T-SQL

STANDARD ELEMENTS

SLIDE Overview

- Types of commands and statement elements
- Basic SELECT statements

Commands and Statement Elements

Categories of T-SQL statements

Data Manipulation Language (DML*)

- Statements for querying and modifying data
- SELECT, INSERT, UPDATE, DELETE

Data Definition Language (DDL)

- Statements for object definitions
- CREATE, ALTER, DROP

Data Control Language (DCL)

- Statements for security permissions
- GRANT, REVOKE, DENY

T-SQL language elements

Predicates and Operators

Functions

Variables

Expressions

Batch Separators

Control of Flow

Comments

T-SQL language elements: predicates and operators

Elements:	**Predicates and Operators:**
Predicates	IN, BETWEEN, LIKE
Comparison Operators	=, >, <, >=, <=, <>, !=, !>, !<
Logical Operators	AND, OR, NOT
Arithmetic Operators	+, -, *, /, %
Concatenation	+

T-SQL enforces operator precedence

T-SQL language elements: functions

String Functions

- SUBSTRING
- LEFT, RIGHT
- LEN
- DATALENGTH
- REPLACE
- REPLICATE
- UPPER, LOWER
- RTRIM, LTRIM

Date and Time Functions

- GETDATE
- SYSTDATETIME
- GETUTCDATE
- DATEADD
- DATEDIFF
- YEAR
- MONTH
- DAY

Aggregate Functions

- SUM
- MIN
- MAX
- AVG
- COUNT

T-SQL language elements: variables

- Local variables in T-SQL temporarily store a value of a specific data type
- Name begins with single @ sign
  - @@ reserved for system functions
- Assigned a data type
- Must be declared and used within the same batch
- In SQL Server 2008 and later, can declare and initialize in the same statement

```
DECLARE @MyVar int = 30;
```

T-SQL language elements: expressions

- Combination of identifiers, values, and operators evaluated to obtain a single result
- Can be used in SELECT statements
  - SELECT clause
  - WHERE clause
- Can be single constant, single-valued function, or variable
- Can be combined if expressions have same the data type

```
SELECT YEAR(OrderDate) + 1 ...
```

