Data Cleaning In SQL Project

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2024-01-04

Introduction

This is a data cleaning SQL based project using the Nashville Housing dataset. This purpose of this project is to showcase my data cleaning skills in SQL. Although this report and code chuncks are viewed in anRMD formating, this project had been previously executed in Microsoft SQL Server Management Studio.

Installing Packages and Libraries for the purpose of this project, certain packages and libraries will be loaded to make R compatible with MSSQL databases connections. For this project, the DBI, odbc and RODBC packages will be installed and their subsequent packages loaded.

```
library(DBI)
library(odbc)
library(RODBC)
```

Connecting to the datbase Server a database connection will be established by creating a DSN connection to SQL_Server locally hosted on my desktop. This connection will be named con2

```
con2 <- dbConnect(odbc :: odbc(), "SQL_Server_DSN")</pre>
```

viewiing the table to be worked with using a basic SQL query, I will preview the data provided in the database

```
Select *
From [NashvilleHousing2]
```

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the next line of queries is to order the data by the land use type. The result is that the dataset is ordered by the land use type in alphabetical order.

```
Select *
From NashvilleHousing2
Order by LandUse
```

Table 2: Displaying records 1 - 10

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0	RISE	MAN	07		STRUC-	HER-	VICES			
309.0	OØBUILT	ST,			TION	MAN	DIS-			
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Changing the format of saledate in raw data from datetime format to date as time is not necessary in this data, also, the presence of time makes the data hard to read.

```
Select
SaleDate, CONVERT(date, SaleDate) as NewSaleDate
from NashvilleHousing2
```

Table 3: Displaying records 1 - 10

SaleDate	NewSaleDate
2016-09-20	2016-09-20
2015-01-16	2015-01-16
2014-11-01	2014-11-01
2013-09-12	2013-09-12
2013-11-22	2013-11-22
2014-01-22	2014-01-22
2014-08-28	2014-08-28
2016-09-09	2016-09-09
2015 - 10 - 26	2015-10-26
2016-04-27	2016 - 04 - 27

We see the result of the query as two columns containing the NewSaleDate column the NashvilleHousing2 dataset will then be updated with theupdate' function

```
Update NashvilleHousing2
Set SaleDate = CONVERT(Date, SaleDate)
```

a new column named SaleDateConverted is also added to allow for readability of the data

```
Alter Table NashvilleHousing2
Add SaleDateConverted Date;
```

the table will then be updated with the code chunk below and we can view the update of the table with the subsequent code chunk.

```
Update NashvilleHousing2
Set SaleDateConverted = Convert(date, SaleDate)

Select *
From NashvilleHousing2
```

Table 4: Displaying records 1 - 10

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		BRENT]-		LEANN	BRENT-	TRICT			
		WOOD			KAY	WOOD,				
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339 0 71 02 0 013.0	ILY	OAKE OAKE DR, BREN WOOL	ES11- 01 IT-	500 20 141Nb0 0103531	- CARINI KEVIN F.		1_	SURB SER- VICH DIS- TRIC	ES	O O 807	(XX 70	0 09 8	43	2	0	2014- 11- 01
02 0A 002.0	CONI	OENTI OWILLA VIEW CT, BREN WOO!	A 09- 12 IT-	990 20 130 N 16 0097186	- NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2013- 09- 12
419171 02 0A 003.0	CONI	O 0 05 VILLA VIEW CT, BREN WOO	A 11- 7 22 IT-	050 20 131 2 166 0126781	- NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2013- 11- 22
40 5 71 02 0A 008.0	CONI	OQ5 VILLA VIEW CT, BREN WOOD	A 01- 22 IT-	50 20 140 1\2 7 0007078	- NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2014- 01- 22
12 9 71 02 0A 011.0	CONI	OEMTI OVILLA VIEW CT, BREN WOO	A 08- 28	000 20 140 3 764 0080767	- NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2014- 08- 28
92 3 71 02 0A 011.0	CONI	OKMTI OVILLA VIEW CT, BREN WOO	A 09- 7 09 IT-	50 20 160 N t5 0096930	- NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2016- 09- 09
894 5 71 02 0A 014.0	CONI	OENTI OVILLA VIEW CT, BREN WOO!	A 10- 7 26 IT-	200 20 151 N2 9 0110208	- NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2015- 10- 26

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The table has been confirmed updated with the neccesary column.

