CRUD and Data Changing Operations

🎯 Session Objectives:

- ✅ Limit results using LIMIT & OFFSET 🎯
- ✅ Add comments for better documentation 📝
- ✅ Use column aliases for readability 🏷️
- ✅ Perform Create, Read, Update, and Delete (CRUD) operations
- ✅ Handle EMPTY vs NULL values properly
- ✅ Use TRUNCATE and DROP commands efficiently
- ✅ Understand differences between DELETE, TRUNCATE, and DROP

LIMIT/OFFSET → Skips the Number of records mention in Offset

Order BY -> Top 10 records / Bottom 10 Records

Find the Top 10 Products based on their Product Price

```
SELECT
    ProductName,
    ModelName,
    ProductColor,
    ProductPrice
FROM Products
ORDER BY ProductPrice DESC -- Top to Bottom
LIMIT 10;
```

ProductName	ModelName	ProductColor	ProductPrice
Road-150 Red, 62	Road-150	Red	3578.27
Road-150 Red, 44	Road-150	Red	3578.27
Road-150 Red, 48	Road-150	Red	3578.27
Road-150 Red, 52	Road-150	Red	3578.27
Road-150 Red, 56	Road-150	Red	3578.27
Mountain-100 Silver, 48	Mountain-100	Silver	3399.99
Mountain-100 Silver, 44	Mountain-100	Silver	3399.99
Mountain-100 Silver, 42	Mountain-100	Silver	3399.99
Mountain-100 Silver, 38	Mountain-100	Silver	3399.99
Mountain-100 Black, 48	Mountain-100	Black	3374.99

Find the Bottom 15 Products based on their Product Cost

```
SELECT
    ProductName,
    ModelName,
    ProductColor,
    ProductCost
FROM Products
ORDER BY ProductCost -- By Default Ascending [Low to High]
LIMIT 15;
```

ProductName	ModelName	ProductColor	ProductCost
Patch Kit/8 Patches	Patch kit	NA	0.8565
Road Tire Tube	Road Tire Tube	NA	1.4923
Water Bottle - 30 oz.	Water Bottle	NA	1.8663
Touring Tire Tube	Touring Tire Tube	NA	1.8663
Mountain Tire Tube	Mountain Tire Tube	NA	1.8663
Bike Wash - Dissolver	Bike Wash	NA	2.9733
Road Bottle Cage	Road Bottle Cage	NA	3.3623
Racing Socks, L	Racing Socks	White	3.3623
Racing Socks, M	Racing Socks	White	3.3623
Mountain Bike Socks, M	Mountain Bike Socks	White	3.3963
Mountain Bike Socks, L	Mountain Bike Socks	White	3.3963
Mountain Bottle Cage	Mountain Bottle Cage	NA	3.7363
AWC Logo Cap	Cycling Cap	Multi	5.7052
Taillights - Battery-Po...	Taillight	NA	5.7709
LL Road Tire	LL Road Tire	NA	8.0373

Find the Top Products [11-20] based on their Product Price

Skips the First Top 10 Products and then fetch the next top 10 products [11-20]

```
SELECT
    ProductName,
    ModelName,
    ProductColor,
    ProductPrice
FROM Products
ORDER BY ProductPrice DESC -- Top to Bottom
LIMIT 10
OFFSET 10; -- Skips First 10 records
```

ProductName	ModelName	ProductColor	ProductPrice
Road-150 Red, 62	Road-150	Red	3578.27
Road-150 Red, 44	Road-150	Red	3578.27
Road-150 Red, 48	Road-150	Red	3578.27
Road-150 Red, 52	Road-150	Red	3578.27
Road-150 Red, 56	Road-150	Red	3578.27
Mountain-100 Silver, 48	Mountain-100	Silver	3399.99
Mountain-100 Silver, 44	Mountain-100	Silver	3399.99
Mountain-100 Silver, 42	Mountain-100	Silver	3399.99
Mountain-100 Silver, 38	Mountain-100	Silver	3399.99
Mountain-100 Black, 48	Mountain-100	Black	3374.99
Mountain-100 Black, 38	Mountain-100	Black	3374.99
Mountain-100 Black, 42	Mountain-100	Black	3374.99
Mountain-100 Black, 44	Mountain-100	Black	3374.99
Road-250 Red, 48	Road-250	Red	2443.35
Road-250 Red, 44	Road-250	Red	2443.35
Road-250 Red, 52	Road-250	Red	2443.35
Touring-1000 Yellow, 60	Touring-1000	Yellow	2384.07
Touring-1000 Yellow, 50	Touring-1000	Yellow	2384.07
Touring-1000 Yellow, 46	Touring-1000	Yellow	2384.07
Touring-1000 Yellow, 54	Touring-1000	Yellow	2384.07

Top 10 Records

Next Top 10 Records
[11-20]

ProductName	ModelName	ProductColor	ProductPrice
Mountain-100 Black, 38	Mountain-100	Black	3374.99
Mountain-100 Black, 42	Mountain-100	Black	3374.99
Mountain-100 Black, 44	Mountain-100	Black	3374.99
Road-250 Red, 48	Road-250	Red	2443.35
Road-250 Red, 44	Road-250	Red	2443.35
Road-250 Red, 52	Road-250	Red	2443.35
Touring-1000 Yellow, 60	Touring-1000	Yellow	2384.07
Touring-1000 Yellow, 50	Touring-1000	Yellow	2384.07
Touring-1000 Yellow, 46	Touring-1000	Yellow	2384.07
Touring-1000 Yellow, 54	Touring-1000	Yellow	2384.07

