Fail Case 13 New Account is not Inserted into MariaDB Reasons: - incorrect DML syntax - MariaDB fails either by connection timeout or external factors MariaDB (Data Store) ILoggingService (Service Layer) ILoggingDataAccess (Data Access Layer MariaDB (Data Store) CreateAccountDataAccess (Data Access Layer) (Business Layer) (Application Layer) (Service Layer) SingleOperationRequest(CREATE : enum) : Boolean createAccountManager = new CreateAccountManager() return CreateAccountManager createAccountManager.CreateAccountInput(accountInfo : Map<String, String>) : Boolean IsValidRequest(request : String[]) : Boolean createAccountService = new CreateAccountService() return CreateAccountService createAccountService.CreateAccountRequest(accountInfo : Map<String, String>) : Boolean createAccountDataAccess = new CreateAccountDataAccess() return CreateAccountDataAccess createAccountDataAccess.lsAccountActive(username : String) : Boolean EstablishMariaDBConnection(): Boolean Query Processing: SELECT username FROM accounts WHERE username SelectAccount(searchAccountDML : String) : Boolean LIKE usernameInput False : Boolean False : Boolean Query Processing: INSERT accounts createAccountDataAccess.CreateAccount(accountInfo : Map<String, String>) : Boolean VALUES (typeInput, usernameInput, InsertAccount(createAccountDML : String) : Boolean passwordInput, emailInput, ableInput) False : Boolean userManagementLoggingService = new UserManagementLoggingService() UserManagementLoggingService() return UserManagementLoggingService LogRequest(operation : String, isSuccess : Boolean) : Boolean loggingDataAccess = new LoggingDataAccess(operation : String) LoggingDataAccess(operation : String) return LoggingDataAccess loggingDataAccess.LogAsync(Log : String[]) : Boolean EstablishMariaDBConnection(): Boolean Query Processing: INSERT accounts VALUES (timestamp, InsertLog(LogSql : String) : Boolean level, user, category, description) True : Boolean True : Boolean True : Boolean Fail Case 10a New Account already exists in MariaDB Reasons: account already exists MariaDB (Data Store) MariaDB (Data Store) ILoggingService (Service Layer) ILoggingDataAccess (Data Access Layer ¢reateAccountEntry CreateAccountDataAccess (Business Layer) (Data Access Layer) (Application Layer) (Service Layer) Single Operation Request (CREATE: enum): BooleancreateAccountManager = new CreateAccountManager() return CreateAccountManager create Account IM an ager. Create Account Input (account Info: Map < String, String >): Booleanreturn CreateAccountService create Account Service. Create Account Request (account Info: Map < String, String >): BooleancreateAccountDataAccess = new CreateAccountDataAccess() return CreateAccountDataAccess createAccountService = new CreateAccountService() createAccountDataAccess.IsAccountActive(username : String) : Boolean EstablishMariaDBConnection(): Boolean Query Processing: SELECT username FROM accounts WHERE username Select Account (search Account DML: String): BooleanLIKE usernameInput True : Boolean False : Boolean False : Boolean (Subsequent Logging Process Here) False : Boolean (Subsequent Logging Process Here) userManagementLoggingService = new UserManagementLoggingService() return UserManagementLoggingService LogRequest(operation : String, isSuccess : Boolean) : Boolean loggingDataAccess = new LoggingDataAccess(operation : String) LoggingDataAccess(operation : String) return LoggingDataAccess loggingDataAccess.LogAsync(Log : String[]) : Boolean EstablishMariaDBConnection(): Boolean Query Processing: INSERT accounts InsertLog(LogSql:String):BooleanVALUES (timestamp, level, user, category, description) True : Boolean True : Boolean True : Boolean Fail Case 10b
Could Not Process Query Reasons: - incorrect DML syntax - MariaDB fails either by connection timeout or external factors CreateAccountEntry (Application Layer) MariaDB (Data Store) ILoggingService (Service Layer) ILoggingDataAccess (Data Access Layer CreateAccountDataAccess CreateAccountService MariaDB (Business Layer) (Service Layer) (Data Access Layer) (Data Store) SingleOperationRequest(CREATE : enum) : Boolean createAccountManager = new CreateAccountManager() return CreateAccountManager create Account Manager. Create Account Input (account Info: Map < String, String >): BooleanIsValidRequest(request : String[]) : Boolean createAccountService = new CreateAccountService() return CreateAccountService createAccountService.CreateAccountRequest(accountInfo : Map<String, String>) : Boolean createAccountDataAccess = new CreateAccountDataAccess() return CreateAccountDataAccess createAccountDataAccess.IsAccountActive(username : String) : Boolean EstablishMariaDBConnection(): Boolean Query Processing: SELECT username FROM accounts WHERE username SelectAccount(searchAccountDML : String) : Boolean LIKE usernameInput Error : String Error : String False : Boolean False : Boolean **NOTE**: **True** is the fail safe default so a malicious user does not exploit the False value (Subsequent Logging Process Here) False : Boolean NOTE: True is the fail safe default so a raise : boolean (Subsequent Logging Process Here) **≪----**malicious user does not exploit the False value also we can't represent a database error in a also we can't represent a database error in a binary result binary result userManagementLoggingService = new UserManagementLoggingService() UserManagementLoggingService() return UserManagementLoggingService LogRequest(operation : String, isSuccess : Boolean) : Boolean loggingDataAccess = new LoggingDataAccess(operation : String) LoggingDataAccess(operation : String) return LoggingDataAccess loggingDataAccess.LogAsync(Log : String[]) : Boolean EstablishMariaDBConnection(): Boolean Query Processing: INSERT accounts InsertLog(LogSql : String) : Boolean VALUES (timestamp, level, user, category, description) True : Boolean True : Boolean True : Boolean Fail Case 9 MariaDB Connection could not be Established Reasons: - EstablishMariaDBConnection() returns False
-- NOTE: continue to call this method until True
if still no connection after 5 seconds, log the error and end the process CreateAccountService (Service Layer) MariaDB (Data Store) ILoggingDataAccess (Data Access Layer ILoggingService (Service Layer) CreateAccountEntry (Application Layer) CreateAccountDataAccess
(Data Access Layer) MariaDB (Data Store) SingleOperationRequest(CREATE : enum) : Boolean createAccountManager = new CreateAccountManager() return CreateAccountManager createAccountManager.CreateAccountInput(accountInfo : Map<String, String>) : Boolean IsValidRequest(request : String[]) : Boolean createAccountService = new CreateAccountService() return CreateAccountService create Account Service. Create Account Request (account Info: Map < String, String >): BooleancreateAccountDataAccess = new CreateAccountDataAccess() return CreateAccountDataAccess createAccountDataAccess.lsAccountActive(username : String) : Boolean EstablishMariaDBConnection(): Boolean False : Boolean (Appropriate Logging Process Here) False : Boolean False : Boolean False : Boolean (Subsequent Logging Process Here) (Subsequent Logging Process Here) userManagementLoggingService = new UserManagementLoggingService() ☐ UserManagementLoggingService() return UserManagementLoggingService LogRequest(operation : String, isSuccess : Boolean) : Boolean loggingDataAccess = new LoggingDataAccess(operation : String) LoggingDataAccess(operation : String) return LoggingDataAccess loggingDataAccess.LogAsync(Log : String[]) : Boolean EstablishMariaDBConnection(): Boolean Query Processing: INSERT accounts InsertLog(LogSql : String) : Boolean VALUES (timestamp, level, category, description) True : Boolean True : Boolean True : Boolean Fail Case 4 Invalid Request Reasons: - Inputs do not follow their respective regex - Missing required input(s) or does not match the inputs required for request ILoggingDataAccess (Data Access Layer MariaDB (Data Store) CreateAccountDataAccess MariaDB (Data Store) ILoggingService (Service Layer) CreateAccountService (Data Access Layer) (Application Layer) (Business Layer) (Service Layer) SingleOperationRequest(CREATE : enum) : Boolean createAccountManager = new CreateAccountManager() return CreateAccountManager createAccountManager.CreateAccountInput(accountInfo : Map<String, String>) : Boolean

IsValidRequest(request : String[]) : Boolean False : Boolean (Subsequent Logging Process Here) False : Boolean (Subsequent Logging Process Here) userManagementLoggingService = new UserManagementLoggingService() UserManagementLoggingService() return UserManagementLoggingService LogRequest(operation : String, isSuccess : Boolean) : Boolean loggingDataAccess = new LoggingDataAccess(operation : String) LoggingDataAccess(operation : String) return LoggingDataAccess loggingDataAccess.LogAsync(Log : String[]) : Boolean EstablishMariaDBConnection(): Boolean Query Processing: INSERT accounts VALUES (timestamp, InsertLog(LogSql : String) : Boolean True : Boolean True: Boolean True : Boolean

FAILURE CASE DIAGRAMS w/ Logging