Next, I will like to see what datapoints have nulls in them and how they can be fixed.

```
Select *
From NashvilleHousing2
Where PropertyAddress is null
```

Table 5: Displaying records 1 - 10

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				RAH							
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$5314 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	RESIDENT	` 12401 L6144′	9 20 160 8 3:1-	NA	NA	NA NA	NA NA	NA NA NA	NA	NA	2016-
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0	1-)(DEN-	04													04
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29 rows of data where found where the property address is null.

In ordr to figure out if the null data stemmed from simple ommisions, I use a join statement to check for identical parcelIDs and join them.

```
Select a.ParcelID, a.PropertyAddress, b.ParcelID, b.PropertyAddress
From Portfolio_Project..NashvilleHousing2 a
Join Portfolio_Project..NashvilleHousing2 b
On a.ParcelID = b.ParcelID
   And a.[UniqueID] <> b.[UniqueID]
   Where a.PropertyAddress is null
```

Table 6: Displaying records 1 - 10

ParcelID	PropertyAddress	ParcelID	PropertyAddress	
025 07 0 031.00	NA	$025\ 07\ 0\ 031.00$	410 ROSEHILL CT,	
	27.4		GOODLETTSVILLE	
026 01 0 069.00	NA	026 01 0 069.00	,	
026 01 0 069.00	NA	026 01 0 069.00	141 TWO MILE PIKE, GOODLETTSVILLE	

ParcelID	PropertyAddress	ParcelID	PropertyAddress
026 05 0 017.00	NA	$026\ 05\ 0\ 017.00$	208 EAST AVE, GOODLETTSVILLE
$026\ 06\ 0A\ 038.00$	NA	$026\ 06\ 0A\ 038.00$	109 CANTON CT,
			GOODLETTSVILLE
$033\ 06\ 0\ 041.00$	NA	$033\ 06\ 0\ 041.00$	1129 CAMPBELL RD,
			GOODLETTSVILLE
033 06 0A 002.00	NA	$033\ 06\ 0A\ 002.00$	1116 CAMPBELL RD,
			GOODLETTSVILLE
$033\ 15\ 0\ 123.00$	NA	$033\ 15\ 0\ 123.00$	438 W CAMPBELL RD,
			GOODLETTSVILLE
$034\ 03\ 0\ 059.00$	NA	$034\ 03\ 0\ 059.00$	2117 PAULA DR, MADISON
$034\ 03\ 0\ 059.00$	NA	$034\ 03\ 0\ 059.00$	2117 PAULA DR, MADISON
$034\ 07\ 0B\ 015.00$	NA	$034\ 07\ 0B\ 015.00$	2524 VAL MARIE DR, MADISON

The result is a table where property addresses have been parsed based on the parcel IDs found for properties in the dataset.

```
Select a.ParcelID, a.PropertyAddress, b.ParcelID, b.PropertyAddress, ISNULL(a.PropertyAddress, b.Proper
From Portfolio_Project..NashvilleHousing2 a
Join Portfolio_Project..NashvilleHousing2 b
On a.ParcelID = b.ParcelID
    And a.[UniqueID] <> b.[UniqueID]
    Where a.PropertyAddress is null
```

Table 7: Displaying records 1 - 10

ParcelID	Property	AddresParcelID	${\bf PropertyAddress}$	
025 07 0	NA	025 07 0	410 ROSEHILL CT,	410 ROSEHILL CT,
031.00		031.00	GOODLETTSVILLE	GOODLETTSVILLE
$026\ 01\ 0$	NA	$026\ 01\ 0$	141 TWO MILE PIKE,	141 TWO MILE PIKE,
069.00		069.00	GOODLETTSVILLE	GOODLETTSVILLE
$026\ 05\ 0$	NA	$026\ 05\ 0$	208 EAST AVE,	208 EAST AVE,
017.00		017.00	GOODLETTSVILLE	GOODLETTSVILLE
$026\ 06\ 0\mathrm{A}$	NA	$026\ 06\ 0A$	109 CANTON CT,	109 CANTON CT,
038.00		038.00	GOODLETTSVILLE	GOODLETTSVILLE
$033\ 06\ 0$	NA	$033\ 06\ 0$	1129 CAMPBELL RD,	1129 CAMPBELL RD,
041.00		041.00	GOODLETTSVILLE	GOODLETTSVILLE
$033\ 06\ 0\mathrm{A}$	NA	$033\ 06\ 0A$	1116 CAMPBELL RD,	1116 CAMPBELL RD,
002.00		002.00	GOODLETTSVILLE	GOODLETTSVILLE
$033\ 15\ 0$	NA	$033\ 15\ 0$	438 W CAMPBELL RD,	438 W CAMPBELL RD,
123.00		123.00	GOODLETTSVILLE	GOODLETTSVILLE
$034\ 03\ 0$	NA	$034\ 03\ 0$	2117 PAULA DR,	2117 PAULA DR,
059.00		059.00	MADISON	MADISON
$034\ 03\ 0$	NA	$034\ 03\ 0$	2117 PAULA DR,	2117 PAULA DR,
059.00		059.00	MADISON	MADISON
$034~07~0\mathrm{B}$	NA	$034~07~0\mathrm{B}$	2524 VAL MARIE DR,	2524 VAL MARIE DR,
015.00		015.00	MADISON	MADISON

