which is easily representable everywhere. The AlphabetSequenceIndexScriptureReference is retrievable from the Bible, using non-complex SQL query. The BibleWord and HisWord reference, requires substantive query. The Bible dictionary returns dataset from the local database. The author can not make a

- Title
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- Terminology
- References
- Appendices
- Background
- Prophecy and Fulfillment
- Autobiography
- Style of Writing

business decision, to go to a web service, to retrieve what is locally residable.

Database Size

The `usp_DatabaseLogSize` stored procedure is for determining the size of the databases data files; and it is available at [T-SQL to find Data Log Size and Other Useful information -SQL 2000/2005/2008/R2](#)

Database Size					
Name	Data Files	Data MB	Log Files	Log MB	Total Size MB
Bible	5	304	1	82	386
BibleDictionary	5	38	1	17	55
WordEngineering	5	138	1	1816	1954

Database Standard

" When should He believe; other have represented Himself. " (ABB Asca Brown Boveri)

Database Design

1. The relational model is for storing information in tables.
2. The author normalizes data using Object-relational mapping.
3. All the databases are OLTP (Online Transactional Processing), not OLAP (Online analytical processing).
4. Avoid deadlock occurrences by not permitting user database updates.
5. All the transactions follow similar routes and sequences, and the author practices granularity with the locks.
6. Database updates are through stored procedures, which recognize and avoid the potential of integrity violation.

Database Security

1. The secretive `web.config` file contains the database access information.
2. The `web.config` file does not explicitly mention the user login name nor password.
3. Give access rights to roles, not to specific login identities nor user names.

Database Data Types

1. Choose matching data types between the database and application layers.
2. Only pick `varchar(max)` and `nvarchar(max)` as the data type, when it is essential to store large data.
3. Prefer the decimal type; when recording the amount in currency rather than using the float type.

Nullable Type

1. Consider defaulting textual data to empty string; instead of NULL.

Indexes

1. Database changes lags with indexes.
2. The field sequence in indexes should follow the frequency of usage.
3. When using a composite index, place a clustered non-unique index on the major column.

Naming Conventions

1. Overall consistency encourages lowercase keywords. Keywords in lowercase are mandatory in C# and JavaScript but not in SQL.
2. Use Pascal casing for naming literals, such as, tables, columns, stored procedures and functions.
3. Use Camel casing for naming parameters and local variables.

Performance

" (Stoyan Stefanov)

The web page components practice of the author, include:

1. Keep the count of web page components to a minimum
2. Specialize input entries by using the most simple and basic component
3. Reduce bloating by limiting the use of framework and library

Performance Suggestion

" (Lara Callender Hogan)

1. The most consistent `id="resultSet"` is usually for AJAX. The self-descriptive tags that do not influence the result normally do not specify IDs, this is left to the browser's decision.
2. Browsers place restrictions on the number of concurrent connections to a particular domain and the overall parallel connections. Consider spreading out the resources to multiple domains.
3. The author standardized on the `.png` image format because there are few colors.
4. In the year 2008, when the author tried to move away from html table layout styling, the rendering was anaemic.

The Cascading Style Sheets (CSS) performance suggestions include:

1. Since, by default, CSS is a render-blocking resource, the author should take advantage of the critical rendering path with media types and media queries.
2. All the programming `.html` files refer to the common `9432.css` file, except this ubiquitous `2015-10-23DoctoralDissertation.html` documentation file which includes `css`.

The JavaScript performance suggestions include:

1. Make use of browser cacheable content delivery networks (CDNs). For example, <http://code.jquery.com/jquery-latest.js>

High Performance Browser Networking

" (Ilya Grigorik)

For Internet connections, the contributing factors include:

