TRANSACTIONS

Transactions

- A transaction is a unit of work that is performed against a database. For example, if you are creating a record or updating a record or deleting a record from the table, then you are performing a transaction on the table.

Properties of Transactions

Transactions have the following four standard properties, usually referred to by the acronym ACID:

Atomicity: Ensures that all operations within the work unit are completed successfully; otherwise, the transaction is aborted at the point of failure, and previous operations are rolled back to their former state.

Consistency: Ensures that the database properly changes state upon a successfully committed transaction.

Isolation: Enables transactions to operate independently of and transparent to each other.

Durability: Ensures that the result or effect of a committed transaction persists in case of a system failure

Transactions

There are following commands used to control transactions:

- **COMMIT**: To save the changes.
- **ROLLBACK**: To roll back the changes.
- **SAVEPOINT**: Creates points within groups of transactions in which to ROLLBACK.

AUTO INCREMENT FIELD

Auto Increment

Auto Increment allows a unique number to be generated automatically when a new record is added in to the table.

- Identity (START, INCREMENT)

Example :

```
create table emp2
(id int identity (1,1) primary key,
EID varchar (30),
age int);
```

SEQUENCES

Sequences

Sequences are the objects in SQL Server that is used to generate a number sequence. These are normally used to create a unique number.

- **Syntax**

```
CREATE SEQUENCE sequence_EID
[ AS datatype ]
[ START WITH value ]
[ INCREMENT BY value ]
[ MINVALUE value | NO MINVALUE ]
[ MAXVALUE value | NO MAXVALUE ]
[ CYCLE | NO CYCLE ]
[ CACHE value | NO CACHE ];
```

Sequences

- **Example 1:**

```
Create sequence MYSEQ
AS INT
START WITH 1
INCREMENT BY 1
MINVALUE 1
MAXVALUE 1000
No CYCLE
CACHE 5;
```

- **Example 2:**

```
Create sequence MYSEQ
START WITH 1
INCREMENT BY 1
```

Drop Sequence MYSEQ;

NOTE: Sequences are the global objects, however, auto increment works on the table level

Sequences

- Using Sequences

```
SELECT NEXT VALUE FOR MYSEQ;
```

- Using sequence in the insert statement.

```
INSERT INTO CANDIDATE VALUES (NEXT VALUE FOR MYSEQ,'AJAY');
```

- Procedure using sequence to generate the candidate ID and insert the data in table.

```
CREATE PROCEDURE ADDCANDIDATE (@N AS VARCHAR(50))
AS
BEGIN
    DECLARE @A AS INT;
    DECLARE @C AS CHAR(5);
    SET @A = ( NEXT VALUE FOR MYSEQ);
    IF @A <10
            SET @C = CONCAT('C00' , @A);
    ELSE IF @A<100
            SET @C = CONCAT('C0' , @A);
    ELSE IF @A<1000
            SET @C = CONCAT('C' , @A);

    INSERT INTO  CANDIDATE VALUES (@C, @N);
END;
```

Auto Generation of ID Using Sequence

Function to generate a Alpha Numeric ID

```
CREATE FUNCTION GENID (@C CHAR (1) , @I INT)
RETURNS CHAR(5)
AS
BEGIN
    DECLARE @r  CHAR(5);
    DECLARE @ID  CHAR(5);
SELECT @R = CASE
                        WHEN @I < 10 THEN CONCAT(@C,'000')
                        WHEN @I < 100 THEN CONCAT(@C,'00')
                        WHEN @I < 1000 THEN CONCAT(@C,'0')
                        WHEN @I < 10000 THEN @C
                        ELSE 'NULL'
              END;
 SET @ID= RTRIM(@R) + LTRIM(CONVERT(CHAR(4),@I));
    RETURN @ID;
END;
```

Auto Generation of ID Using Sequence

Using user defined function with a sequence in a procedure to add an student in to the table:

```
CREATE PROCEDURE ADDSTU @X CHAR(20)
AS
BEGIN
    SET NOCOUNT ON;

    INSERT INTO STU
    VALUES(DBO.GENID('S',NEXT VALUE FOR MYSEQ),@X);

    SELECT * FROM STU;



END;
```

ASSIGNMENT – 9

A-1 : CREATE A FUNCTION FOR AUTOGENERATION OF 5 CHARACTERS ALPHA NUMERIC ID. IT SHOULD ACCEPT 2 PARAMETERS A CHARACTER AND THE NUMBER AND RETURN THE ID BY CONCANATING THE CHARACTER , REQUIRED ZEROS AND THE SPECIFIED NUMBER.

RECREATE BELOW PROCEDURES IN THE INVENTORY DATABASE AS SPECIFIED (ALL THE ID s SHOULD BE AUTOMATICALLY GENERATED USING ABOVE CREATED FUNCTION AND SEQUENCES) :

ADDSUPPLIER – SHOULD ADD THE SUPPLIER IN THE SUPLIER TABLE AND DISPLAY THE DETAILS OF THE NEW SUPPLIER ADDED.

ADDPRO – SHOULD ADD THE PRODUCT IN THE PRODUCT TABLE AND DISPLAY THE DETAILS OF THE NEW PRODUCT ADDED.

ADDCUST – SHOULD ADD THE CUSTOMER IN THE CUSTOMER TABLE AND DISPLAY THE DETAILS OF THE NEW CUSTOMER ADDED.

ADDORDER – SHOULD ADD THE ORDER IN THE ORDERS TABLE AND DISPLAY THE DETAILS OF THE ORDER. ORDER DATE SHOULD BE CURRENT DATE AND SHOULD COME AUTOMATICALLY.