with the below code chunk, the dataset will be updated using the datapoints gotten using the unique ID

```
Update a
Set PropertyAddress = ISNULL(a.PropertyAddress, b.PropertyAddress)
From Portfolio_Project..NashvilleHousing2 a
Join Portfolio_Project..NashvilleHousing2 b
    On a.ParcelID = b.ParcelID
    and a.[UniqueID] <> b.[UniqueID]
    WHEre a.PropertyAddress is null
```

I will then check to confirm the dataset has been cleaned

```
Select *
    From NashvilleHousing2
    Where PropertyAddress is null
```

Table 8: 0 records

all null datapoints have been corrected for the property address.

Up next, I will break the property id into seperate columns for readability

```
Select PropertyAddress
From NashvilleHousing2
```

Table 9: Displaying records 1 - 10

PropertyAddress 5900 CLOVERLAND DR, BRENTWOOD CLOVERLAND DR, BRENTWOOD 5672 OAKES DR, BRENTWOOD 103 VILLA VIEW CT, BRENTWOOD 105 VILLA VIEW CT, BRENTWOOD 115 VILLA VIEW CT, BRENTWOOD 104 VILLA VIEW CT, BRENTWOOD 104 VILLA VIEW CT, BRENTWOOD 110 VILLA VIEW CT, BRENTWOOD 110 VILLA VIEW CT, BRENTWOOD 118 VILLA VIEW CT, BRENTWOOD

I will seperate the address into seperate columns using the comma seperator in the CHARINDEX function

```
Select
SUBSTRING (PropertyAddress, 1, CHARINDEX(',', PropertyAddress)) as Address
From NashvilleHousing2
```

Table 10: Displaying records 1 - 10

Address
5900 CLOVERLAND DR
CLOVERLAND DR,
5672 OAKES DR,
103 VILLA VIEW CT,
105 VILLA VIEW CT,
115 VILLA VIEW CT,
104 VILLA VIEW CT,
104 VILLA VIEW CT,
110 VILLA VIEW CT,
118 VILLA VIEW CT,

the above chunk splits just the first part of the address line the next code chunk will split the address line by two places

```
Select
SUBSTRING (PropertyAddress, 1, CHARINDEX(',', PropertyAddress)-1) as Address,
Substring (PropertyAddress, CharIndex(',', PropertyAddress) + 1, Len(PropertyAddress)) as Address
From NashvilleHousing2
```

Table 11: Displaying records 1 - 10

Address	Address
5900 CLOVERLAND DR	BRENTWOOD
CLOVERLAND DR	BRENTWOOD
5672 OAKES DR	BRENTWOOD
103 VILLA VIEW CT	BRENTWOOD
105 VILLA VIEW CT	BRENTWOOD
115 VILLA VIEW CT	BRENTWOOD
104 VILLA VIEW CT	BRENTWOOD
104 VILLA VIEW CT	BRENTWOOD
110 VILLA VIEW CT	BRENTWOOD
118 VILLA VIEW CT	BRENTWOOD

I will then update the table with the next code chunks nvarchar specifies the formatting of the data in the column that is being created.

```
Alter Table NashvilleHousing2
Add PropertySplitAddress nvarchar(225);

Update NashvilleHousing2
Set PropertySplitAddress = SUBSTRING (PropertyAddress, 1, CHARINDEX(',', PropertyAddress)-1)

Alter Table NashvilleHousing2
Add PropertyCity nvarchar(225);
```

```
Update NashvilleHousing2
```

