SQL MASTERY

THE MASTERCLASS GUIDE TO BECOME AN SQL EXPERT

JONATHAN S. WALKER

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DEDICATION

I dedicate this book to my two beautiful children and my loving wife who have been nothing short of being my light and joy throughout the years.

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INTRODUCTION

Congratulations on downloading *SQL Mastery* and thank you for doing so.

The following chapters will discuss various things that SQL is going to be able to do in order to make your job more efficient. SQL is similar to Excel except that it is going to be a more stable platform for you to use as well as one that is going to make doing your job more efficient, especially when it comes to doing the math.

There is abundance of books on this subject on the market, thanks again for choosing this one! Every endeavor was made to ensure it is full of as much useful information as possible; please enjoy

Chapter One: The Syntax used in SQL

You may have some knowledge of other programming languages, but you are going to come to realize that the syntax that is used in SQL will be extremely different from what you are used to doing. While there are rules that have to be followed when using languages such as Python, you are not necessarily going to be following those rules when it comes to using SQL.

The statements that you make in SQL are going to be identified by keywords that allow the system to know what it is that you are doing with the program. It is vitally essential that you make sure that you are adding a semicolon to the end of all of your statements when you are done writing it.

The keywords that you are going to use are going to be used to do things such as delete, alter, update, create, insert and select various statements when you are working with SQL.

SQL is one of the only programming languages that is not going to be case sensitive. This means that you are not going to have to have your words capitalized in a certain way to make sure that you are getting what you want to

be done. If you enter in update or UPDATE, the same process is going to be followed, and you are going to get the result that you are wanting. The one thing that you need to retain is that you need to be accurate with the name of the tables that are created on the SQL database or else you are going to end up pulling up a different table or no table at all because you did not put the proper name into the database for your table.

There are three programs that are going to work with SQL; they are SQL, MySQL, and Oracle. Most of the code is going to work in all three programs. However, not all of them are going to support the code. You are going to be able to pick the program that you want to use and fits your needs, but you cannot expect all of the code to work in that program. If it does not operate in that program and you need to use that code, you may find yourself having to move over to another program to get what you want to be done before you can finish out what it is that you are doing.

This syntax is going to work mostly with MySQL, and there are going to be some statements and clauses that you will be able to use with SQL.

Syntax:

Select statement:

SELECT colOne, colTwo… column

FROM nameOfTable;

Distinct clause

SELECT DISTINCT colOne, colTwo… column

FROM nameOfTable;

Where clause

SELECT column 1, colTwo…column

From nameOfTable

WHERE CONDITION;

And/Or clause

SELECT colmn1, colTwo… column

FROM nameOfTable

WHERE CONDITION 1 {AND | OR} CONDITION 2 ;

In clause

SELECT colOne, colTwo… column

FROM nameOfTable

WHERE column_ame IN (val-1, val-2,… val-N);

Between clause

SELECT colOne, colTwo…column

FROM nameOfTable

WHERE nameOfColumn BETWEEN val-1 AND val-2;

Like clause

SELECT colOne, colTwo…column

FROM nameOfTable

WHERE nameOfColumn LIKE { PATTERN };

Order by clause

SELECT colun1, colTwo… column

FROM nameOfTable

WHERE CONDITION

ORDER BY nameOfColumn {ASC | DESC };

Group by clause

```
SELECT SUM (nameOfColumn)

FROM nameOfTable
WHERE CONDITION

GROUP BY  nameOfColumn;
```

Create table statement

```
CREATE TABLE nameOfTable (

ColOne datatype,

colTwo datatype,

colThree datatype,

…

Column datatype,
```

PRIMARY KEY (one or more columns)

);

Drop table statement

DROP TABLE nameOfTable;

Create index

CREATE UNIQUE IDEX index_name

ON nameOfTable (colOne, colTwo, …. ColumnN);

Chapter Two: SQL Statements

SQL offers multiple statements that you are going to be able to work with. These statements are going to be what creates the foundation for your table. Every statement that you create in your table is going to do what you are wanting to be done in a single step rather than several steps where you may

find yourself messing up because you lose track of where you are in your statement.

Drop table statement

The drop table statement is going to remove the entire table from your database. You may discover that just deleting the table is going to ultimately end up creating problems later on when you are working with that database. But, with the drop table statement, you are going to be able to skip over these issues and move on to deleting the table so that you can start over.

Syntax:

DROP TABLE “table_title”;

Multiple tables can also be deleted at the same time all you are going to need to do is put the name of the table in the syntax, just make sure that you are putting commas between the names of the table

At the point in time that you cannot find the table in the database to delete, you are going to get an error message. You will need to ensure that the table

actually exists before you try and eliminate it. If you search the database and cannot locate the table, you are going to have no need to delete it.

Truncate table statement

When the data in the table needs to be deleted, but you want to keep the table structure, this is where you are going to be able to use the truncate table option. Once all of the data is out of the table, you are going to be able to use the same structure and enter in your new data.

Syntax

TRUNCATE TABLE “table_title”;

One thing to keep in mind is if you have a constraint in place, the data is not going to have the ability to be deleted from the table until you remove that restriction.

Select statements

Select statements are the statements that you are going to use when having to

search through the database for information, however, this is not going to pull up just any information; it is going to allow you to be able to find specific pieces of information by using one of the five clauses that are available for you to use with SQL.

Syntax

SELECT [ALL [DISTINCT] column 1 [, column 2] FROM table 1 [, table 2] [WHERE “conditions”] [GROUP BY “column-list”] [HAVING “conditions] [ORDER BY [“column-list” [ASC [DESC]]

Chapter Three: Creating a Database in SQL

In order to create a database in SQL, you have to use the statement that was specifically set aside for you to be able to create a database. Whenever the database has been established, you are going to have the ability to start creating tables in that database for you to begin working with.

Syntax

CREATE DATABASE Databasename;

Each and every database that is created will be assigned a unique name so that you are able to locate them later one when you want to use them. RDBMS is going to use this name to find the database so that you do not have to locate it yourself in all of the databases that you may have created.