Find the Top Products [21-30] based on their Product Price

Skip - OFFSET 20
Fetch - LIMIT 10

ProductName	ModelName	ProductColor	ProductPrice
Touring-1000 Blue, 46	Touring-1000	Blue	2384.07
Touring-1000 Blue, 50	Touring-1000	Blue	2384.07
Touring-1000 Blue, 54	Touring-1000	Blue	2384.07
Touring-1000 Blue, 60	Touring-1000	Blue	2384.07
Road-250 Black, 58	Road-250	Black	2181.5625
Road-250 Black, 52	Road-250	Black	2181.5625
Road-250 Black, 48	Road-250	Black	2181.5625
Road-250 Black, 44	Road-250	Black	2181.5625
Road-250 Red, 58	Road-250	Red	2181.5625
Mountain-200 Silver, 46	Mountain-200	Silver	2071.4196

```sql
SELECT
    ProductName,
    ModelName,
    ProductColor,
    ProductPrice
FROM Products
ORDER BY ProductPrice DESC -- Top to Bottom
LIMIT 10
OFFSET 20; -- Skips First 20 records
```

Find the Top [16-30] Parents based on their Total Children [Top To Bottom]

```sql
SELECT
    FirstName,
    LastName,
    maritalStatus,
    Gender,
    TotalChildren
FROM Customers
ORDER BY TotalChildren DESC
LIMIT 15
OFFSET 15;
```

FirstName	LastName	maritalStatus	Gender	TotalChildren
CALEB	FLORES	M	M	5
JARED	ROGERS	M	M	5
HUNTER	JACKSON	M	M	5
VICTOR	DIAZ	S	M	5
MEREDITH	ALVAREZ	S	F	5
WHITNEY	LOPEZ	M	F	5
TERRANCE	RAMAN	M	M	5
JOHNATHAN	SURI	S	M	5
ERIN	TORRES	M	F	5
ADRIANA	GONZALEZ	S	NA	5
HENRY	GARCIA	M	M	5
RACHAEL	KAPOOR	M	F	5
JACLYN	ZHENG	M	F	5
NICHOLE	SHE	M	F	5
RAFAEL	TANG	S	M	5

```sql
Single Line Comment
Multi Line Comment
```

```sql
Note :
-- represent single line comment.
/* ----------------------------------------*/
represent multi line comment.
```

Aliases 'AS' Renaming the column name, etc.

```
-- ALIASES [Renaming the column name] With Combination of DISTINCT Keyword
SELECT
    DISTINCT EducationLevel AS Education,
    Occupation AS Occupations
FROM Customers;
-- 25 row(s) returned
```

Education	Occupations
Bachelors	Management
Graduate Degree	Management
Partial College	Management
High School	Management
Partial High School	Management
Graduate Degree	Manual
Bachelors	Manual
Partial College	Manual
High School	Manual
Partial High School	Manual
Bachelors	Professional
Partial College	Professional
High School	Professional
Partial High School	Professional
Graduate Degree	Professional
Partial College	Skilled Manual
High School	Skilled Manual
Partial High School	Skilled Manual
Bachelors	Skilled Manual
Graduate Degree	Skilled Manual

```
-- ALIASES [Renaming the Column Headers] [String Manipulation]
SELECT
    CONCAT(Prefix , FirstName, LastName),
    EmailAddress,
    AnnualIncome,
    Occupation
FROM Customers;
```

CONCAT(Prefix , FirstName, LastName)	EmailAddress	AnnualIncome	Occupation
MR.JONYANG	jon24@learnsector.com	$90,000	Professional
MR.EUGENEHUANG	eugene10@learnsector.com	$60,000	Professional
MR.RUBENTORRES	ruben35@learnsector.com	$60,000	Professional
MS.CHRISTYZHU	christy12@learnsector.com		Professional
MRS.ELIZABETHJOHNSON	elizabeth5@learnsector.com	$80,000	Professional
MR.JULIORUIZ	julio1@learnsector.com	$70,000	Professional
MR.MARCOMEHTA	marco14@learnsector.com	$60,000	Professional
MRS.ROBINVERHOFF	rob4@learnsector.com	$60,000	Professional
MR.SHANNONCARLSON	shannon38@learnsector.com	$70,000	Professional
MS.JACQUELYNSUAREZ	jacquelyn20@learnsector.com	$70,000	Professional
MR.CURTISLU	curtis9@learnsector.com	$60,000	Professional
MRS.LAURENWALKER	lauren41@learnsector.com	$100,000	Management
MR.IANJENKINS	ian47@learnsector.com	$100,000	Management
MRS.SYDNEYBENNETT	sydney23@learnsector.com	$100,000	Management
MS.CHLOEYOUNG	chloe23@learnsector.com		Skilled Manual
MR.WYATTHILL	wyatt32@learnsector.com	$30,000	Skilled Manual
MRS.SHANNONWANG	shannon1@learnsector.com	$20,000	Skilled Manual

```
634    -- ALIASES [Renaming the Column Headers] [String Manipulation]
635 •  SELECT
636        CONCAT(Prefix , ' ' , FirstName, ' ' , LastName),
637        EmailAddress,
638        AnnualIncome,
639        Occupation
640    FROM Customers;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CONCAT(Prefix , '' , FirstName, '' , LastName)	EmailAddress	AnnualIncome	Occupation
MR. JON YANG	jon24@learnsector.com	$90,000	Professional
MR. EUGENE HUANG	eugene10@learnsector.com	$60,000	Professional
MR. RUBEN TORRES	ruben35@learnsector.com	$60,000	Professional
MS. CHRISTY ZHU	christy12@learnsector.com		Professional
MRS. ELIZABETH JOHNSON	elizabeth5@learnsector.com	$80,000	Professional
MR. JULIO RUIZ	julio1@learnsector.com	$70,000	Professional
MR. MARCO MEHTA	marco14@learnsector.com	$60,000	Professional
MRS. ROBIN VERHOFF	rob4@learnsector.com	$60,000	Professional
MR. SHANNON CARLSON	shannon38@learnsector.com	$70,000	Professional
MS. JACQUELYN SUAREZ	jacquelyn20@learnsector.com	$70,000	Professional
MR. CURTIS LU	curtis9@learnsector.com	$60,000	Professional

CONCAT_WS() --> Concat_WS stands for Concat a Word Separator

" "