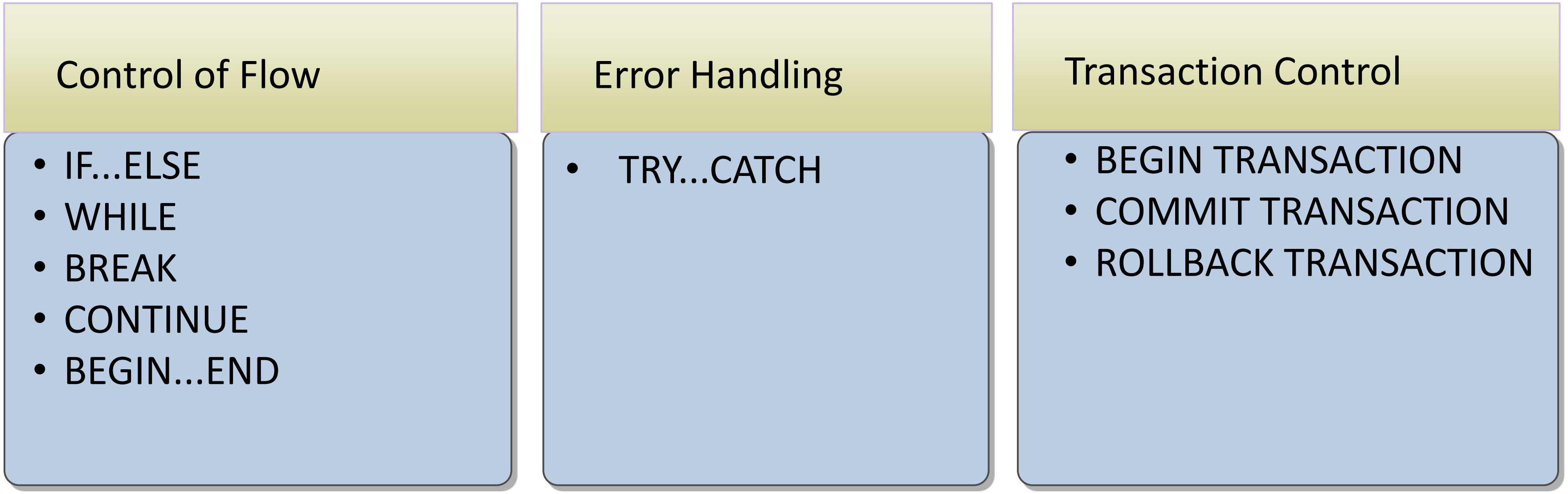
```
SELECT OrderQty * UnitPrice ...
```

T-SQL language elements: batch separators

- Batches are sets of commands sent to SQL Server as a unit
- Batches determine variable scope, name resolution
- To separate statements into batches, use a separator:
  - SQL Server tools use the GO keyword
  - GO is not a SQL Server T-SQL command

T-SQL language elements: control of flow, errors, and transactions

- Allow you to control the flow of execution within code, handle errors, and maintain transactions
- Used in programmatic code objects
  - Stored procedures, triggers, statement blocks



Control of Flow

- IF...ELSE
- WHILE
- BREAK
- CONTINUE
- BEGIN...END

Error Handling

- TRY...CATCH

Transaction Control

- BEGIN TRANSACTION
- COMMIT TRANSACTION
- ROLLBACK TRANSACTION

T-SQL language elements: comments

- Marks T-SQL code as a comment:
  - For a block, enclose it between /* and */ characters

```
/*
              This is a block
  of commented code
*/
```

  - For inline text, precede the comments with --

```
--     This line of text will be ignored
```

- T-SQL Editors such as SSMS will typically color-code comments, as shown above

Logical query processing

- The order in which a query is written is not the order in which it is evaluated by SQL Server.

```
5: SELECT      <select list>
1: FROM        <table source>
2: WHERE       <search condition>
3: GROUP BY    <group by list>
4: HAVING      <search condition>
6: ORDER BY    <order by list>
```

Applying the logical order of operations to writing SELECT statements

```sql
USE AdventureWorks2012;

SELECT SalesPersonID, YEAR(OrderDate) AS OrderYear
FROM Sales.SalesOrderHeader
WHERE CustomerID = 29974
GROUP BY SalesPersonID, YEAR(OrderDate)
HAVING COUNT(*) > 1
ORDER BY SalesPersonID, OrderYear;
```

Basic SELECT Statements

Elements of the SELECT statement

Clause	Expression
SELECT	**<select list>**
FROM	**<table source>**
WHERE	<search condition>
GROUP BY	<group by list>
ORDER BY	<order by list>

Retrieving columns from a table or view

- Use SELECT with column list to display columns
- Use FROM to specify a source table or view
  - Specify both schema and table names
- Delimit names if necessary
- End all statements with a semicolon

Keyword	Expression
SELECT	**<select list>**
FROM	**<table source>**

```sql
SELECT CustomerID, StoreID
FROM Sales.Customer;
```

Using calculations in the SELECT clause

- Calculations are scalar, returning one value per row

Operator	Description
+	Add or concatenate
-	Subtract
*	Multiply
/	Divide
%	Modulo

- Using scalar expressions in the SELECT clause

```sql
SELECT unitprice, OrderQty, (unitprice * OrderQty)
FROM sales.salesorderdetail;
```

Summary

- Three types of command used to manage SQL server objects and security include; DDL, DML, and DCL

- T-SQL language elements include;
- Predicates and operators – BETWEEN, LIKE, NOT, >=, *
- Functions – string, date and time, aggregate
- Variables – local has one @, system has two @@
- Expressions – identifiers, values, and operators
- Batch separators – GO used to separate statements
- Control-of-flow – IF…ELSE, WHILE, CONTINUE
- Comments - /* to start */ to end; can also use --