Before you can begin creating databases, you are going to need to make sure that you have administration privileges. With these administrative privileges, you are going to have the option to create the tables that you need to build and input the data that belongs to those tables.

Chapter Four: Data Types Used in SQL

Data types are used when creating tables. It is required that you pick one data type for that column in the table based on what you need that column to do

- Byte: a set of numbers between zero and two hundred and fifty-five. There is only going to be a single byte of storage for these figures.
- Singles: a floating point number that will be associated with a decimal. Singles are going to contain up to four bytes of storage
- Currency: there can be up to four decimal points for currency, and it can go up to fifteen places in whole numbers. There are around eight bytes of storage for currency.
- Long: a long is going to have four bytes of storage and fall between -2,147,483 and 2,147,483,647
- Memo: memos will hold larger amounts and can go up to 65,536. Memos have the ability to be searched but not sorted.

- Text: letters and numbers that are entered into SQL are going to be text, and it can handle up to two hundred and fifty-five characters
- Date and type: with eight bytes of storage, the data and time is going to be obvious.
- Double: just like singles, a double has two floating point numbers and contains eight bytes of storage.
- Integer: you are only going to be able to store numbers in this data type. It is going to be between the numbers of -32,768 and 32,767. You have 2 bytes of data that can be stored here.
- Look up wizard: this is your options list so that you can choose what it is that you want to do. This has 4 bytes of storage.
- Auto number: the fields are going to be given their own record for data with its own number. It is going to start out with one unless you state otherwise. 4 bytes of data are saved for the auto number.
- Hyperlink: you are going to be capable of sending the user to a web page if it is necessary.
- Yes and no: the logical fields that require answers like yes or no or even true or false. The true and false answers are going to be equal to negative one and zero. If no value is allowed, then that field is going to be null. The storage is 1 bit.
- Ole object: pictures and other multimedia will be placed in this data

type. It is known as a blob which stands for large binary objects. You have the most significant storage amount here, and it is one gigabyte.

Data types are going to fall into three main categories, date and time, numbers, and characters.

Character:

- Varchar(size): the length of the string that is stored will be able to hold all of the data types that we just talked about. The size is going to be based on what the number is that is in the parentheses. Normally it is going to be texts that you convert.
- Char(size): the character string is a fixed length that can be the data types that were previously discussed.
- Blob: there are 65,535 bytes of data that can be held with a blob.
- Tiny text: you are only going to be able to put two hundred and fifty-five characters in the small text.
- Long text: this is going to hold up the largest number of characters.
- Text: this is the standard character text that holds up to 65,55 characters.

- Medium text: this is going to hold around sixteen million characters at most.
- Set: this is going to be similar to an enum type but is only going to hold up to sixty-four items, however, you can store more than one data type in it.
- Medium blob: this holds up to sixteen million bytes of data
- Long blob: this is going to hold the most bytes of data hence why it is called a long blob.
- Enum(x, y, z…): every possible value is going to be listed in an enum. It can hold up to 65,535 values. Anything that is not inside of the list will be shown as a blank value. The values do not have to be put in order when they are entered; they can be sorted at a later date.

Number:

- Float(size, d): this is considered to be a tiny number that uses a decimal that can float. The size of the parameters is going to be the maximum amount of values that can be put into the data type. The d parameter is going to be the largest amount of numbers that can be to the right of that decimal.

- Tinyint(size): you can have -128 to 127 signed values or 0 to 255 unsigned values.
- Bigint(size): you can have 9,223,372,036,854,775,808 to 9,223,372,036,854,775,807 signed values or 18,446,744,073,709,551,615 unsigned values.
- Smallint(size): you can hold up to thirty-two thousand signed values or sixty-five thousand unsigned.
- Int(size): holds a set value of signed and unsigned values.
- Medium(size): holds up to sixteen million unsigned values.
- Decimal(size,d): you are going to be able to store decimals inside of a fixed point that are inside of the size parameters. The parameters are going to be set by the maximum amount of digits that are found to the right of the decimal.
- Double(size, d): this is similar to the decimal(size, d) but the number of digits that are to the right side of the decimal is going to be set by the parameter which is going to be d.

Date and time:

- Date(): dates are going to be entered in the year, month, day format.

- Year(): the year is going to either be inputted in two digit form or four-digit form. It is going to be based on what you are doing that will depend on how it is entered.
- DateTime(): you are going to be putting in a combination of the date and time. It will be recorded as the date() is and then the time will be entered hour, minute, seconds.
- Time(): time is entered hour, minute, second.
- Timestamp(): the time stamp is going to match what the current time zone that you are in so that you can see exactly when something was done. It will be entered like the DateTime().

Chapter Five: SQL Query Types

With searches in SQL, you are going to be able to find specific pieces of data so that you do not have to search through the entire database. This makes your searches more efficient due to the fact that you are not going to have to go through the whole database to find what it is that you are searching for.

Insert query

The insert query is going to look at the new rows of data that are placed in your table. In doing this search, you have to deal with knowing which of the two searches that you are going to use depending on what type of information it is that you are trying to locate.

The syntax for searching in a particular column.

With this query, you are going to be inserting data into a particular column.

INSERT INTO NAMEOFTABLE (colOne, colum2, column3, … column)

VALUES (value1, value2, value3, … valueN);

Syntax for inserting data wherever it will fit on the table

INSERT INTO NAMEOFTABLE VALUES (value1, value2, value3, … valueN);

The insert query can also be used to select data that is located on another table and copy it to a completely different table without the worry of missing any of the data that is located in that table because all of it is going to be copied and moved over to where you want it to be moved over to.

Syntax

INSERT INTO first_table_ame [(colOne, colTwo, … column)]

SELECT colOne, colTwo, … columnN

FROM second_nameOfTable

[WHERE codition];

Select query

With select, you are going to be locating data in your tables in your database so that you can get a result returned to you. These results are going to be referred to as result sets.