```
-- ALIASES [Renaming the Column Headers] [String Manipulation]
SELECT
    CONCAT_WS(' ',Prefix, FirstName, LastName) AS FullName ,
    EmailAddress,
    AnnualIncome,
    Occupation
FROM Customers;
```

FullName	EmailAddress	AnnualIncome	Occupation
MR. JON YANG	jon24@learnsector.com	$90,000	Professional
MR. EUGENE HUANG	eugene10@learnsector.com	$60,000	Professional
MR. RUBEN TORRES	ruben35@learnsector.com	$60,000	Professional
MS. CHRISTY ZHU	christy12@learnsector.com		Professional
MRS. ELIZABETH JOHNSON	elizabeth5@learnsector.com	$80,000	Professional
MR. JULIO RUIZ	julio1@learnsector.com	$70,000	Professional
MR. MARCO MEHTA	marco14@learnsector.com	$60,000	Professional
MRS. ROBIN VERHOFF	rob4@learnsector.com	$60,000	Professional
MR. SHANNON CARLSON	shannon38@learnsector.com	$70,000	Professional
MS. JACQUELYN SUAREZ	jacquelyn20@learnsector.com	$70,000	Professional
MR. CURTIS LU	curtis9@learnsector.com	$60,000	Professional
MRS. LAUREN WALKER	lauren41@learnsector.com	$100,000	Management

C - Create

R - Read

U - Update

D - Delete

Employees

```
-- CRUD Command
CREATE TABLE Employees(
    EmployeeID INT AUTO_INCREMENT,
    FirstName VARCHAR(50) NOT NULL,
    LastName VARCHAR(50) NOT NULL,
    Email VARCHAR(100) UNIQUE NOT NULL,
    Salary DECIMAL(10,2), -- 99999999.99
    BirthDate DATE NOT NULL, -- YYYY-MM-DD
    Gender CHAR(1),
    IsActive BOOLEAN DEFAULT TRUE,
    PRIMARY KEY(EmployeeID)
);
```

```
659 •  DESC Employees;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Conte

Field	Type	Null	Key	Default	Extra
EmployeeID	int	NO	PRI	NULL	auto_increment
FirstName	varchar(50)	NO		NULL	
LastName	varchar(50)	NO		NULL	
Email	varchar(100)	NO	UNI	NULL	
Salary	decimal(10,2)	YES		NULL	
BirthDate	date	NO		NULL	
Gender	char(1)	YES		NULL	
IsActive	tinyint(1)	YES		1	

```
DESC Employees;

INSERT INTO Employees(FirstName,LastName,Email,Salary,BirthDate,Gender)
VALUES('Pragya','Chowdhury','pragya@gmail.com',1000000,'1997-01-21','F');

SELECT * FROM Employees;

INSERT INTO Employees
VALUES(2,'Soumya','Upadhyay','Soumya@gmail.com',1000000,'1998-05-25','F',1),
(3,'Akshay','malik','aksmalik@gmail.com',7000000,'1997-04-19','M',1);

SELECT * FROM Employees;
```

EmployeeID	FirstName	LastName	Email	Salary	BirthDate	Gender	IsActive
1	Pragya	Chowdhury	pragya@gmail.com	1000000.00	1997-01-21	F	1
2	Soumya	Upadhyay	Soumya@gmail.com	1000000.00	1998-05-25	F	1
3	Akshay	malik	aksmalik@gmail.com	7000000.00	1997-04-19	M	1
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

```
668    -- Create a Duplicate Table For the CRUD Experiment [Using Aliases 'AS']
669 •  CREATE TABLE CustomersDetails AS
670    SELECT * FROM Customers;
671
672 •  DESC Customers;
673 •  DESC CustomersDetails;
674
675 •  SELECT * FROM CustomersDetails;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	Prefix	FirstName	LastName	BirthDate	MyUnknownColumn	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner	Phone_numbe
11000	MR.	JON	YANG	04/08/1966		M	M	jon24@learnsector.com	$90,000	2	Bachelors	Professional	Y	6697921661
11001	MR.	EUGENE	HUANG	14/05/1965		S	M	eugene10@learnsector.com	$60,000	3	Bachelors	Professional	N	8586376955
11002	MR.	RUBEN	TORRES	08/12/1965		M	M	ruben35@learnsector.com	$60,000	3	Bachelors	Professional	Y	6528852745
11003	MS.	CHRISTY	ZHU	15/02/1968		S	F	christy12@learnsector.com		0	Bachelors	Professional	N	3646568427
11004	MRS.	ELIZABETH	JOHNSON	08/08/1968		S	F	elizabeth5@learnsector.com	$80,000	5	Bachelors	Professional	Y	7132265883
11005	MR.	JULIO	RUIZ	08/05/1965		S	M	julio1@learnsector.com	$70,000	0	Bachelors	Professional	Y	1902716743
11007	MR.	MARCO	MEHTA	05/09/1964		M	M	marco14@learnsector.com	$60,000	3	Bachelors	Professional	Y	4203325209

```
-- DROP -> Drop the Table [Along With Structure] [DDL] [Data Defination Language]
-- DROP TABLE <TableName>
DROP TABLE CustomersDetails;
```

```sql
-- Create a Duplicate Table For the CRUD [DML] [Data Manipulation Language]
-- Experiment [Using Aliases 'AS']
CREATE TABLE CustomersDetails AS
SELECT
    CustomerKey,
    FirstName,
    LastName,
    BirthDate AS 'DOB',
    MaritalStatus,
    Gender,
    EmailAddress,
    AnnualIncome,
    TotalChildren,
    EducationLevel,
    Occupation,
    HomeOwner
FROM Customers;