Set PropertyCity = Substring (PropertyAddress, CharIndex(',', PropertyAddress) + 1, Len(PropertyAddress

Select *

From NashvilleHousing

Table 12: Displaying records 1 - 10

Uniq Ref E	èШandSaskePerigælBofd	r ChVn eaNtaAcedagacBlailddog MWadaBe	allifooli	h B etl	fi B altelD₽t	teperkesp	ki data da
2045007	SING 214E 0 20 130 2 162-	FRAZIE B ,305000 0 682 03 57 09 863	3	0	2013- 18	808 GOC	DENOET GENOIDE TTSVILLE
00	FAM- 0036474						FOX
0	ILY	THA			09 C	CHASE	CHASE
125.0		LYNETTE			D	$^{ m R}$	DR
1691807	SING 1616 0 20 14 0 15 16 9-	BONER, 3.505000 2 641 331 90 09 983	3	2	2014- 18	832 GOC	DBBETGSWIDDETTSVILLE
00	FAM- 0053768	CHARLES			06- F	'OX	FOX
0	ILY	&			10 C	CHASE	CHASE
130.0	00	LESLIE			D	$^{ m OR}$	DR
5458 2 07	SING 4315 0 20 160 9 257-	WILSON2.905000 2 162 229 80 09 874	3	0	2016- 18	864 GOC	DX6#TG\$XXIDDETTSVILLE
00	FAM- 0101718	JAMES			09- F	'OX	FOX
0	ILY	E. &			26 C	CHASE	CHASE
138.0		JOANNE					DR
4307 0 07	SING 25E 0 20 160 N 29-	BAKER, 2.605000047300973009853	3	0			D85BTGSXXIDINETTSVILLE
00	FAM- 0008913	JAY			01- F	'OX	FOX
0	ILY	K. &			29 C	CHASE	CHASE
143.0	00	SU-			D	$^{ m R}$	DR
		SAN					
		E.					
2271@07	SING 278 0 20 141 0 165-	POST, 2.00500005230202309844	3	0			D82ETGSXIDDETTSVILLE
00	FAM- 0095255	CHRISTO-					FOX
0	ILY	PHER					CHASE
149.0	00	M. &			D	$^{ m DR}$	DR
		SAMAN-					
		THA					
		C.					
1836707		FIELDS, 2.00500009040259800803	3	0			DEPET GOVERNMENT TSVILLE
00	FAM- 0063802	KAREN					FOX
0	ILY	L. &					CHASE
151.0	00	BRENT			D	$^{ m PR}$	DR
		A.					
		HINTON1.03400003790077909763	2	0			2006TGSXIDDETTSVILLE
14	FAM- 0080214	MICHAEL					SADIE
0	ILY	R. &			28 L	ıΝ	LN
002.0	00	CYN-					
		THIA					
		M.					
D 102	OTT TOTAL CONTRACT OF THE CONT	MOORE	_			~	
		BAILOR,1.03400005790097900783	2	0			DRIETGSWIDDETTSVILLE
14	FAM- 0105441	DAR-					GRACE-
0	ILY	RELL					LAND
024.0	JU	&			D)R	DR

TAMMY

UniqReft	èП£Dnd¶Sasl	e Erigel Bofd	r æstva eaNt	aAmedagaeBkildifiq	t W aveada B eeri		n B etll	i B altelE	Preperk	yospeki	DtArd ElitgArdsolveds	AsaphitAs Clite	ssSta
3650 0 07	SING 18E	50 20 150 8 1b9-	ROBER	LIS674540 0 7690 22 2	23 00 003	2	1	2015-	1428 C	OOI	ALET GSXXII	_ DETTSVII	LLE
14	FAM-	0083440	MISTY					08-	SPRING	G-S	SPRING-		
0	ILY		L. &					14	FIELD	F	FIELD		
026.0	00		ROBER	Γ					HWY	I	HWY		
			M.										
1980 5 07	SING14F	0 20 140 9 09-	LEE,	1.304000079602019	96 09 955	3	0	2014-	1420 C	500I	ALETESMII	INE TTSVII	LLE
14	FAM-	0082348	JEF-					08-	SPRING	G-S	SPRING-		
0	ILY		FREY					29	FIELD	F	FIELD		
034.0	00		&						HWY	F	ΉWY		
			NANCY										

The same operation that was performed with property address above will also be performed on the owner address, but with the PARSENAME function.

```
Select OwnerAddress
From NashvilleHousing2
```