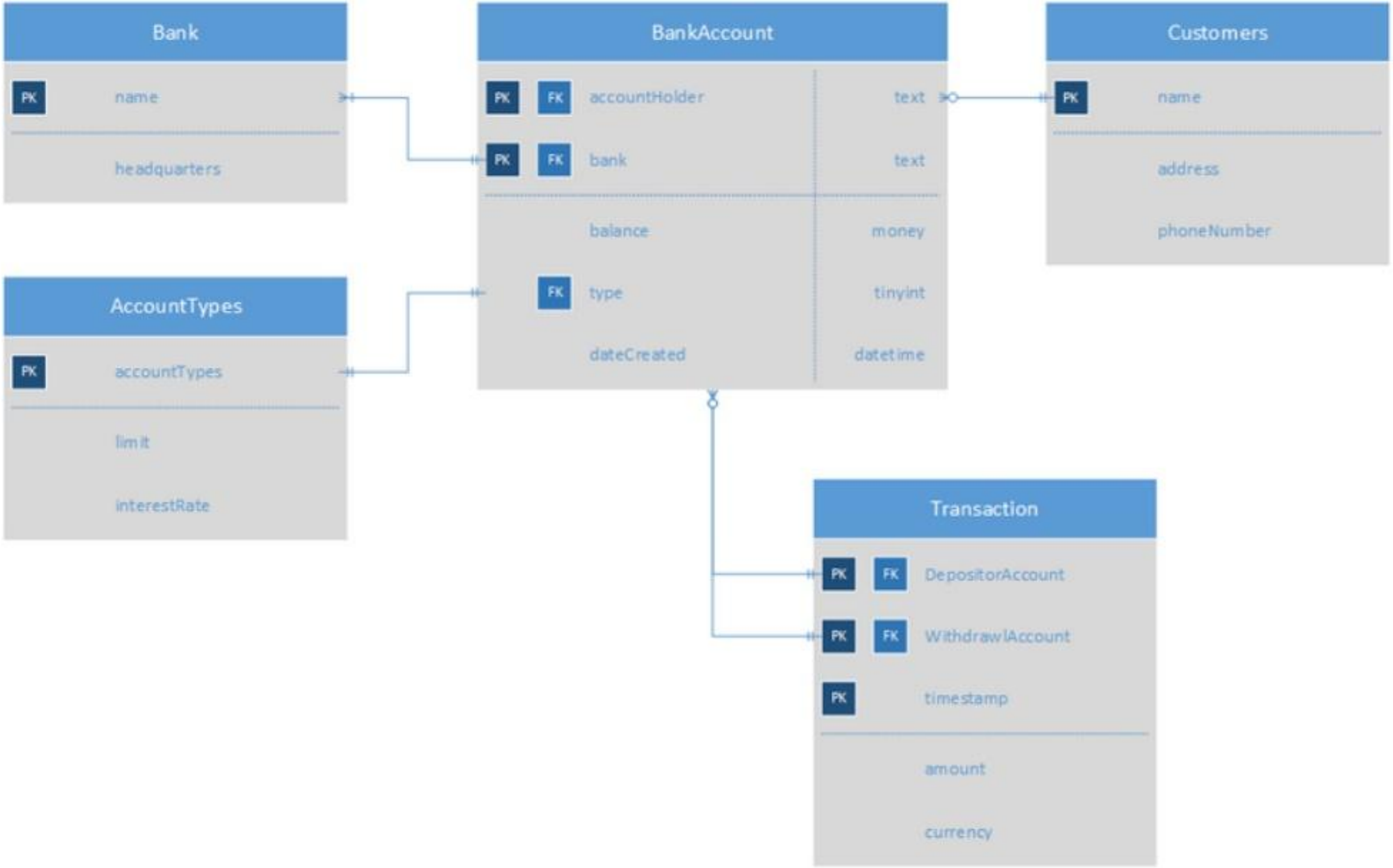
Summary

- Predicate logic is a property or expression that is either true or false. Also referred to as a Boolean expression

- Elements of a SELECT statement and the order they are evaluated :
- 1. FROM
- 2. WHERE
- 3. GROUP BY
- 4. HAVING
- 5. SELECT
- 6. ORDER BY

TASK 6:

Design a physical database **MYBANK1** and following tables on MS SQL SERVER by using **T-SQL:**



Bank

PK	name	
	headquarters	

BankAccount

PK	FK	accountHolder	text
PK	FK	bank	text
		balance	money
	FK	type	tinyint
		dateCreated	datetime