1. Propagation delay - The consideration is the speed of light in the medium of transport. On the Internet the speed varies according to the medium which may be (DSL, cable, fiber) in order of performance. The speed of light, which was presumably constant, but now, may be declining. The author chooses the most accessible route. Typically, working within the confines of a building. This research excludes other participants. The environment is transplantable for other uses. The route and environment impose limitations on the local host. The `traceroute` command on the Linux operating system, or the similar `tracert` or `pathping` commands on the Windows operating system, will give travel speed. The author will look into the last-mile tendencies of the Internet Service Providers (ISP) in the area. The receive window (`rwnd`) of the server should be adequate, since the users do not upload videos nor images.
2. Transmission delay - The time to input the packet into the link, which is determined by the length of the packet and the data rate of the link. On the author's behalf, the Bible book ID is transmitted to the client and convertible to the title by JavaScript. Formatting is done by the client.
3. Processing delay - The duration of processing the header, detect bit-level errors, and determine the other end. In an Intranet environment, this is done locally.
4. Queuing delay - The processing wait time is dependent on the browser supporting multiple page tabs, and other applications using the network?

Most of the work of the author is available at the following locations, in the order of efficiency:

1. The current web page, such as, `2015-10-23DoctoralDissertation.html` file
2. The general Cascading Style Sheet, `9432.css` file
3. The general JavaScript file, `9432.js` file
4. The specific Web Service file, such as, `ScriptureReferenceWebService.asmx` file
5. The dynamic link library file, `InformationInTransit.dll` file
6. The database

The reason for noting this observation is that the Domain Name System (DNS) lookup time is low; since the author uses relative directory addressing as much as possible and only uses root addressing for calling web services. The `.html` and `.asmx` files are in numerous directories, because GitHub.com directories have content count limitations.

Images:

1. The author does not use background-image nor list-style-image
2. The thesis only contains images for database and object modeling
3. The author does not use `CSS sprite`; since it requires additional storage space
4. The author does not use Data URIs
5. The author does not support nor take advantage of Expires Headers
6. This research excludes compression and minification; because the file sizes are low and technology conformity

Code Statistics

At Danial's Cloc

```
36 text files.
classified 36 files
36 unique files.
0 files ignored.
```

```
github.com/AlDanial/cloc v 1.84 T=1.00 s (36.0 files/s, 2947.0 lines/s)
```

Language	files	blank	comment	code
C#	36	300	362	2285
SUM:	36	300	362	2285

```
414 text files.
classified 414 files
Duplicate file check 414 files (398 known unique)
```

- Title
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- Appendices
- Background
- Prophecy and Fulfillment
- Autobiography
- Style of Writing

Unique: 100 files
Unique: 200 files
Unique: 300 files
414 unique files.
Counting: 100
Counting: 200
Counting: 300
Counting: 400
2 files ignored.

github.com/AlDanial/cloc v 1.84 T=5.00 s (82.8 files/s, 10288.0 lines/s)				
Language	files	blank	comment	code
CF	414	5858	5760	39822
SUM:	414	5858	5760	39822

1 text file.
1 unique file.
0 files ignored.

github.com/AlDanial/cloc v 1.84 T=0.50 s (2.0 files/s, 3372.0 lines/s)				
Language	files	blank	comment	code
JavaScript	1	220	189	1277

Backup and Off-site Storage

The author archives the database and source files to the local computers, Google, Microsoft drives, after changes. The author uses [Github.com](#) version control.

Development Time

The development time is separable into the time it takes to program, compile, test, deploy. The stored procedure, CF, ASMX, HTML files are build-able in one day, in most use-case.

Reproducible

The deliverable of the author is transferable to other environments to reach similar conclusions.

Database Deployment

The author suggests the following alternative methods for deploying the databases:

1. [Restore](#)
2. [Attach](#)
3. [Snapshot](#)
4. [SQL Server Data Definition Language \(DDL\)](#)

Surrogate Keys

" The author takes advantage of potential natural primary keys; otherwise, the author uses surrogate keys. A surrogate key may be an identity or GUID type column. URIs are examples of natural primary keys." (Joseph Sack, 2008)

Application Programming Interface (API)

" (Consumer-Centric API Design)