DESCRIBE CustomersDetails;
```

FILTER TABLE IN DAX

Field	Type	Null	Key	Default	Extra
CustomerKey	int	YES		NULL	
FirstName	text	YES		NULL	
LastName	text	YES		NULL	
DOB	text	YES		NULL	
MaritalStatus	text	YES		NULL	
Gender	text	YES		NULL	
EmailAddress	text	YES		NULL	
AnnualIncome	text	YES		NULL	
TotalChildren	int	YES		NULL	
EducationLevel	text	YES		NULL	
Occupation	text	YES		NULL	
HomeOwner	text	YES		NULL	

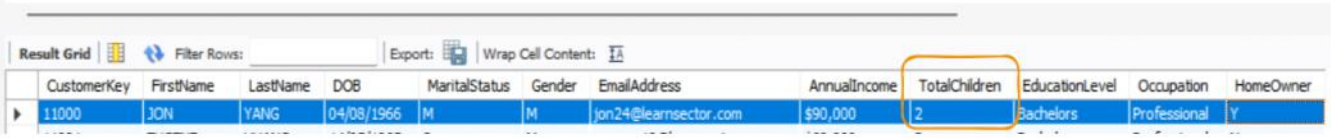
```sql
701 •  SELECT * FROM CustomersDetails;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11000	JON	YANG	04/08/1966	M	M	jon24@learnsector.com	$90,000	2	Bachelors	Professional	Y
11001	EUGENE	HUANG	14/05/1965	S	M	eugene10@learnsector.com	$60,000	3	Bachelors	Professional	N
11002	RUBEN	TORRES	08/12/1965	M	M	ruben35@learnsector.com	$60,000	3	Bachelors	Professional	Y
11003	CHRISTY	ZHU	15/02/1968	S	F	christy12@learnsector.com		0	Bachelors	Professional	N
11004	ELIZABETH	JOHNSON	08/08/1968	S	F	elizabeth5@learnsector.com	$80,000	5	Bachelors	Professional	Y
11005	JULIO	RUIZ	08/05/1965	S	M	julio1@learnsector.com	$70,000	0	Bachelors	Professional	Y
11007	MARCO	MEHTA	05/09/1964	M	M	marco14@learnsector.com	$60,000	3	Bachelors	Professional	Y
11008	ROBIN	VERHOFF	07/07/1964	S	F	rob4@learnsector.com	$60,000	4	Bachelors	Professional	Y
11009	SHANNON	CARLSON	04/01/1964	S	M	shannon38@learnsector.com	$70,000	0	Bachelors	Professional	N
11010	JACQUELYN	SUAREZ	02/06/1964	S	F	jacquelyn20@learnsector.com	$70,000	0	Bachelors	Professional	N
11011	CURTIS	LU	11/04/1963	M	M	curtis9@learnsector.com	$60,000	4	Bachelors	Professional	Y
11012	LAUREN	WALKER	18/01/1968	M	F	lauren41@learnsector.com	$100,000	2	Bachelors	Management	Y
11013	IAN	JENKINS	08/06/1968	M	M	ian47@learnsector.com	$100,000	2	Bachelors	Management	Y
11014	SYDNEY	BENNETT	05/09/1968	S	F	sydney23@learnsector.com	$100,000	3	Bachelors	Management	N
11015	CHLOE	YOUNG	27/02/1979	S	F	chloe23@learnsector.com		0	Partial College	Skilled Manual	N

```
715 •  UPDATE CustomersDetails
716    SET TotalChildren = 3
717    WHERE CustomerKey = 11000;
```

BEFORE

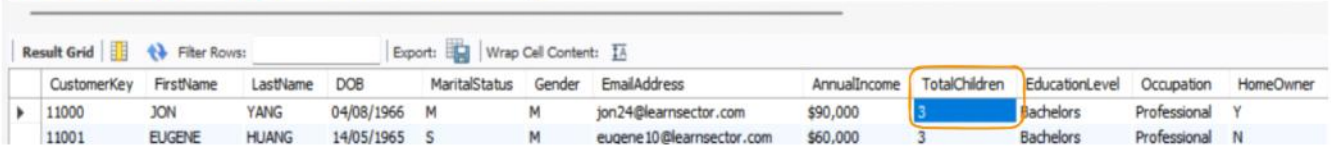


Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11000	JON	YANG	04/08/1966	M	M	jon24@learnsector.com	$90,000	2	Bachelors	Professional	Y

```
722 •  UPDATE CustomersDetails
723    SET TotalChildren = 3
724    WHERE CustomerKey = 11000;
725
726 •  SELECT * FROM CustomersDetails;
```

AFTER



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

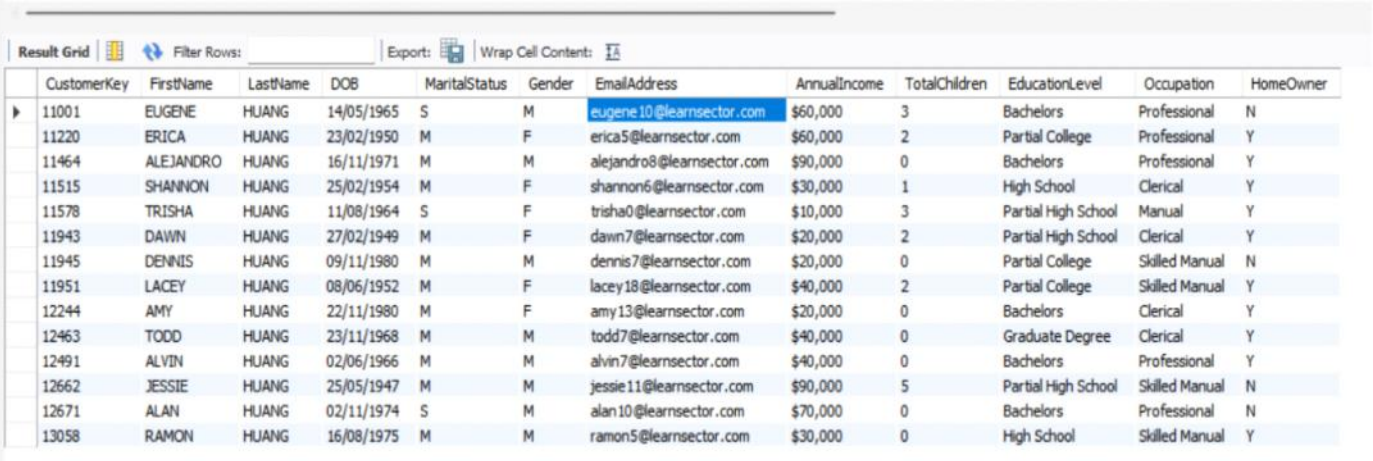
CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11000	JON	YANG	04/08/1966	M	M	jon24@learnsector.com	$90,000	3	Bachelors	Professional	Y
11001	EUGENE	HUANG	14/05/1965	S	M	eugene10@learnsector.com	$60,000	3	Bachelors	Professional	N

```
SET SQL_SAFE_UPDATES = 0;

UPDATE CustomersDetails
SET TotalChildren = 3
WHERE CustomerKey = 11000;

SELECT * FROM CustomersDetails;
```

```
727 •  SELECT * FROM CustomersDetails WHERE LastName LIKE '%Huang%';
```



