Table1 The original class Database in ApacheHSQLDB

| Original Class   Database | |
|---|---|
| Attributes | Methods |
| sqlEnforceStrictSize | checkColumnIsInView(String, String) |
| urlProperties | classLoader |
| userManager | clearStructures() |
| CLOSEMODE_COMPACT | close(int) |
| CLOSEMODE_IMMEDIATELY | connect(String, String) |
| CLOSEMODE_NORMAL | dropIndex(Session, String, String, boolean) |
| CLOSEMODE_SCRIPT | dropTrigger(Session, String) |
| DATABASE_CLOSING | finalize() |
| DATABASE_ONLINE | findUserTableForIndex(Session, String) |
| DATABASE_OPENING | firstIdentity |
| DATABASE_SHUTDOWN | getAliasMap() |
| bIgnoreCase | getJavaName(String) |
| bReferentialIntegrity | getPath() |
| databaseID | getProperties() |
| databaseProperties | getSessionManager() |
| databaseReadOnly | getState() |
| dbState | getStateString() |
| filesInJar | getTable(Session, String) |
| filesReadOnly | getTableIndex(Table) |
| compiledStatementManager | getType() |
| hAlias | getURI() |
| logger | getUserManager() |
| sName | getUserTable(Session, String) |
| sPath | getViewsWithSequence(NumberSequence) |
| sType | getViewsWithTable(String, String) |
| sessionManager | getViewsWithView(View) |
| | isFilesInJar() |
| | isFilesReadOnly() |
| | isIgnoreCase() |
| | isReferentialIntegrity() |
| | isShutdown() |
| | linkTable(Table) |
| | nameManager |
| | open() |
| | recompileViews(String) |
| | removeExportedKeys(Table) |
| | reopen() |
| | setFilesReadOnly() |
| | setIgnoreCase(boolean) |
| | setMetaDirty(boolean) |
| | setReadOnly() |

| | setReferentialIntegrity(boolean) |
| | setState(int) |

Table2 The new classes extracted by developers

| Class Extracted by the Developers - 1 | |
| --- | --- |
| Attributes | Methods |
| firstIdentity | open() |
| bIgnoreCase | reopen() |
| bReferentialIntegrity | clearStructures() |
| databaseProperties | getType() |
| hAlias | getPath() |
| userManager | getProperties() |
| nameManager | getSessionManager() |
| sessionManager | isShutdown() |
| compiledStatementManager | connect(String username, String password) |
| DATABASE_ONLINE | setReadOnly() |
| DATABASE_OPENING | setFilesReadOnly() |
| DATABASE_CLOSING | isFilesReadOnly() |
| DATABASE_SHUTDOWN | isFilesInJar() |
| CLOSEMODE_IMMEDIATELY | getUserManager() |
| CLOSEMODE_NORMAL | setReferentialIntegrity(ref) |
| CLOSEMODE_COMPACT | isReferentialIntegrity() |
| CLOSEMODE_SCRIPT | getAliasMap() |
| databaseID | getJavaName(String s) |
| sType | setIgnoreCase(b) |
| sName | isIgnoreCase() |
| urlProperties | finalize() |
| sPath | close(closemode) |
| classLoader | setMetaDirty(resetPrepared) |
| dbState | setState(state) |
| logger | getState() |
| databaseReadOnly | getStateString() |
| filesReadOnly | getURI() |
| filesInJar | |
| sqlEnforceStrictSize | |
| Class Extracted by the Developers - 2 | |
| Attributes | Methods |
| Variables | getTable(Session, String) |
| | getUserTable(Session, String) |
| | linkTable(Table t) |
| | findUserTableForIndex(Session, String) |
| | getTableIndex(Table) |
| | dropIndex(Session, String, StringName, boolean) |
| | checkColumnIsInView(String, String) |
| | getViewsWithView(View) |

| | getViewsWithTable(String, String) |
| --- | --- |
| | getViewsWithSequence(NumberSequence) |
| | recompileViews(String) |
| | removeExportedKeys(Table) |
| | dropTrigger(Session, String) |