- The common url scheme, endpoint, that the author prefers for security reasons is <https://e-comfort.epraintech.com/WordEngineering>
- The Top Level Domain (TLD) is the same for both the website and the API, thereby allowing for sharing of cookies.
- Content Located at the Root: The practice of the author is to place the website and their companion API files in the same directories, as they are joinable. The author will not uniquely treat API files. The author makes a case for directory browsing, and there is a special help documentation file.
- Microsoft released ASP.NET MVC on December 10, 2007. <http://stackoverflow.com/questions/41906110/designing-rest-api-endpoints-path-params-vs-query-params>
- Out of the Create, Read, Update, and Delete (CRUD) 4 operations, the API only supports the HTTP read, SQL select statement.
- Filtering Resources: SQL offers a column list, where, top, limit, and order by clauses for matching data.
- Body Formats: The load penalty in XML overweighs the newness of the JSON transport medium.
- HTTP Status Codes: JQuery satisfactorily handles the success or error of an asynchronous operation.
- Expected Body Content: Each API may currently return either a dataset, datatable, or a top level JSON object. The URI database is maintainable via a Patch request type to update a particular record's subset of fields/ columns.
- Versioning: The progress includes:
 - Migration to computed columns
 - Normalization
 - Naming Conventions, SQL for example, is generally case agnostic

"Data Structures and Algorithm Analysis"

The exact-match query is to search for a single Bible book, chapter, or verse. In the case of a verse, the top 1 clause is appropriate to efficiently return a single record. The range query is to search for information within a boundary. The Remember table's ResultOutputFirst bit column is a rare Boolean datatype. It is for documentation purposes and it says the FromUntil period is known and it is used to determine either the FromDated or UntilDated column. An identity column is a specialization of the integer data type, in that the database issues the next sequence. Most of the tables make use of the identity column as a surrogate primary key.

The aggregate or composite type attempts to store each particular type in its own table, when this is not optimum then normalization calls for several tables distribution joined within one view. The contact record is a single logical datatype spread to multiple physical implementations.

When the author hears a word, what does he do with it? He dates the word, he expresses it grammatically, and he finds a place for it in his memory. For a later date, the author reminds himself.

Problems, Algorithms, and Programs

Problem

When we hear the word, how do we endeavor in Him?

Function, Input, and Output

The input is the word as the only parameter. The output will find meaning in the word of God. The response of the computer is within the range of the result set.

Sets and Relations

The alphabets and words make-up the author's work. The composition of the words is indefinite.

- The ASCII table set composes 26 upper and lower case alphabets. Their places will originally decide the AlphabetSequenceIndex.
- The digits and their larger representations of numbers are also in the ASCII table. These are computable in determining the AlphabetSequenceIndex.
- The null character is in the Word column, when there is only commentary.
- Cardinality: Microsoft SQL Server places a limit on the maximum size of a VARCHAR column type, 8000. When there are 2 or 3 words, the author does further computation.

Asymptotic Algorithm Analysis

The computer serves the author in due time. The size of the users' input, the number of users, and the complexity of their requests will weigh on the system.

This is the approximation measurement of how long it should normally take to determine the AlphabetSequenceIndex. The prediction is the length of the word multiplied by the average period taken to determine the place of each alphabet. The growth rate is that the processing time increases, as the size of the input grows. There is linear growth, since the growth rate is constant.

Best, Worst, and Average Cases

There is no variation in time for determining the AlphabetSequenceIndex and AlphabetSequenceIndexScriptureReference. The size of the word will influence AlphabetSequenceIndex, but this should not be noticeable. When parsing and retrieving scripture reference and Bible word, there may be size and time differences.

Calculating the Running Time for a Program

The author uses a for loop to calculate the AlphabetSequenceIndex.

```
var alphabetSequenceIndex = 0;  
word = word.ToUpper();  
var ascIIA = 65;  
for  
(  
    var index = 0, lengthSize = word.length;  
    index <= lengthSize;  
    ++index  
)  
{  
    if (Isalpha(word[index]))  
    {  
        alphabetSequenceIndex += (int)word[index] - ascIIA + 1;  
    }  
}
```

The cost of executing the for loop is $\Theta(\text{word.lengthSize})$

Lists

One of the few occasions that the author uses a list is when building the Exact table. The author creates a list of words and stores this transient information in memory. The author checks the existence of each word in the list. When it is a new word, the author appends it to the bottom of the list. Otherwise, the author increments its occurrence. At the completion of parsing the words, the author stores the list in a database table. Creating the exact table is a one-time operation, and it takes a couple of hours to complete.