Syntax:

SELECT colOne, colTwo, column FROM nameOfTable;

The data from those specific columns is going to be what you are wanting to be returned to you; therefore, the database is going to do so.

However, should you want every field returned, you are going to use this code.

Syntax:

SELECT * FROM nameOfTable;

Update query

As the name indicates, an update is going to be used to change any records that are already on the table you are working with.

The where clause can be used as you are using the update query so that you can modify specific rows rather than changing all rows in the table.

Syntax

UPDATE nameOfTable

SET colOne = value1, colTwo=value2, … columnN = valueN

WHERE [condition];

The N is going to be able to be used with any condition when you are using the or as well as the and operators.

Delete query

Whenever records need to be removed from your table, you are going to use the delete query. Just like with the update query, you are going to be allowed to use the where clause so that you can eliminate a set number of rows rather than delete everything that is on your table.

Syntax:

DELETE FROM nameOfTable

WHERE [condition];

Conditions have the ability to be combined when you use the and operator as well as the or operator.

Sorting your results

The order by condition is going to be the clause that is used when you are sorting the data in your table. You have two options, you can sort the data in ascending order, or you can do it in descending order. There are going to be some databases that are going to automatically sort your results in ascending order without you telling it to. So, if you have to have it in descending order, you are going to need to ensure that you have told the system that you want it sorted a different way.

The syntax for sorting the results that you get from your queries is going to be

similar for both ascending and descending order. The only difference is going to be which order you want it to be sorted in.

Syntax:

SELECT column – list

FROM nameOfTable

[WHERE condition]

[ORDER BY colOne, colTwo, …columnN] [ASC | DESC];

Multiple columns can be selected when you use the order by clause. However, make sure that the columns you are choosing to be sorted are in the column list.

Chapter Six: SQL Constraints

The constraints are a set of rules that are enforced by the SQL system whenever you are working with the columns that are located on your table. The record that you are working with is going to limit the various data types that are going to be allowed into that particular database. These constraints are going to be put into place to ensure that the information that is in the database is reliable and accurate. You will find that this is helpful whenever the database is being used by other people.

You do not have to limit your constraints to just the columns either. Restrictions can be placed on an entire table if that is what is necessary. Any restrictions that are placed on just one column are going to only be enforced for that column, therefore, they are not going to affect the rest of the table. But, whenever they are placed on the entire table, the whole table is going to be under those rules.

- Not NULL: the column is not going to have the ability to have any null values
- Index: the index constraints will not only create, but they will retrieve data that you have in your database.

- Default constraint: if you do not set a default value, then one will be provided for that column.
- Check constraint: this limitation will make sure that any conditions placed on the column are met.
- Unique constraint: there are not going to be any values in your column that are going to be the same, each value is going to be unique.
- Foreign key: records in other database tables are going to be identified with the key.
- Primary key: in the table that you are currently working in, each record is going to be identified.

When it comes to creating the table that you are going to be using, you are going to have the option of putting the constraint right there in the code so that it is enforced at the beginning. However, sometimes you forget to do this, or you find that you need to place the constraint later on due to some other circumstance. You can still put the constraint in the code by using the alter table statement so that the constraint is enforced despite the fact that you have already created your table.

Dropping constraints

A constraint that is already in place can be dropped when it no longer has to be used. By using the alter table statement, you are going to be allowed to drop the constraint so that your table or column can be free from that particular restraint.

Depending on which constraint it is that you used, you are going to have the opportunity to use a shortcut that is going to assist you in getting rid of the constraint. But, it is also going to depend on which application it is that you are using because each application is going to work differently from each other.
You do not always have to drop a constraint though; you do have the option of disabling the constraint so that it is still in place for that particular database, but it is not being used at that present moment. Doing this is going to make it to where the data that is under that constraint will continue to be under the constraint whenever you turn it back on. This is helpful when you need to look at various situations that could be happening with the data that you are working with. It also helps when you do not want to remove the constraint from the SQL table's code.

PART 2

Chapter One: A Brief Overview of Python

If you do not already know, Python is a programming language that is going to make it to where you can write out your own code and create your own programs. Python has the functionality to be used across any platform while making the code easy to read and user-friendly. That way, should someone else have to touch the code that you are working on after you have created it, then they are going to be able to know exactly what it is that you were working on.

If you are still unsure about Python, think of it this way, Python is similar to if you were to sit down with a pen and a piece of paper and write out exactly what you are wanting the program to do. The only difference is that a computer is going to be doing it instead of you doing it yourself.

Python has many different versions that are going to be able to be used for whatever it is you are doing on your coding adventure. There is even one that is going to allow you to write programs in Java while still working on a

Python platform. Python is written primarily in a single language, but it has been made versatile enough that it can interact with other programming languages out there so that you are able to run almost any program that you want to run on it. This was done by the developers and volunteers of Python because every program is going to respond differently to the environment that it is placed in.

Another great thing about Python is that if you are able to put it into your computer, then it is going to be able to work on Python. So, images, text, numbers and even scientific data can be put into Python code so that it can run in the program that you are developing.

One of the things that you may not realize is that you are using Python almost every day. Do you use Google as a search engine? Then you are using a website that was developed using Python! Other sites such as the New York Stock Exchange and the NASA website run on Python as well. That is just a fraction of what you are able to do with Python.

The syntax and commands that you use with Python are going to be different than any other interpreted programming language that you may have used before, and that is something that you are going to be able to see as you go through and learn the basics of using Python.

When looking at Python and various other programming languages that you have the option of using, you are going to realize that they are not only going to

be used in career fields that are going to change our lives now and in the future.

Application and program: the programs that are used by people on a daily basis are going to be things such as the applications that are on your phone and the programs that you are going to use on your computer for work.

Artificial intelligence: artificial intelligence is the future where machines are able to be programmed to interact with humans and how they behave. Not only that, but they are going to be able to be programmed so that they can learn and adapt to the world that is going on around them. Some of the things that you can see now are the chat boxes that you use to get support without talking to a person, or how your character interacts inside of your video games.