Table 13: Displaying records 1 - 10

OwnerAddress
5900 CLOVERLAND DR, BRENTWOOD, TN 0 CLOVERLAND DR, BRENTWOOD, TN 5672 OAKES DR, BRENTWOOD, TN NA NA NA NA
NA
NA
NA

```
Select
PARSENAME(Replace(OwnerAddress, ',', '.'), 3),
PARSENAME(Replace(OwnerAddress, ',', '.'), 2),
PARSENAME(Replace(OwnerAddress, ',', '.'), 1)
From NashvilleHousing2
```

Table 14: Displaying records 1 - 10

5900 CLOVERLAND DR	BRENTWOOD	TN
0 CLOVERLAND DR	BRENTWOOD	TN
5672 OAKES DR	BRENTWOOD	TN
NA	NA	NA

```
NA NA NA
```

Now that the effect of the above functions is known, the table will then be updated

```
Alter Table NashvilleHousing2
Add OwnerAddressSplit nvarchar(225);

Update NashvilleHousing2
Set OwnerAddressSplit = PARSENAME(Replace(OwnerAddress, ',', '.'), 3)

Alter Table NashvilleHousing2
Add OwnerAddressCity nvarchar(225);

Update NashvilleHousing2
Set OwnerAddressCity = PARSENAME(Replace(OwnerAddress, ',', '.'), 2)

Alter Table NashvilleHousing2
Add OwnerAddressState nvarchar(225);

Update NashvilleHousing2
Set OwnerAddressState = PARSENAME(Replace(OwnerAddress, ',', '.'), 1)

Select *
From NashvilleHousing
```

Table 15: Displaying records 1 - $10\,$

Uniquate	æП£Dnd S (s	ke Exigel Rofd	ActivaeaNtaAccdagacB(alldTogANValuB	erilhTool	hBet	HadlifBalletD Pruceperity of polithy delity And in the Salah das delityses Sta
2045007	SING14	30 20 1301112-	FRAZIE B ,305000 0 682 03 57 09 863	3	0	2013-1808 GOODNOETCSWOIDINETTSVILLE
00	FAM-	0036474	CYREN-			04- FOX FOX
0	ILY		THA			09 CHASE CHASE
125.0	00		LYNETTE			DR DR
1691 8 07	SING 6	30 20 14081b9-	BONER, 3.505000 2 6410 20 190 09 983	3	2	2 2014-1832 GOODSBETGSWIDDETTSVILLE
00	FAM-	0053768	CHARLES			06- FOX FOX
0	ILY		&			10 CHASE CHASE
130.0	00		LESLIE			DR DR
5458 2 07	SING	50 20 160 9 27-	WILSON2.905000 2 162 029 80 09 874	3	0	2016-1864 GOODMETTSVILLE
00	FAM-	0101718	JAMES			09- FOX FOX
0	ILY		E. &			26 CHASE CHASE
138.0	00		JOANNE			DR DR
4307 0 07	SING 15	50 20 160 N 29-	BAKER, 2.605000047300973009853	3	0	2016-1853 GOODSETGSWIDDETTSVILLE
00	FAM-	0008913	JAY			01- FOX FOX
0	ILY		K. &			29 CHASE CHASE
143.0	00		SU-			DR DR
			SAN			
			E.			

Uniquett	Mand State Prigal Bofe	hÆstva en Nta Arredaga eBlaildærg v Mentu Br	dhEod	hBster	dli B alldDPucQ orRysipidityddityddingsydphicAsdit yssState
2271@07	FAM- 0095255	- POST, 2.0050000523002300844 CHRISTO-	3	0	2014-1829 GOODETTGSVOIDETTSVILLE 10- FOX FOX
0 149.0		PHER M. & SAMAN- THA C.			10 CHASE CHASE DR DR
1836 7 07 00 0 151.0	FAM- 0063802 ILY	- FIELDS, 2.00500009040359800803 KAREN L. & BRENT A.	3	0	2014-1821 GOODERTGSWOIDETTSVILLE 07- FOX FOX 16 CHASE CHASE DR DR
1980407 14 0 002.0	FAM- 0080214 ILY	- HINTON].03400003790077900763 MICHAEL R. & CYN- THIA M. MOORE	2	0	2014-2005 GOO DUDET GSWIDDNE TTSVILLE 08- SADIE SADIE 28 LN LN
5458 3 07 14 0 024.0	FAM- 0105441 ILY	- BAILOR,1.034000 0 5790 0 979 0 9783 DAR- RELL & TAMMY	2	0	2016-1917 GOO DMETGSWIDDE TTSVILLE 09- GRACE- GRACE- 27 LAND LAND DR DR
3650 0 07 14 0 026.0	FAM- 0083440 ILY	- ROBERTS6745400769022300003 MISTY L. & ROBERT M.	2	1	2015-1428 GOO DEETGSWIDDE TTSVILLE 08- SPRING- SPRING- 14 FIELD FIELD HWY HWY
1980 5 07 14 0 034.0	FAM- 0082348 ILY		3	0	2014-1420 GOO DEETGSWIDDE TTSVILLE 08- SPRING- SPRING- 29 FIELD FIELD HWY HWY