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11001	EUGENE	HUANG	14/05/1965	S	M	eugene10@learnsector.com	$60,000	3	Bachelors	Professional	N
11220	ERICA	HUANG	23/02/1950	M	F	erica5@learnsector.com	$60,000	2	Partial College	Professional	Y
11464	ALEJANDRO	HUANG	16/11/1971	M	M	alejandro8@learnsector.com	$90,000	0	Bachelors	Professional	Y
11515	SHANNON	HUANG	25/02/1954	M	F	shannon6@learnsector.com	$30,000	1	High School	Clerical	Y
11578	TRISHA	HUANG	11/08/1964	S	F	trisha0@learnsector.com	$10,000	3	Partial High School	Manual	Y
11943	DAWN	HUANG	27/02/1949	M	F	dawn7@learnsector.com	$20,000	2	Partial High School	Clerical	Y
11945	DENNIS	HUANG	09/11/1980	M	M	dennis7@learnsector.com	$20,000	0	Partial College	Skilled Manual	N
11951	LACEY	HUANG	08/06/1952	M	F	lacey18@learnsector.com	$40,000	2	Partial College	Skilled Manual	Y
12244	AMY	HUANG	22/11/1980	M	F	amy13@learnsector.com	$20,000	0	Bachelors	Clerical	Y
12463	TODD	HUANG	23/11/1968	M	M	todd7@learnsector.com	$40,000	0	Graduate Degree	Clerical	Y
12491	ALVIN	HUANG	02/06/1966	M	M	alvin7@learnsector.com	$40,000	0	Bachelors	Professional	Y
12662	JESSIE	HUANG	25/05/1947	M	M	jessie11@learnsector.com	$90,000	5	Partial High School	Skilled Manual	N
12671	ALAN	HUANG	02/11/1974	S	M	alan10@learnsector.com	$70,000	0	Bachelors	Professional	N
13058	RAMON	HUANG	16/08/1975	M	M	ramon5@learnsector.com	$30,000	0	High School	Skilled Manual	Y

```
727 •  SELECT * FROM CustomersDetails WHERE LastName LIKE '%Huang%';
728
729 •  UPDATE CustomersDetails
730    SET EmailAddress = 'huang@learnsector.com'
731    WHERE LastNAME LIKE '%Huang%';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11001	EUGENE	HUANG	14/05/1965	S	M	huang@learnsector.com	$60,000	3	Bachelors	Professional	N
11220	ERICA	HUANG	23/02/1950	M	F	huang@learnsector.com	$60,000	2	Partial College	Professional	Y
11464	ALEJANDRO	HUANG	16/11/1971	M	M	huang@learnsector.com	$90,000	0	Bachelors	Professional	Y
11515	SHANNON	HUANG	25/02/1954	M	F	huang@learnsector.com	$30,000	1	High School	Clerical	Y
11578	TRISHA	HUANG	11/08/1964	S	F	huang@learnsector.com	$10,000	3	Partial High School	Manual	Y
11943	DAWN	HUANG	27/02/1949	M	F	huang@learnsector.com	$20,000	2	Partial High School	Clerical	Y
11945	DENNIS	HUANG	09/11/1980	M	M	huang@learnsector.com	$20,000	0	Partial College	Skilled Manual	N
11951	LACEY	HUANG	08/06/1952	M	F	huang@learnsector.com	$40,000	2	Partial College	Skilled Manual	Y
12244	AMY	HUANG	22/11/1980	M	F	huang@learnsector.com	$20,000	0	Bachelors	Clerical	Y
12463	TODD	HUANG	23/11/1968	M	M	huang@learnsector.com	$40,000	0	Graduate Degree	Clerical	Y
12491	ALVIN	HUANG	02/06/1966	M	M	huang@learnsector.com	$40,000	0	Bachelors	Professional	Y
12662	JESSIE	HUANG	25/05/1947	M	M	huang@learnsector.com	$90,000	5	Partial High School	Skilled Manual	N
12671	ALAN	HUANG	02/11/1974	S	M	huang@learnsector.com	$70,000	0	Bachelors	Professional	N
13058	RAMON	HUANG	16/08/1975	M	M	huang@learnsector.com	$30,000	0	High School	Skilled Manual	Y

```
SELECT * FROM CustomersDetails WHERE EducationLevel LIKE "%High%";

UPDATE CustomersDetails
SET EducationLevel = "High School"
WHERE EducationLevel LIKE "%High%";