Games: do you enjoy video games? Well, many video games are written with Python code as well as other programming languages. Not only are the video games that you enjoy on your gaming console written in this code, but so are the flash games that you place online.

Databases: databases are going to be maintained through the use of Python code. Databases are meant to hold massive quantities of data that has been digitalized so that other people have access to it.

Computer drivers and hardware development: the use of Python for this is meant to make it to where you can focus on the mind support to make sure that your devices are running at peak performance.

Web creation: as mentioned multiple times, many web pages that we use on an everyday basis are going to be written in Python code. If you do not have web pages, then you are not going to have the internet.

Script development: when someone knows scripting, they are going to be able to benefit their company and even help up the productivity of their business by assisting them in making programs run more efficiently.

It is almost impossible to escape Python because it is ingrained in our everyday life. There is nothing that we can do about it. However, if we learn to use it, then it can benefit us not only personally, but professionally as well!

Chapter Two: Data Types Found in Python

Data types are going to be the values that you place in Python. That value is going to be evaluated and then put to its proper use after the program figures out what data type you have inputted. If this is confusing, look at it as the value you are wanting to use an object. That object has to be placed into the correct box so the program will identify that object type and then put it where it belongs so it can be used correctly.

There are going to be two different categories that data types are going to fall into when you are using them. There are the data types that are mutable which means that you are going to be able to change them even after you have put them into the program. The other category is immutable data types which means you are not going to be able to change it once you have put it into Python. These data types have to be checked before they are put into Python so that you can ensure that you are not adding in any data that you do not want to be in the program.

Numbers

Numbers are going to be numeric literals. This is one of the data types that are going to be immutable. The number data type can be broken down even further into three categories. Integers, floating point numbers, and complex numbers.

An integer is going to be positive and negative numbers, but they are not going to have any fractional parts. Integers have the ability to work with subtypes such as Booleans.

Floating point number is also a negative or positive number; however, it will have the fractional parts that an integer lacks.

Complex numbers are used more when you are working with engineering programs in Python due to the form that a complex number follows. When you are working with complex numbers, you are going to put them in the a + bi form. The I in the equation is going to be the imaginary number that you are going to be using as you use complex numbers. Therefore, the most important thing to remember when you use complex numbers is that there are not only real numbers that you have to work with but imaginary ones as well.

Strings

Strings are going to be objects that you combine together and will be read left to right by the program. A set of quotes will start and end the string so that the program knows what data type you are working with. Just like number data types, strings are immutable.

You are going to be authorized to use double or single sets of quotes when you are writing strings. It does not matter which set of quotes you use, as long as you use the same quotes when you end the string as you did when you started it. Using a single quote at the beginning of the string and a double quote at the end

is going to end up having Python send out an error message telling you that it is not able to read the string and therefore cannot execute your command.

Strings are going to come with an index that begins with zero on the left side and a negative one on the right side. This index is going to tell you where everything in the string is located. Therefore, you can use the index for the string to find an object that is in the string faster than going through the string object by object.

You are also going to be able to use a splicing method that is going to take the string and cut it so that it becomes another string from the moment you cut it up to the point you tell it to stop. When you are splicing the index, you are going to use a colon separating the number where you want it to start the splice and the number you want it to stop on.

For example, if you are wanting to splice an index at 3:8 you are going to get the objects in the third space all the way up to the seventh space in a substring. The eighth place is not going to be included in the splicing.

Tuples

A tuple is like a list except it is not going to have a set of quotes around it, it is going to be objects inside of a set of parentheses that are separated by commas. Tuples are going to be immutable as well.

An empty tuple can be created by using a set of parentheses and placing empty_tupl in between the parentheses so that you are able to start with a tuple

from scratch. When you are starting a new tuple, a plus sign is going to be used in the set of parentheses. In order to duplicate a tuple, you will use an asterisk. Tuples have an index just like a string does and you are going to be able to splice the index of a tuple just as you can with a string; you are going to follow the same rules as you would with a string in order to create a spliced tuple.

List

A list is the exact same thing as a tuple except instead of the parentheses you are going to use square brackets instead. Lists do not have to have the same data type through it; you are able to add in multiple data types in a list.

When you are wanting to create an empty one you are going to use the function print(my_list). In splicing an index for a list, you are going to use the following syntax.

Sliced_list = list_name [start index: end index]

Sets

A set is going to be created whenever you have elements that are unique but not in order. Sets are primarily used for set theory which is going to be supported by mathematical operations such as union, symmetric difference, and intersections. Sets are also going to be useful in the event that you need to eliminate any entries that are duplicated in your code.

Chapter Three: Lists in Python

A list in Python is going to be named whatever you want to name it. It is wise to identify it in such a way that you can locate it not only later, but also so you know what you are using it for in your programming. The data types that you place in a list is going to be tracked by Python.

Here are some of the functions that you are going to use with lists in Python.

- list.pop([i]) : to remove items from the position they are currently occupying before it is added back to the list. When you use the a.pop() function, then your item will be put at the end of the list.
- list.append(x) : an item will be added to the last position on the list you are working with.
- list.remove(x) : to remove an object from your list, you are going to use this function. If you get an error message, the item you want to get rid of is not on your list.
- list.extend(l) : this function is going to extend your list by appending the objects on your list.
- list.insert(I, x) : you are going to use this function when you want to place an object in a particular position on your list.
- list.reverse() : the items on your list are going to be reversed from the

order that they are currently appearing in.

- list.index(x) : your index is going to be returned to the first item. An error message means that the item does not exist.
- list.sort(cmp= none, key= none, reverse= false) : the arguments on the list are going to be able to be customized.
- list.count(x) : all of the times that an object appears on the list you are working with will be returned.

Chapter Four: Python Modules

Modules are considered to be the files that contain statements and definitions that you are going to use in Python. With the name of the module, you are going to be enabled to locate strings that contain global values. The module file names are going to contain the same .py extension as other Python files.

