

20 SQL Server Error Handling Examples

1. Insert a valid student inside TRY...CATCH

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (1, 'Ali Hassan', 20, 'ali@example.com', 3.5);

    PRINT 'Student inserted successfully.';

END TRY

BEGIN CATCH

    PRINT 'Error occurred: ' + ERROR_MESSAGE();

END CATCH
```

2. Insert a student with duplicate StudentID

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (1, 'Sara Ahmed', 19, 'sara@example.com', 3.8);

END TRY

BEGIN CATCH

    PRINT 'Duplicate StudentID error: ' + ERROR_MESSAGE();

END CATCH
```

3. Insert a student with age below the allowed value

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (2, 'Yousef Adel', 14, 'yousef@example.com', 2.9);

END TRY

BEGIN CATCH

    PRINT 'Invalid age: ' + ERROR_MESSAGE();

END CATCH
```

4. Use THROW to create a custom error if GPA is NULL

```
DECLARE @GPA DECIMAL(3,2) = NULL;

IF @GPA IS NULL

    THROW 50001, 'GPA must not be NULL.', 1;

ELSE

    BEGIN TRY

        INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
        VALUES (3, 'Nada Sami', 21, 'nada@example.com', @GPA);

    END TRY

    BEGIN CATCH

        PRINT 'Error: ' + ERROR_MESSAGE();

    END CATCH
```

5. Catch an error and log its number, line, and message

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

    VALUES (1, 'Duplicate Again', 18, 'dup@example.com', 3.0);

END TRY

BEGIN CATCH

    PRINT 'Error Number: ' + CAST(ERROR_NUMBER() AS NVARCHAR);

    PRINT 'Line: ' + CAST(ERROR_LINE() AS NVARCHAR);

    PRINT 'Message: ' + ERROR_MESSAGE();

END CATCH
```

6. Use @@ERROR to detect error in insert (legacy style)

```
INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

VALUES (1, 'Legacy Insert', 19, 'legacy@example.com', 3.1);

IF @@ERROR <> 0

    PRINT 'Error detected using @@ERROR.';

ELSE

    PRINT 'Insert successful.';
```

7. Nested TRY...CATCH to catch error at two levels

```
BEGIN TRY

    BEGIN TRY

        INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

        VALUES (1, 'Nested Test', 20, 'nested@example.com', 3.4);

    END TRY

    BEGIN CATCH

        PRINT 'Inner CATCH: ' + ERROR_MESSAGE();

        THROW;

    END CATCH

END TRY

BEGIN CATCH

    PRINT 'Outer CATCH: ' + ERROR_MESSAGE();

END CATCH
```

8. Insert a record and THROW custom error manually

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

    VALUES (4, 'Business Rule', 18, 'rule@example.com', 3.7);

    THROW 50002, 'Simulated business rule failure.', 1;

END TRY

BEGIN CATCH

    PRINT 'Custom error: ' + ERROR_MESSAGE();

END CATCH
```

```
END CATCH
```

9. Prevent duplicate email with manual check + THROW

```
IF EXISTS (SELECT 1 FROM Students WHERE Email = 'rule@example.com')
    THROW 50003, 'Email already exists.', 1;
ELSE
BEGIN TRY
    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (5, 'Check Email', 22, 'rule@example.com', 3.6);
END TRY
BEGIN CATCH
    PRINT ERROR_MESSAGE();
END CATCH
```

10. Catch and store error in variables for logging

```
DECLARE @ErrMsg NVARCHAR(400), @ErrNum INT;

BEGIN TRY
    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (1, 'Log Vars', 17, 'log@example.com', 3.2);
END TRY
BEGIN CATCH
    SET @ErrMsg = ERROR_MESSAGE();
    SET @ErrNum = ERROR_NUMBER();
    PRINT 'Stored Error: ' + CAST(@ErrNum AS NVARCHAR) + ' - ' + @ErrMsg;
END CATCH
```

11. Insert with invalid data type for GPA