Customers

PK	name
	address
	phoneNumber

AccountTypes

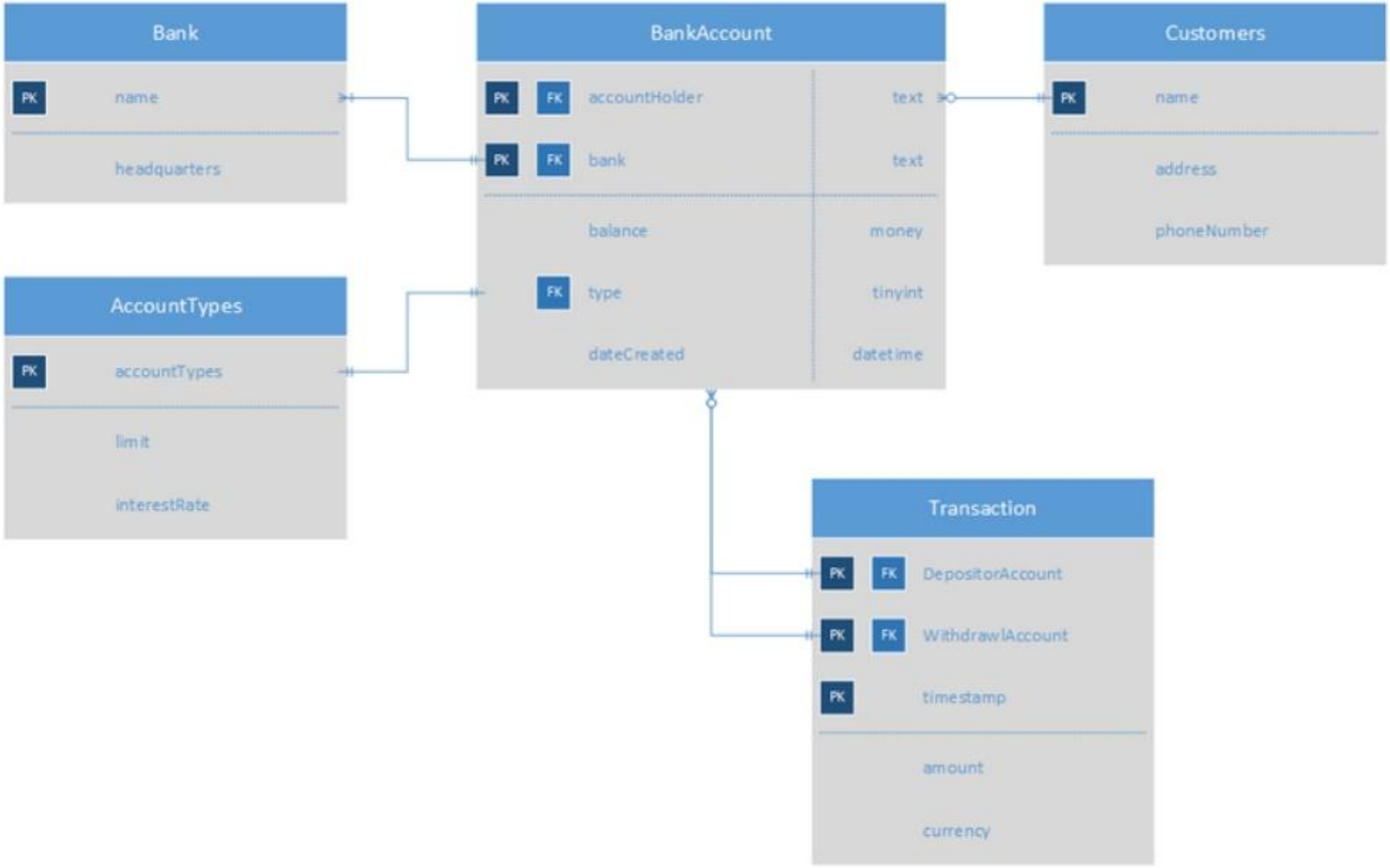
PK	accountTypes
	limit
	interestRate

Transaction

PK	FK	DepositorAccount
PK	FK	WithdrawlAccount
PK		timestamp
		amount
		currency

TASK 7:

Design a physical database **MYBANK2** using **diagramming tool** in MS SQL SERVER.



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AccountTypes

PK	accountTypes
	limit
	interestRate

Transaction

PK	FK	DepositorAccount
PK	FK	WithdrawlAccount
PK		timestamp
		amount
		currency

Referance:

TSQL2012 Sample Database Code

Refer:

CREATE DATABASE (Transact-SQL)
http://technet.microsoft.com/en-us/library/ms176061.aspx

CREATE TABLE (Transact-SQL)
http://technet.microsoft.com/en-us/library/ms174979.aspx

ALTER TABLE (Transact-SQL)
http://technet.microsoft.com/en-us/library/ms190273.aspx