You should not stop using the interpreter when you are working on a script in Python, or else you are going to end up losing everything. If you are unable to stick with Python for the entire process of writing your code, then you should place it in a different program and work on it there until you have the time to work with Python.

Example:

```
#num mod
def num(b): #you will write the sequence of numbers up to b
        a, d = 4, 2
        while k < b:
                print k
                a, d = d, a + d
        def num 3(l) #return the sequence up to l
        result = [ ]
        a, d = 5, 9
```

```
while e < u
result.append(m)
        a, d = d, a + d
return result
```

At this point in time, you are going to let the Python interpreter read the file that you import so that it can be executed. If you place anything into Python under this sequence, even if it is at a later date, then it is going to access the functions that are inside of Python for that particular sequence.

Chapter Five: Python Functions

The syntax for a function in Python is going to be:

```
def function name (parameter1, parameter2, …):
    # code here
```

If you notice, there are going to be parameters that are going to enable you to have a certain number of items that are callable. Any objects that you get returned you based on your function is going to be placed inside of a tuple due to the fact that you are most likely going to have multiple objects returned.

In the event that you do not have any parameters, then your syntax will look the same as the syntax above; however, the parameters are not going to be there making your parentheses empty.

Functions are going to appear similar to modules, but they are not the same thing. Modules and functions are going to work together while having their own definitions in the Python code that you are creating, but this definition is not going to be printed in your code.

Functions also use statements rather than giving you the result of your parameters that are put into place.

Essentially, functions are blocks of code that are going to be organized as well as be reusable in order for you to perform an action that is going to be related

to what it is that you are doing.

When you do not use a definition that is already programmed in Python, your function is going to be known as a user-defined function. If you are going to be defining your own functions, you should try and keep these five things in mind.

1. You do not have to include the first statement in your function if you do not want to.
2. The statement that is returned is going to have to pass through the original expression that started your entire function. If you do not have arguments set on your return statement, then you are going to get the same return or no return at all.
3. The parameters that are inside of the set of parentheses have to be defined.
4. Ensure you are putting the keyword def before you write your function due to the fact you have to define your function.
5. Any blocks of code that you are working within a function have to be indented.

Syntax for defining functions:

```
def function name ( parameter(s))
        function_docstring
        function_suite
        return [expression]
```

The thing you have to remember about your parameters is that you have to

inform Python of those parameters in the same order that they were defined in.

Example

```
def print you(tup):
#this tuple is going to be printed into your function
        print tup
        return
```

There are four function arguments that you are going to use to define what the parameters are for your function.

1. Keyword arguments
2. Variable length arguments
3. Default arguments
4. Required arguments.

A required argument will have to go back through the function in the same manner that it was first defined.

Example

```
#!/ usr/ bin/ Python
#your function is going to be defined here
def you( tup ):
"The tuple will be printed in this function."
        print tuple
        return;
#now you are going to call your function
print you()
```

Keyword arguments enable you to place your parameters in a different place without receiving an error because the interpreter is going to match the parameter with the keyword.

```
#!/ usr/ bin/ Python
#the function's definition
def print you(tup):
#your tuple will be printed and placed into your function.
        print tuple
        return
#you now have the ability to call on your function
print you(tup = "I created this tuple")
```

Default arguments are going to be the default value that Python places into the function whenever there is no value provided.

```
#!/ usr/ bin/ Python
#function definition
def printinfo (birthday, birthyear = 1989):
#The info will be printed into your function
        print "birth day:" + birthday
        print "birth year:" + birthyear
        return
#here is where the function will be called upon.
printinfo(birthyear = 1989, birthday = 2)
printinfo(birthday = 2)
```

Variable length arguments are used when processing functions to see if

multiple parameters have to be placed into the definition.

Syntax

```
def functionname([ formal_args] * var_args_tuple):
        “function_docstring”
        “function_suite”
        return [ expression ]
```

The asterisks are put before the name of your variable that holds the values that do not have any keyword variable arguments. Therefore, your tuple is going to be returned to you empty.

Chapter Six: Operators in Python

Python allows you to do math just like you would with a calculator. Not only can Python do simple math, but it can also do the complex math that you may need a little assistance on. All you are going to have to do is place the equation into Python, and you will receive the correct answer each time that you put it into the interpreter as long as you are able to enter the equation into the prompt correctly.

The most common operators that you are going to use in Python are as follows.

- Math.sqrt(a): square root
- A + b: addition
- A**b: exponent
- A – b: subtraction
- Abs(a): absolute value
- A*b: multiplication
- a/b: division
- -a: negation
- a//b: floor division
- a%b: modulo

Whenever you are using the square root function, Python has to be informed of

what you are trying to accomplish. This will be done by loading the proper math module. In order to do this, you are going to have to have the proper code to input into the prompt.

One of the bad things about math and Python is going to be how Python places limits on what you are going to be able to do with floating point numbers and the rounding of the decimals that are returned. This is where Python tends to give some pretty unexpected results.

For example, regular division for 0.9/0.3 will give you the result of 3.0. But, when you are using floor division, you are going to get a different answer.

The rules of math in Python are going to follow the same rules that you learned when you were learning basic math in school. Remember when we said that Python is going to be exactly like if you were to take a piece of paper and write out what you wanted to happen. Well, here is a prime example.

Along with reading your work left to right, Python is going to follow the rules of PEMDAS when it is executing mathematical equations.

P: Parentheses

E: Exponent

M: Multiplication

D: Division

A: Addition

S: Subtraction.

Whenever one component is not found for PEMDAS in the equation that one is skipped over and the interpreter will move on to the next one.

Example

(9* 3) – 3 + 12 / 2

P: (27) – 3 + 12 / 2

E: none

M: (27) – 3 + 12 / 2

D: 27 – 3 + 6

A: 27 – 9

S: 18

Therefore, your answer is 18.

While the answer for this was a nice, neat whole number, not all math is going to give you a whole number. There are going to be times that you are going to have to work with a decimal that contains multiple decimal places. Python was designed to automatically print out up to ten places unless you use the round() function.