```
BEGIN TRY
    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (6, 'Type Error', 20, 'typeerror@example.com', 'invalid');
END TRY
BEGIN CATCH
    PRINT 'Data type error: ' + ERROR_MESSAGE();
END CATCH
```

12. Insert NULL into NOT NULL column (FullName)

```
BEGIN TRY
    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (7, NULL, 18, 'nullname@example.com', 3.1);
END TRY
BEGIN CATCH
    PRINT 'Null value not allowed: ' + ERROR_MESSAGE();
END CATCH
```

13. Insert valid row then deliberately THROW a custom error

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

    VALUES (8, 'Post Insert Fail', 19, 'postfail@example.com', 3.2);

    THROW 50010, 'Something went wrong after the insert.', 1;

END TRY

BEGIN CATCH

    PRINT 'Caught error: ' + ERROR_MESSAGE();

END CATCH
```

14. Attempt to insert duplicate Email

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

    VALUES (9, 'Email Duplication', 22, 'rule@example.com', 3.0);

END TRY

BEGIN CATCH

    PRINT 'Duplicate email error: ' + ERROR_MESSAGE();

END CATCH
```

15. Deliberately THROW error without other operations

```
BEGIN TRY

    THROW 50011, 'This is a manual test error.', 1;

END TRY

BEGIN CATCH

    PRINT 'Manual error caught: ' + ERROR_MESSAGE();

END CATCH
```

16. Log error to ErrorLog table

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

    VALUES (10, 'Error Logger', NULL, 'logerror@example.com', 3.3);

END TRY

BEGIN CATCH

    INSERT INTO ErrorLog (ErrorMessage, ErrorTime)

    VALUES (ERROR_MESSAGE(), GETDATE());

    PRINT 'Error logged.';

END CATCH
```

17. Insert fallback student record on failure

```
BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

    VALUES (11, NULL, 20, 'fallbackfail@example.com', 3.0);

END TRY

BEGIN CATCH
```

```

INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
VALUES (1111, 'Fallback Student', 18, 'fallback@example.com', 2.0);

PRINT 'Fallback record inserted.';

END CATCH

```

18. Retry insert once after failure

```

BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (12, 'Retry Student', 21, 'retry@example.com', 3.6);

END TRY

BEGIN CATCH

    PRINT 'First attempt failed, retrying...';

    BEGIN TRY

        INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
        VALUES (1212, 'Retry Student Backup', 21, 'retry2@example.com', 3.6);

    END TRY

    BEGIN CATCH

        PRINT 'Retry also failed: ' + ERROR_MESSAGE();

    END CATCH

END CATCH

```

19. Insert into quarantine table on failure

```

DECLARE @ID INT = 13, @Name NVARCHAR(100) = NULL, @Age INT = 20, @Email NVARCHAR(100) =
'bad@example.com', @GPA DECIMAL(3,2) = 3.3;

BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (@ID, @Name, @Age, @Email, @GPA);

END TRY

BEGIN CATCH

    INSERT INTO Quarantine_Students (StudentID, FullName, Age, Email, GPA, ErrorMessage)
    VALUES (@ID, @Name, @Age, @Email, @GPA, ERROR_MESSAGE());

    PRINT 'Inserted into quarantine for review.';

END CATCH

```

20. Skip failed insert and continue with next

```

BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)
    VALUES (14, NULL, 19, 'student14@example.com', 3.0);

END TRY

BEGIN CATCH

    PRINT 'Skipped Student 14: ' + ERROR_MESSAGE();

END CATCH

BEGIN TRY

    INSERT INTO Students (StudentID, FullName, Age, Email, GPA)

```

```
VALUES (15, 'Student Fifteen', 20, 'student15@example.com', 3.4);  
END TRY  
BEGIN CATCH  
    PRINT 'Skipped Student 15: ' + ERROR_MESSAGE();  
END CATCH
```