Investigating the Data further, I found in the SoldAsVacant column some entries are in the forms yes, no, Y and N, to not skew the data, or have errors, I changed them to a consistent form Yes and No

Select Distinct (SoldAsVacant), Count(SoldAsVacant)
From NashvilleHousing2
Group by SoldAsVacant
Order by 2

Table 16: 4 records

SoldAsVacant	
Y	52
N	399
Yes	4623
No	51403

Table 17: Displaying records 1 - 10

SoldAsVacant					
No	No				
Yes	Yes				
No	No				
No	No				
No	No				
No	No				
No	No				
No	No				
No	No				
No	No				

```
Update
NashvilleHousing2
Set SoldAsVacant = Case WHEN SoldAsVacant = 'Y' Then 'Yes'
    when SoldAsVacant = 'N' then 'No'
    Else SoldAsVacant
    END
```

The table has been updated with the corrections that were needed.

Next up I will be removing duplicates within the dataset and creating a Common Table Expression CTE

```
With RowNumCTE As(
Select *,
    ROW_NUMBER () Over (
    Partition By ParcelID,
                PropertyAddress,
                SalePrice,
                SaleDate,
                LegalReference
                Order by
                    UniqueID) row_num
From
NashvilleHousing2
--Order by ParcelID
)
Select *
from RowNumCTE
Where row_num > 1
Order by PropertyAddress
```

UniqaartDHDPtisope8tal 455kildBeges BleK OwViscoNinte m4Add Tagas Distm BW illTiotgM shill	e el Fload III	BalfBaldBaop@myQmhydVilgHesAnkGylkkbDiis sState
273547 SINCIDES 2015/00/2015/N2/19GREEN/N3 0.22URBA/N/06/46/8/160/942 14 FAMBRI- 02- 0014347 KASBRI- SER-	2 0	20154003 NAS HO3INASHWI2 LE 02- BRI- BRI-
0 ILY LEY 12 SANLEY VICES		12 LEY LEY
157.00 PKWY, DRAPKWY, DIS-		PKWY PKWY
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04 FAMES- 02- 0013547 STUES- SER-	3 (02- ES- ES-
0 ILY TUR-13 TUR- VICES		13 TUR- TUR-
144.00 BRIDGE BRIDGEDIS-		BRIDGEBRIDGE
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TN	0 0	OO 1 E 1 OO C N. A. CHETA PANITA TOTANILLAN I. I.
273629 DUPIOEOX 2015/0002015N2015POSTQ06 0.99URBAANS 1807501018 19058 16 DRUM 2- 0014086 KEVIDRUM- SER-	3 (02- DRUM- DRUM-
0 MOND7 MOND VICES		17 MOND MOND
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TN		
271 329 1 SINGADE 20155992 20 15N227MENIDING0.17URB 200 9406061600943	2 (20154011 NASHMINASHVILLE
08 FAM43RD 02- 0017102 HEA43RSD SER-		02- 43RD 43RD
0 ILY AVE 23 INC.AVE VICES		23 AVE AVE
056.00 N, N, DIS-		N N
NASHVILLE NASHVI LIRI CT		
TN 73 68 5 RES IDEN 2014-1 8 28 01 502-100A NA NANA NANA NANANAN	TANAN	JA 20151023 NJA SNEWIJINIA ENJA - 2
10 CONDAP-02- 0012380	IAIIAI	02- CAP-
0E I- 06		06 I-
020.00 TAL		TAL
FUNDS		FUNDS
CT,		CT
NASHVILLE		
273695 RESIDEN 2014 E1892015 N2010 NA NANA NANA NANA NANA NANA NA		
10 CONDAP-02- 0012389		02- CAP-
0E I- 06		06 I-
021.00 TAL FUNDS		TAL
CT,		FUNDS CT
NASHVILLE		O1
271 29 1 SING 038 20154002015N227DAVIS38 0.14URB2000830000309047	1 (20154038 NAS H38INASHVIL LE
04 FAM40TH 02- 0016978 CRY\$9TH SER-		02- 40TH 40TH
0 ILY AVE 23 TALAVE VICES		23 AVE AVE
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           10 CONDAON-02-
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           014.00 WAY,
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                                       NASHVILLE
06 CONTHUCE2-
                                                                                 0017053
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                                       ADEE26
                                                                                                                                                                                                                                                                         CIR
           137.00
                                     CIR,
                                       HER-
                                       MITAGE
```