-- 122 row(s) affected Rows matched: 464  Changed: 122  Warnings: 0
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11017	SHANNON	WANG	26/06/1944	S	F	shannon1@learnsector.com	$20,000	4	High School	Skilled Manual	Y
11019	LUKE	LAL	03/07/1978	S	M	luke18@learnsector.com	$40,000	0	High School	Skilled Manual	N
11020	JORDAN	KING	20/09/1978	S	M	jordan73@learnsector.com	$40,000	0	High School	Skilled Manual	N
11025	ALEJANDRO	BECK	23/12/1945	M	NA	alejandro45@learnsector.com	$10,000	2	High School	Clerical	Y
11030	BETHANY	YUAN	22/02/1947	M	F	bethany10@learnsector.com	$10,000	2	High School	Clerical	Y
11031	THERESA	RAMOS	22/08/1947	M	F	theresa13@learnsector.com	$20,000	4	High School	Skilled Manual	Y
11032	DENISE	STONE	06/11/1947	M	F	denise10@learnsector.com	$20,000	4	High School	Skilled Manual	Y
11033	JAIME	NATH	23/09/1947	M	M	jaime41@learnsector.com	$20,000	4	High School	Skilled Manual	Y
11034	EBONY	GONZALEZ	19/06/1947	M	F	ebony19@learnsector.com	$20,000	4	High School	Skilled Manual	Y
11035	WENDY	DOMINGUEZ	24/02/1948	M	NA	wendy12@learnsector.com	$10,000	2	High School	Clerical	Y
11037	CHLOE	GARCIA	27/11/1977	S	F	chloe27@learnsector.com	$40,000	0	High School	Clerical	N
11038	DIANA	HERNANDEZ	23/03/1948	M	F	diana2@learnsector.com	$10,000	2	High School	Clerical	Y
11044	ADAM	FLORES	24/05/1949	M	M	adam10@learnsector.com	$20,000	2	High School	Clerical	Y
11045	LEONARD	NARA	19/05/1950	S	M	leonard18@learnsector.com	$30,000	3	High School	Skilled Manual	N
11046	CHRISTINE	YUAN	22/03/1950	M	F	christine4@learnsector.com	$30,000	3	High School	Skilled Manual	Y
11047	JACLYN	LU	27/02/1950	M	F	jaclyn12@learnsector.com	$30,000	3	High School	Skilled Manual	N

```
741 •  SELECT DISTINCT Gender FROM CustomersDetails;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Gender
M
F
NA

```
744 •  SELECT * FROM Customers WHERE Gender LIKE '%NA%';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	Prefix	FirstName	LastName	BirthDate	MyUnknownColumn	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner	Phone
11082		ANGELA	BUTLER	08/04/1966		S	NA	angela17@learnsector.com	$130,000	0	Graduate Degree	Management	N	50474
11234		ANNA	GRIFFIN	19/11/1952		S	NA	anna46@learnsector.com	$70,000	4	Partial College	Professional	Y	80877
11475		CESAR	SUBRAM	10/09/1978		S	NA	cesar12@learnsector.com	$30,000	0	High School	Manual	N	53696
11526		KATHERINE	DIAZ	08/06/1956		M	NA	katherine48@learnsector.com	$40,000	1	Partial College	Clerical	Y	58315
11623		ANGELA	PERRY	27/06/1973		S	NA	angela10@learnsector.com	$50,000	1	Graduate Degree	Skilled Manual	Y	73286
11643		NAOMI	MUNOZ	27/07/1970		M	NA	naomi7@learnsector.com	$50,000	1	Bachelors	Skilled Manual	Y	91916
11965		KATIE	SHE	19/10/1956		S	NA	katie3@learnsector.com	$70,000	2	High School	Skilled Manual	Y	12931
12276		ALISHA	SHAN	13/07/1970		M	NA	alisha34@learnsector.com	$30,000	0	Bachelors	Clerical	Y	11323
12283		TODD	ZENG	08/10/1969		S	NA	todd19@learnsector.com	$20,000	0	Partial College	Manual	Y	82569
12300		ADRIANA	GONZALEZ	18/07/1946		S	NA	adriana19@learnsector.com	$80,000	5	Partial College	Professional	Y	71119
12372		DARREN	PRASAD	18/09/1963		S	NA	darren12@learnsector.com	$60,000	3	Bachelors	Professional	N	42367
12446		JASMINE	HALL	08/03/1957		M	NA	jasmine21@learnsector.com	$40,000	1	Partial College	Clerical	Y	21626
12517		ALEXA	WATSON	25/08/1977		S	NA	alexa0@learnsector.com	$30,000	0	Partial College	Clerical	N	37233
12765		ROBYN	GILL	20/05/1954		M	NA	robyn11@learnsector.com	$20,000	2	Partial High School	Manual	N	59220
12790		BRANDON	KUMAR	10/05/1958		S	NA	brandon25@learnsector.com	$60,000	4	Graduate Degree	Skilled Manual	Y	81682
12936		RENEE	MORENO	27/03/1965		S	NA	renee6@learnsector.com	$40,000	0	Bachelors	Professional	Y	10019

```
UPDATE CustomersDetails
SET Gender = NULL
WHERE Gender LIKE '%NA%';
```

```
745 •  SELECT * FROM CustomersDetails WHERE Gender LIKE '%NA%';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner

IS NULL / IS NOT NULL