The round function is going to allow you to pick how many places your values are rounded so that you do not have to go out ten decimal places.

Example :

```
print(round(3.4562346984, 5)
```

result: 3.45623

Python also enables you to assign a function inside of another function so that you are able to get the answer that you are desiring. This is going to be known as nesting functions, and it is going to work the same way that a regular function is going to work, except you are going to be doing two different equations in one step rather than two.

Chapter seven: The Formation of Strings in Python

As you learned earlier, strings are modules, but they are going to have different constraints put on them as well as classes that you are going to find to be useful. Strings have the ability to hold depreciated legacy functions that only going to work with strings. Different string types have modules built into them so that they are able to support sequencing methods.

When you are wanting to format the output of your string, you have the option of using a template, or you can use the percentage sign. Another option is to use the str and Unicode classes that are located in Python. These functions were put into place by Python so that you had assistance when it came to multiple variable substitutions along with formatting the values that are inside of the string through the use of the str.format() function.

A formatter class can be found in your string's module so that you have some help in customizing your formation of the strings and the way that they behavior all through using the same technique that you used when you were using the format() method.

The formatter for your strings is going to follow the same public method of class string. Formatter.

The initial method that you will use when using the formatter is going to be:

format(format_string * args ** kwargs)

Your formatter has the ability to define various methods that are used in Python so that it can replace the subclasses later on in your string.

parse(format_string) : this function is going to cross the string that you have formatted and then return a tuple to you so that you have all of your data in one organized place. Along with the vformat() function, you are going to be taking your string and putting it into a literal text or replacement field.

The values that you put into the tuple are going to be representing the literal text that is going to be followed by a replacement area. In the event that you do not set any literal text into your string, then the literal_text is going to give you a string length of zero. Having no literal text can end up happening if you have two replacement fields that appear consecutively.

Should you not have any replacement fields, then your value field name and the format specs will be returned as none.

get_field(field_name, args, kwargs) : your field name is going to be returned as parse() so that you can convert the objects that are in your string in order to allow them to be formatted. The tuple that is returned is going to be (obj, used_key). Any default versions that are used is going to be defined by PEP3101.

Each formation technique that you can use in Python is going to have a name with it, and the parameters and keyword arguments that are put into place are going to have to go through the vformat() in order for you to get the return of your critical parameter.

get_value(key, args, kwargs) : any field value is going to be retrieved inside of the list that is given. The key argument is going to either going to return a string or an integer. If you get an integer, then there is going to be an index that is going to have a positional argument. Should a string be returned, then you are going to be using the kwargs.

The parameters are going to be going to be set inside of any list for the positional arguments that use the vfromat() technique. Keyword arguments are going to be the keyword arguments that are set inside of the dictionary for that string.

When the field names are compound, the function is only going to have the ability to pull the first item that is on the name of that field. The name is going to be found once you get your result for get_value() by using the getatter() function. Both of which are automatically in a Python module.

Keyword arguments and indexes are going to tell you about objects that may not exist inside of Python. If this is the case, you are going to end up getting an error that is there to tell you what you are looking for does not exist and that

you either need to put it into the prompt or you are going to have to choose another object to search for.

check_unused_args(used_args, args, kwargs) : whenever you are checking for arguments that have yet to be used, you are going to need to use this method. The arguments that are set up with the argument keys are going to be tied to the string that you have already formatted. This also includes arguments such as integers, strings, and positional arguments that have been used for a named argument.

Kwargs are also going to be referenced after they have been put through vformat. The unused arguments are going to be calculated by using the parameters that have been set in place. In using the check_unused_args() function, an exception is going to be raised that should be failing your check.

format_field(value, format_spec) : this is the global formation that is going to be the same as if you were using format_field(). The format_field method was created in order to allow subclasses to override it when necessary.

convert_field(value, conversion) : values that are returned from the get_field function have to be converted as well. The default version is going to have to use str () or repr () for the conversion type that you use with Python.

PART 3

Introduction

Whether you're just breaking into the world of online marketing or you're an expert looking for the latest SEO trends, this book is for you. This book will show you how to make your website stand out from the sea of other similar websites while also honoring the unwritten internet ethical code. Learn (or refresh your memory on) the basics of Search Engine Optimization and see what 2017's trends can do to build up from the basics.

This book won't go in-depth with technological jargon that beginners may not understand. Instead, it will explain the basics of SEO as simply as possible, putting an emphasis on managing content. At the same time, it will take a look at the latest trends relating to content according to the top online marketing experts and list off what they all agree you should use. If you're an expert in online marketing, don't overlook the basic beginner strategies because there's information there that could still apply to you. Just like a little black dress, there are trends in SEO that never go out of style.

While the names and corporations used as examples in this book are fictional,

you can learn a lot from what happens to them. Think of it like watching a mockumentary, like *The Office*.

Without further ado, let us begin.

Chapter 1: Strategies for Beginners

What is an SEO keyword?

SEO stands for “search engine optimization.” Basically, it's a tool to make sure that your website is easy for search engines such as Google to find. The way that search engines work is that they read the content of your website and analyze it, looking for topics and keywords, and puts your page in their index. Then, when someone searches for your site, your page will come up in the search results.

Say that you are a wedding planner and that you have a website advertising your services. If you want your website to be found whenever someone types in “wedding planner” in a search engine, you need to make sure that your website has the word “wedding planner” beyond just the title page. The words need to be in the content of your web page.

What other words will you need if you have a wedding planner website? Here are some keywords:

- a wedding planner list

- wedding planning service
- wedding planner checklist
- wedding planner cost
- wedding planner budget
- wedding planners near me

If you want to find keywords for your website, check out websites like keywordtool.io or wordtracker.com which give you a sample list for free and provides keywords for search engines such as Google, Bing, and Amazon. It also provides keywords for international search engines, which is great if you don't live in the United States.

How does Google rank sites?