```
With RowNumCTE As(
Select *,
    ROW_NUMBER () Over (
    Partition By ParcelID,
                PropertyAddress,
                SalePrice,
                SaleDate,
                LegalReference
                Order by
                    UniqueID) row_num
From
NashvilleHousing2
--Order by ParcelID
DELETE
from RowNumCTE
Where row_num > 1
```

Finally as part of the data cleaning, unwanted columns will be removed from the table such as OwnerName to anonymize the data and protect privacy of owners, and the OwnerAddress and OwnerAddressCity

```
Select *
From NashvilleHousing2
```

Unidar FEND 1 Prope Stale Fald berick Flat Constitution of the Con 5392271 SINCTONO 20163000006N000CHANGOO 1.10URB 222054017781938 1 0 20165900 BRESION BREING WOOD 00 FAMCLOVODR- 0106043 MATTOLIECOWERSER-09- CLOVERGLOVER-ILY LAND20 RAY LAND VICES 20 LAND LAND 152.00 DIS-DR. DR. DRDRBRENT-LEANIBRENT- TRICT WOOD KAY WOOD, TN& ETAL2577871 VACACINO V2101R300000001 507620NA 0.93URB**A29**00 4290**0**A NA 0 0 2015CLO**BRENATNEDENN** WOOD 00 RES-DR, 01-0005484 CLOVERSER-01- DR CLOVER-BRENT6-LAND VICES LAND 16 202.00EN-WOOD DRDR. DIS-TIAL BRENT- TRICT LAND WOOD. TN2339071 SINCH672 2014250000014Nbb0CARIN5672 1.36URB46830807212700984 2 0 201425672BRE5N72VR7ENNTWOOD 0103531 KEVINOAKES SER-02 FAMOAKES-11- OAKES OAKES ILY DR, 01 DR. VICES 01 DR DRF. BRENT- DIS-013.00 BRENT-WOOD, TRICT WOOD TNNA NANA NANA NANANANA 2013 103 BREWAT WAYONA 7586.71 RESIDOEN **ZDA3L**69020013N0016NA 02 CONDOLLA9-0097186 09- VILLA 0AVIEW12 12 VIEW 002.00 CTCT, BRENT-WOOD 941971 CONDO 2013-95020013N216NA NA NANA NANANANANANA 2013 405 BREWAT WAYONA 02 VILLA1-0126781 11- VILLA 0AVIEW22 22 VIEW CT003.00 CT, BRENT-WOOD 1140571 CONDO 2014-650200 4Nt27NA NA NANA NANANANANANA 2014415 BRENAT WAY ODA VILLA1-01- VILLA 02 0007078 0AVIEW22 22 VIEW 008.00 CT, CTBRENT-WOOD 191**29**1 RESIDOEN **ZDA4L**90**200**14**N9**04NA NA NANA NANANANANANA 2014-104 BREWAT WAYONA 02 CON**VO**LL**A**8-0080767 08- VILLA 0A28 VIEW VIEW28 011.00 CT. CTBRENT-WOOD

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539 23 71 RESIDNEN ZDAG 255 200 0 6 N 3015N A	NA	NANA NANANANANANA2016104 BREWATWOODA
02 CON NO LL A 9- 0096930		09- VILLA
0A VIEW09		09 VIEW
011.00 CT,		CT
BRENT-		
WOOD		
389 4 51 RESID E N ZDA2 20 200 5 N 02 9 NA	NA	NANA NANANANANA2015410 BREWATWOODA
02 CON NO LLA0- 0110208		10- VILLA
0A VIEW26		26 VIEW
014.00 CT,		CT
BRENT-		
WOOD		
461971 RESIDEN ZDA (2325200 6N506NA	NA	NANA NANANANANANA2016418 BREWATWOODA