```
751 •  SELECT * FROM CustomersDetails WHERE Gender IS NULL;
```

18 records

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11082	ANGELA	BUTLER	08/04/1966	S	NULL	angela17@learnsector.com	$130,000	0	Graduate Degree	Management	N
11234	ANNA	GRIFFIN	19/11/1952	S	NULL	anna46@learnsector.com	$70,000	4	Partial College	Professional	Y
11475	CESAR	SUBRAM	10/09/1978	S	NULL	cesar12@learnsector.com	$30,000	0	High School	Manual	N
11526	KATHERINE	DIAZ	08/06/1956	M	NULL	katherine48@learnsector.com	$40,000	1	Partial College	Clerical	Y
11623	ANGELA	PERRY	27/06/1973	S	NULL	angela10@learnsector.com	$50,000	1	Graduate Degree	Skilled Manual	Y
11643	NAOMI	MUNOZ	27/07/1970	M	NULL	naomi7@learnsector.com	$50,000	1	Bachelors	Skilled Manual	Y
11965	KATIE	SHE	19/10/1956	S	NULL	katie3@learnsector.com	$70,000	2	High School	Skilled Manual	Y
12276	ALISHA	SHAN	13/07/1970	M	NULL	alisha34@learnsector.com	$30,000	0	Bachelors	Clerical	Y
12283	TODD	ZENG	08/10/1969	S	NULL	todd19@learnsector.com	$20,000	0	Partial College	Manual	Y
12300	ADRIANA	GONZALEZ	18/07/1946	S	NULL	adriana19@learnsector.com	$80,000	5	Partial College	Professional	Y
12372	DARREN	PRASAD	18/09/1963	S	NULL	darren12@learnsector.com	$60,000	3	Bachelors	Professional	N
12446	JASMINE	HALL	08/03/1957	M	NULL	jasmine21@learnsector.com	$40,000	1	Partial College	Clerical	Y
12517	ALEXA	WATSON	25/08/1977	S	NULL	alexa0@learnsector.com	$30,000	0	Partial College	Clerical	N
12765	ROBYN	GILL	20/05/1954	M	NULL	robyn11@learnsector.com	$20,000	2	High School	Manual	N
12790	BRANDON	KUMAR	10/05/1958	S	NULL	brandon25@learnsector.com	$60,000	4	Graduate Degree	Skilled Manual	Y
12936	RENEE	MORENO	27/03/1965	S	NULL	renee6@learnsector.com	$40,000	0	Bachelors	Professional	Y

```
754    -- 2062-18 = 2044 records ['M','F']
755 •  SELECT * FROM CustomersDetails WHERE Gender IS NOT NULL; -- 2044 row(s) returned
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11000	JON	YANG	04/08/1966	M	M	jon24@learnsector.com	$90,000	3	Bachelors	Professional	Y
11001	EUGENE	HUANG	14/05/1965	S	M	huang@learnsector.com	$60,000	3	Bachelors	Professional	N
11002	RUBEN	TORRES	08/12/1965	M	M	ruben35@learnsector.com	$60,000	3	Bachelors	Professional	Y
11003	CHRISTY	ZHU	15/02/1968	S	F	christy12@learnsector.com		0	Bachelors	Professional	N
11004	ELIZABETH	JOHNSON	08/08/1968	S	F	elizabeth5@learnsector.com	$80,000	5	Bachelors	Professional	Y
11005	JULIO	RUIZ	08/05/1965	S	M	julio1@learnsector.com	$70,000	0	Bachelors	Professional	Y
11007	MARCO	MEHTA	05/09/1964	M	M	marco14@learnsector.com	$60,000	3	Bachelors	Professional	Y
11008	ROBIN	VERHOFF	07/07/1964	S	F	rob4@learnsector.com	$60,000	4	Bachelors	Professional	Y
11009	SHANNON	CARLSON	04/01/1964	S	M	shannon38@learnsector.com	$70,000	0	Bachelors	Professional	N
11010	JACQUELYN	SUAREZ	02/06/1964	S	F	jacquelyn20@learnsector.com	$70,000	0	Bachelors	Professional	N
11011	CURTIS	LU	11/04/1963	M	M	curtis9@learnsector.com	$60,000	4	Bachelors	Professional	Y
11012	LAUREN	WALKER	18/01/1968	M	F	lauren41@learnsector.com	$100,000	2	Bachelors	Management	Y
11013	IAN	JENKINS	08/06/1968	M	M	ian47@learnsector.com	$100,000	2	Bachelors	Management	Y
11014	SYDNEY	BENNETT	05/09/1968	S	F	sydney23@learnsector.com	$100,000	3	Bachelors	Management	N
11015	CHLOE	YOUNG	27/02/1979	S	F	chloe23@learnsector.com		0	Partial College	Skilled Manual	N
11016	WYATT	HILL	28/04/1979	M	M	wyatt32@learnsector.com	$30,000	0	Partial College	Skilled Manual	Y
11017	SHANNON	WANG	26/06/1944	S	F	shannon1@learnsector.com	$20,000	4	High School	Skilled Manual	Y

```
757    -- "" [FILTER]
758 •  SELECT * FROM CustomersDetails WHERE AnnualIncome LIKE ""; 10 Records
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11003	CHRISTY	ZHU	15/02/1968	S	F	christy12@learnsector.com		0	Bachelors	Professional	N
11015	CHLOE	YOUNG	27/02/1979	S	F	chloe23@learnsector.com		0	Partial College	Skilled Manual	N
11081	SAVANNAH	BAKER	24/07/1966	M	F	savannah39@learnsector.com		2	Bachelors	Management	Y
11130	CAROLINE	RUSSELL	01/06/1980	M	F	caroline21@learnsector.com		0	High School	Skilled Manual	Y
11227	MARSHALL	CHAVEZ	08/12/1951	S	M	marshall35@learnsector.com		2	Partial College	Professional	Y
11359	JARROD	PRASAD	09/04/1978	S	M	jarrod9@learnsector.com		0	Partial College	Manual	N
11552	EDDIE	RUBIO	27/05/1967	S	M	eddie21@learnsector.com		1	Partial College	Manual	N
11673	SUSAN	YE	02/07/1966	S	F	susan19@learnsector.com		3	Bachelors	Skilled Manual	Y
12152	ADRIAN	RAMIREZ	26/03/1964	M	M	adrian9@learnsector.com		2	Bachelors	Management	Y
12756	ANTONIO	BUTLER	26/06/1975	S	M	antonio14@learnsector.com		3	Partial College	Clerical	Y

DELETE [DML]

```
-- DELETE Command
-- SYNTAX - DELETE FROM <TableName>; -- Delete All Records (**) [Dangerous]
-- DELETE FROM <TableName> WHERE <Location>
```

```
DELETE FROM CustomersDetails
WHERE AnnualIncome LIKE ""; -- 10 row(s) affected

SELECT * FROM CustomersDetails; -- 2052 row(s) returned
```

```sql
-- Delete the Customer Who are not a HomeOwner....