Google ranks websites based on how relevant and useful they are to whatever is being searched. A search for “wishing well” usually brings up images of a well or the song “I'm Wishing” from Disney's *Snow White* since the words “wishing well” are in the lyrics. The way they determine which websites are most useful and relevant depends on a complex program. However, what most SEOs know for certain is that sites are usually ranked by the following factors:

- how often a certain keyword is used
- the structure of the website
- how fast the website is
- how much time people usually spend on a website

Simply put, getting your website to be put first on a Google search depends on content and image. By content, you need to make sure that your website has keywords that relate to what you think people will search for.

What works? What doesn't? What's trending?

One current trend that beginners and experts can both do easily is collaborating with other websites and writing guest posts on blogs. This can go beyond two people collaborating on a movie review.

Nonprofit organizations often rely on collaboration in order to make their projects successful. The Wishing Well is a nonprofit organization that organized fundraising to make their clients' dreams come true, such as aspiring comic book artist Jim Bartlett.

After talking with The Wishing Well, Jim created a website promoting a fundraising event: a special historical tour of his hometown. The Wishing Well wrote an article on Jim's website that contained details of the fundraising event. In that article, they talked a little about themselves, but they gave more attention to Jim's comic and what Jim planned to show in the hometown historical tour. Not only was the tour a success for Jim, but it brought a whole new customer base for The Wishing Well.

Another basic technique you'll need to know is to understand analytics. Most people use Google Analytics to track how well their website is doing. Google Analytics shows you how many people visit your site every day, what kind of people visit your site, which pages and posts got the most views, and how long people stay on your website. You will need to set up an account on Google in order to use Google Analytics, but it's a worthwhile investment.

Make sure that you and only a handful of trusted people can gain access to the analytics. You don't want anyone hacking into your data. Once you linked Google Analytics to your web page, it will give you a tracking code that you can put on your webpage.

One benefit of Google Analytics is that it can help you keep track of the goals you set for your website. Let's say that you want a hundred people to subscribe to your website by Christmas. When you go to Google Analytics, you can set up a goal according to whatever milestones you have in mind for your website. Once the goal is set up, Google Analytics will measure your website until that goal has been met.

The most important technique you'll need to know, whether you're a beginner or an expert, is to make sure your content is top quality. Stay relevant and keep a good relationship with your audience. Ask them for feedback. If you're creating a website dedicated to sharing and reviewing mystery books, make sure that your website has quality book reviews of the latest novels from authors such as James Patterson and Michael Connelley.

Take advantage of visual content as well. Just don't put super-large images on your website, as big pictures tend to slow down a webpage's loading time. Trust me when I say that you don't want a slow website. It will drop your website down in the search engine rankings. Just like with pop stars, the popularity of your website will have to look good and make users feel like

they can relate to your content.

How does SEO work with social media?

When you share your web page on social media platforms such as Facebook or Twitter, make sure that your most important SEO keywords are in the URL (www.exseo.com/important-keyword-here).

Don't limit yourself to just Facebook or Twitter. Try promoting your stuff on Instagram and Pinterest, especially if you're selling a product. Mimi Lu has an Etsy store where she sells her handmade dolls and stuffed animals and she posts pictures of her products on Instagram since she has a large following.

Make sure that you still include keywords when you post pictures. Mimi usually uses hashtags in her Instagram posts. Her picture of the stuffed bunnies she made for Easter are tagged with #handwork #handmade #handcrafts #sewing, #felt #easterbunny #toys #bunny #crafting. Figure out which hashtags work best for your product and put them below the description.

Chapter 2: 2017 SEO Trends For Marketing Experts

Going Mobile

Today, more people search for things on their mobile devices than desktop computers. It seems like everyone has a smartphone or a tablet. When it comes to searching for websites on mobile devices, how fast a website is what matters most. If a website is slow to load, potential viewers and customers will be lost.

Accelerated Mobile Pages (AMP) are what your website would look like on a mobile device. AMP eliminates all the unnecessary information of your web page and strips it down to its most basic level.

The good news is that since mobile versions of web pages are so simple, it will make it easy for you to make an AMP version of your website. Just make sure that the mobile version of your website has all the important and relevant information in its content. Structure the

content of your site with easy consumption in mind. Use bullet points, lists, and subcategories for fast skimming. If you're writing something that can't be put into a list, keep your paragraphs short.

Voice Searching

Have you ever seen commercials where people talk to a digital assistant like Google Home or Amazon Echo? Have you ever used your smartphone to ask Siri or Cortana for something? Voice searching has become a major contribution to how Google ranks websites.

There are three questions you need to keep in mind when it comes to voice searching. This will especially apply to the mobile-friendly version of your website:

- How will voice searching affect your website's user traffic?
- How can you deliver your content to make sure it comes up in a voice search?
- Does the content of your website use natural language?

Of course, you might be wondering what natural language even is.

Think about how you use the voice search app on your mobile device. You don't say “Movie times.” You say “What are the movie times for [insert movie here] at [local movie theater] today?” Voice search apps are like journalists. They use “who, what, where, why and how” questions to get results.

This doesn't mean that you should eliminate the usage of keywords. In fact, you'll need to look for longer keyword phrases. Also, keep the questions that your customers are asking in mind. Channel your inner Lois Lane and look for how to answer the “who, what, where, why and how” questions on your website and on social media. When it comes to content, make sure that you write like you were talking to a friend. Your users will feel like they're having a conversation with you and your website will be more likely to pop up in a voice search.

Think Local

Take advantage of what's needed in your local town or city. Say that you live in the Texas Hill Country and your town is famous for its antique stores, the

bluebonnets that grow every spring, and other seasonal events. When you make a website about your town, highlight what makes your town special all year round. Create a page that highlights the local old fashioned soda shop and artisan bakery. This way, you can promote and support local businesses.

Create a blog that talks about events happening in your town, like the latest community theater production or an art fair with works created by artists in your town and nearby neighborhoods. Link your website with keywords that are associated with your town's attractions and events. If you're really ambitious, write a book chronicling the history of your town and write about what makes your town special. Texas always supports writers who promote the state's culture and all the things that make Texas unique. See if you can use that in your local community.