02 CON NO LL A 4- 0045160		04- VILLA
0A VIEW27		27 VIEW
018.00 CT,		CT
BRENT-		
WOOD		

ALTER TABle

NashvilleHousing2

drop column OwnerAddress, OwnerName, OwnerAddressCity, OwnerAddressSplit

I have now come to the end of the operation, and the cleaned data can then be viewed with the code chunk below

Select *

From NashvilleHousing2

Table 20: Displaying records 1 - 10

Uniq Ref E	eII Dand U	J P eropert	tySAlddBase	a Parige l Rofe	r Andre Egn Diskrin	tB/aildFog&Weald&	exilitizati	h iB tet!	lli BaldDRucGerRySpOltAGalAs dressState
5392 2 71	SING	L 5 2900	2016300	0 20 161 0 06-	1.10URBA 8 220	095400177809313	1	0	2016-5900 BRE N TNWOOD
00	FAM-	CLOVE	E 189 -	0106043	SER-				09- CLOVER-
0	ILY	LAND	20		VICES				20 LAND
152.0	00	DR,			DIS-				DR
		BREN	Γ-		TRICT				
		WOOD)						
2577\$71	VACA	MTOVE	E P C11 A9010	0 2 0150 Y20 -	0.93URBA M 290	000 4290 N A N	A 0	0	2015- CLOV BRENIN WOOD
00	RES-	DR,	01-	0005484	SER-				01- DR
0	I-	BREN	Γ 16		VICES				16
202.0)DEN-	WOOD)		DIS-				
	TIAL				TRICT				
	LAND)							
2339071	SING	L 5 672	2014250	0 20 141 N k0-	1.36URBA M 630	0 0 807 022 70 09 843	2	0	2014-5672 BRE N'I NWOOD
02	FAM-	OAKES	S11-	0103531	SER-				11- OAKES
0	ILY	DR,	01		VICES				01 DR
013.0	00	BREN	Γ-		DIS-				
		WOOD)		TRICT				

UniqRefE	ellandU&copert SalkWateP.rige lBefdr AnVelige l	aDis LzintB/killdfog\/NYadrBexillf0olldBkillfBalk DdPucG orRy&pfdtdAffitdeds lressState
7586171 02 0A	COND Ø ILLA 09- VIEW 12 0097186	NA NA NA NA NA NA NA 2013- 103 BRE NT WOOD 09- VILLA 12 VIEW
002.0	BRENT- WOOD	CT
9419171 02 0A 003.0	COND 0 05 20134950 20 131 2 16- NA NA VILLA 11- 0126781 VIEW 22 00 CT, BRENT- WOOD	NA NA NA NA NA NA NA 2013- 105 BRE NT WOOD 11- VILLA 22 VIEW CT
1140 \$ 71 02 0A 008.0	COND Q 15 20141650 20 140 N 27- NA NA VILLA 01- 0007078 VIEW 22 00 CT, BRENT- WOOD	NA NA NA NA NA NA NA 2014-115 BRE N AWOOD 01- VILLA 22 VIEW CT
1912 9 71 02 0A 011.0	RESID EN TIA E 0141900 20 140 3064 - NA NA COND Ø ILLA 08- 0080767 VIEW 28	NA NA NA NA NA NA NA 2014- 104 BRE NT WOOD 08- VILLA 28 VIEW CT
5392 3 71 02 0A 011.0	RESIDENTIAE0162550201602016- NA NA CONDUILLA 09- 0096930 VIEW 09 00 CT, BRENT- WOOD	NA NA NA NA NA NA NA 2016- 104 BRE N AWOOD 09- VILLA 09 VIEW CT
3894 5 71 02 0A 014.0	RESIDENTIAE015220020151829- NA NA CONDUILLA 10- 0110208 VIEW 26 0 CT, BRENT- WOOD	NA NA NA NA NA NA NA 2015- 110 BRE N AWOOD 10- VILLA 26 VIEW CT
4619 T 71 02 0A 018.0	COND Ø ILLA 04- 0045160 VIEW 27	NA NA NA NA NA NA NA 2016-118 BRE N AWOOD 04- VILLA 27 VIEW CT