DELETE FROM CustomersDetails
WHERE HomeOwner LIKE '%N%';

SELECT * FROM CustomersDetails; -- 1498 row(s) returned
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner
11000	JON	YANG	04/08/1966	M	M	jon24@learnsector.com	$90,000	3	Bachelors	Professional	Y
11002	RUBEN	TORRES	08/12/1965	M	M	ruben35@learnsector.com	$60,000	3	Bachelors	Professional	Y
11004	ELIZABETH	JOHNSON	08/08/1968	S	F	elizabeth5@learnsector.com	$80,000	5	Bachelors	Professional	Y
11005	JULIO	RUIZ	08/05/1965	S	M	julio1@learnsector.com	$70,000	0	Bachelors	Professional	Y
11007	MARCO	MEHTA	05/09/1964	M	M	marco14@learnsector.com	$60,000	3	Bachelors	Professional	Y
11008	ROBIN	VERHOFF	07/07/1964	S	F	rob4@learnsector.com	$60,000	4	Bachelors	Professional	Y
11011	CURTIS	LU	11/04/1963	M	M	curtis9@learnsector.com	$60,000	4	Bachelors	Professional	Y
11012	LAUREN	WALKER	18/01/1968	M	F	lauren41@learnsector.com	$100,000	2	Bachelors	Management	Y
11013	IAN	JENKINS	08/06/1968	M	M	ian47@learnsector.com	$100,000	2	Bachelors	Management	Y
11016	WYATT	HILL	28/04/1979	M	M	wyatt32@learnsector.com	$30,000	0	Partial College	Skilled Manual	Y
11017	SHANNON	WANG	26/06/1944	S	F	shannon1@learnsector.com	$20,000	4	High School	Skilled Manual	Y
11018	CLARENCE	RAI	10/09/1944	S	M	clarence32@learnsector.com	$30,000	2	Partial College	Clerical	Y

```sql
DELETE FROM Customers; -- All Records Deleted.....
SELECT * FROM Customers;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	Prefix	FirstName	LastName	BirthDate	MyUnknownColumn	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner	Phone_number

Delete Command won't Impact the Structure

"Rollback"

Customers 57

Output

Action Output

#	Time	Action	Message	Dura
77	13:31:23	DELETE FROM Customers	2062 row(s) affected	0.09
78	13:31:58	SELECT * FROM Customers LIMIT 0, 5000	0 row(s) returned	0.00

```sql
DESC Customers;
```

Result Grid | Filter Rows: | Export: | Wrap

Field	Type	Null	Key	Default	Extra
CustomerKey	int	YES		NULL	
Prefix	text	YES		NULL	
FirstName	text	YES		NULL	
LastName	text	YES		NULL	
BirthDate	text	YES		NULL	
MyUnknownColumn	text	YES		NULL	
MaritalStatus	text	YES		NULL	
Gender	text	YES		NULL	
EmailAddress	text	YES		NULL	
AnnualIncome	text	YES		NULL	
TotalChildren	int	YES		NULL	
EducationLevel	text	YES		NULL	

DROP [DDL] - Remove the data + Structure

```
DROP TABLE Customers;
DESC Customers;
-- Error Code: 1146. Table 'weekend_analysis.customers' doesn't exist
```

Truncate

```
784    -- TRUNCATE [DDL] -> Data Flash Speed [Faster] [Rollback Doesn't Exist]
785 •  TRUNCATE TABLE CustomersDetails;
786 •  DESC CustomersDetails;
787 •  SELECT * FROM CustomersDetails;
```

Where Clause ✗

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

CustomerKey	FirstName	LastName	DOB	MaritalStatus	Gender	EmailAddress	AnnualIncome	TotalChildren	EducationLevel	Occupation	HomeOwner

ACID PROPERTIES

A - Atomicity

C - Consistency

I - Isolation

D - Durability

DML - Data Manipulation Language
Language [CRUD]

DDL - Data Definition Language
[Alter , Drop, Truncate]

TCL - Transaction Control Language
[Rollback, START TRANSACTION, COMMIT]

DCL - Data Control Language [DBA]
[GRANT , REVOKE]

What is ACID?

✅ A – Atomicity

Definition: A transaction is atomic—it either completes fully or doesn't happen at all.

- If any part of the transaction fails, the entire transaction is rolled back.
- Prevents partial updates to the database.

🔍 Example:

Imagine you're transferring money:

From Account A (Alice) to Account B (Bob).

Transaction steps:
- Debit $100 from Alice.
- Credit $100 to Bob.

If step 1 succeeds but step 2 fails due to a system crash:
Atomicity ensures Alice is not charged, and the whole transaction is undone.

✅ C – Consistency

Definition: A transaction must transform the database from one valid state to another.

- Ensures database rules, such as constraints, are never violated.
- Maintains the integrity of the data.

🔍 Example:

If a rule says an account balance can't go negative:

- Before the transaction: Alice has $100.
- A transaction trying to withdraw $150 would be rejected.
- Consistency ensures that all business rules are respected.

✅ I – Isolation

Definition: Concurrent transactions must not interfere with each other.

- Transactions appear to execute one at a time, even if they run concurrently.
- Ensures no dirty reads, non-repeatable reads, or phantom reads (depending on isolation level).

🔍 Example:

T1: Alice transfers $50 to Bob.

T2: Charlie views Bob's balance.

Isolation ensures that T2 sees either the balance before or after T1, not an in-between state.

✅ D – Durability

Definition: Once a transaction commits, its changes are permanent, even in the event of a system crash.

- Ensures that committed data is safely stored (typically in non-volatile memory).

🔍 Example:

- You book a movie ticket online.
- After the "Success" page, the server crashes.
- Durability ensures that your booking is saved and won't be lost.