User Experience Optimization

UEOs are a relatively new subcategory of SEOs, but the fact of the matter is that the two go hand in hand. After all, search engines rely on users. If you want to stay on top of your game and make the most of the UEOs, you need to

take user intent into account.

So what exactly are the goals of user intent?

1. Deliver an immediate and useful answer to the user
2. Bring the user to where they need to go most
3. Assist the user in completing a purchase or task.

What do you want your user to do once they arrive on your web page? What is the purpose of your web page and how can you make sure that users will make the most from it? Is your website there to inform users or sell products or a service to users? Why would a user need your website? Once you find the answer to those questions, you can manage the content of your site to make sure that the user gets the information they need right away and at the same time lead them to do whatever you want to get out of them in return.

You need to make sure the site is as efficient and as easy to navigate through as possible. It's all about a business's online perception/presence. Focus on the interaction between your product and the user. Make sure you use stock photos

or photos you've taken yourself, make sure that your text is clear and easy to read. Make sure your navigational buttons and links lead users to the right place.

At the same time, you need to make sure that your site still loads as quickly as possible, whether it's on a desktop computer or a mobile device. As stated before, slow loading times will lead to a decrease in your site's rankings. Worst case scenario, your site might be dropped entirely.

Consistent, Quality Content

Articles on SEO blogs conflict between small content and long content. The happy medium they can all agree with is having dense, rich, quality content that is put out on a consistent basis. This means that you don't have to add unnecessary information or use a million different keywords to your webpage in order to make sure that your website rises in the search engine rankings. It's enough nowadays to write short articles (say 300-500 words) that are straightforward and full of valuable information. You can still write longer posts, but make sure that there's a good mix of both long and short articles. What's most important, as always, is the quality of what you post.

Chapter 3: Ethical Guidelines

What Is The Purpose of Ethics?

Once upon a time, there was a corporation in a big city called Alpha Industries that makes its living trading commodities. It required all its employees to be graded on a scale of 1 to 10, with employees who score a 1 being marked for termination and employees who score a 10 were given a bonus. It was the most cutthroat, ruthless corporation in the whole city. In the eyes of Wall Street, Alpha Industries was a financial darling. What nobody realizes is that the trading company hid a dark secret.

Alpha Industries used their PR division to create an article about the latest trading news for a partner website. On the surface, it looked like a friendly collaboration. However, the company used the byline to create a link back to the company's website. The company also encouraged its interns to leave comments on business-related online forums and blog posts with links back to the site. Some of them even left links in the comments of YouTube videos that talked about the latest financial news.

Alpha Industries also included paid for links whenever they negotiated with their clients, article directories and blog networks, all designed solely for the purpose of building links. They built websites that linked to their trading partners and companies they sponsored. The PR department put out daily press releases to get links to the company in news websites.

These tactics are referred to in the industry as “black hat techniques.” These days, Google has an algorithm that tracks and penalizes sites that use these techniques. Companies like Alpha Industries would have their websites suspended from the search engines. Stick to what the industry calls “white hat techniques” and focus on creating content without oversaturating your website with SEOs and links.

The Customer Is Always Right

Whether your business is local or on the Fortune 500 list, a business's reputation with its customer base is basically everything.

A media corporation named KJ Enterprises took over a newspaper of a small town and completely changed the paper's content. The CEO of this media corporation, Kevin Johnson, released clickbait articles and lists that focused on celebrity gossip and scandals. When word got out that he fired the former owners and legacy employees, the townsfolk reacted by unsubscribing to the paper and staged a protest in support of the former newspaper owners and employees who were wrongfully terminated from the company.

You need to make sure that you have a good relationship with your customer base. Pay attention to the quality of your content and ask your viewers for feedback. You can’t force the people who visit your site to write a review, but you can create a page on your site that encourages your customer base to review your business and give you feedback. If your customer reviews are good quality, ask your customers if you can post their reviews on your website.

Avoid Copycats

Search engines usually discard web pages that have duplicate content. It's okay if you share your stuff multiple times on social media, but don't make a habit of it. And don't republish your articles on other websites.

If you're selling things on your website, make sure you have a variety of products. Don't just change the product name and image whenever you renew your inventory. Update your website with new information on your products and include customer reviews.

Avoiding duplicate content is a pretty simple step, but it helps to make sure your website is neat and tidy. It helps to have your website audited every year to make sure that you are being consistent in creating top-quality content.

Conclusion

Thank for making it through to the end of *SQL Mastery*, let's hope it was informative and able to present you with all of the tools you need to achieve your goals whatever it may be.

The next action is to take your newfound knowledge in SQL and put it to use in your job. If your current job does not use SQL, then you have made yourself more valuable to that company due to the fact that people who know programming languages are going to be able to do more than what they were hired to do!

Congratulations and good luck!

Finally, if you found this book useful in any way, a review on Amazon is always appreciated!

THANK YOU

Dear treasured reader, I would like to thank you from the bottom of my heart for choosing to purchase this book. I hope you've gotten some valuable information that you can use right now to build a successful online business for yourself. If you liked it, would you be so kind as to leave an honest/positive review for my book on amazon. I would appreciate it very much.

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Once again thank you and all the best to your success!
Jonathan S. Walker

About The Author

Hi there it's Jonathan Walker here, I want to share a little bit about myself so that we can get to know each other on a deeper level. I grew up in California, USA, and have lived there for the better part of my life. Being exposed to many different people and opportunities when I was young, it made me want to strive to become an entrepreneur to escape the rat race path that most of my peers had taken. I knew I wanted to be able to travel and experience the world the way it was meant to be seen and I've done just that. I've travelled to most places around the world and I'm enjoying every minute of it for sure. In my free time I love to play tennis and believe it or not, compose songs. I wish you all the best again in your endeavours, and may your dreams, whatever they may be, come true abundantly in the near future.