Table3 The new classes extracted by our approach

| Class Extracted our approach - 1 | |
| --- | --- |
| Attributes | Methods |
| firstIdentity | open() |
| bIgnoreCase | reopen() |
| bReferentialIntegrity | clearStructures() |
| databaseProperties | getType() |
| hAlias | getPath() |
| userManager | getProperties() |
| nameManager | getSessionManager() |
| sessionManager | isShutdown() |
| compiledStatementManager | connect(String username, String password) |
| DATABASE_ONLINE | setReadOnly() |
| DATABASE_OPENING | setFilesReadOnly() |
| DATABASE_CLOSING | isFilesReadOnly() |
| DATABASE_SHUTDOWN | isFilesInJar() |
| CLOSEMODE_IMMEDIATELY | getUserManager() |
| CLOSEMODE_NORMAL | setReferentialIntegrity(ref) |
| CLOSEMODE_COMPACT | isReferentialIntegrity() |
| CLOSEMODE_SCRIPT | getAliasMap() |
| databaseID | getJavaName(String s) |
| sType | setIgnoreCase(b) |
| sName | isIgnoreCase() |
| urlProperties | finalize() |
| sPath | close(closemode) |
| classLoader | setMetaDirty(resetPrepared) |
| dbState | setState(state) |
| logger | getState() |
| databaseReadOnly | getStateString() |
| filesReadOnly | getURI() |
| filesInJar | |
| sqlEnforceStrictSize | |
| Class Extracted our approach - 2 | |
| Attributes | Methods |
| Variables | getTable(Session, String) |
| | getUserTable(Session, String) |
| | linkTable(Table t) |
| | findUserTableForIndex(Session, String) |

| | getTableIndex(Table) |
|---|---|
| | dropIndex(Session, String, StringName, boolean) |
| | checkColumnIsInView(String, String) |
| | getViewsWithView(View) |
| | getViewsWithTable(String, String) |
| | getViewsWithSequence(NumberSequence) |
| | recompileViews(String) |
| | removeExportedKeys(Table) |
| | dropTrigger(Session, String) |

Table 4 The new classes extracted by Bavota's approach[14]

| Class Extracted Bavota's approach - 1 | |
|---|---|
| Attributes | Methods |
| | checkColumnIsInView(String, String) |
| | connect(String, String) |
| | dropIndex(Session, String, String, boolean) |
| | dropTrigger(Session, String) |
| | finalize() |
| | findUserTableForIndex(Session, String) |
| | getAliasMap() |
| | getJavaName(String) |
| | getPath() |
| | getProperties() |
| | getSessionManager() |
| | getState() |
| | getStateString() |
| | getTable(Session, String) |
| | getTableIndex(Table) |
| | getType() |
| | getURI() |
| | getUserManager() |
| | getUserTable(Session, String) |
| | isFilesInJar() |
| | isFilesReadOnly() |
| | isIgnoreCase() |
| | isReferentialIntegrity() |
| | linkTable(Table) |
| | recompileViews(String) |
| | removeExportedKeys(Table) |
| | setFilesReadOnly() |
| | setIgnoreCase(boolean) |
| | setMetaDirty(boolean) |
| | setReadOnly() |
| | setReferentialIntegrity(boolean) |

| | setState(int) |
|---|---|
| | close(int) |
| | open() |
| Class Extracted Bavota's approach - 2 | |
| Attributes | Methods |
| CLOSEMODE_COMPACT | getViewsWithTable(String, String) |
| DATABASE_ONLINE | getViewsWithSequence(NumberSequence) |
| DATABASE_CLOSING | getViewsWithView(View) |
| nameManager | clearStructures() |
| hAlias | reopen() |
| CLOSEMODE_IMMEDIATELY | isShutdown() |
| DATABASE_OPENING | |
| CLOSEMODE_SCRIPT | |
| CLOSEMODE_NORMAL | |
| DATABASE_SHUTDOWN | |
| databaseID | |
| databaseProperties | |
| sqlEnforceStrictSize | |
| firstIdentity | |
| sName | |
| sType | |
| sPath | |
| urlProperties | |
| filesInJar | |
| classLoader | |
| userManager | |
| logger | |
| sessionManager | |
| filesReadOnly | |
| databaseReadOnly | |
| compiledStatementManager | |
| bIgnoreCase | |
| bReferentialIntegrity | |
| Variables | |

Table 5 The new classes extracted by Fokaefs' approach

| Class Extracted Fokaefs' approach - 1 | |
|---|---|
| Attributes | Methods |
| CLOSEMODE_COMPACT | getStateString() |
| DATABASE_ONLINE | open() |
| DATABASE_CLOSING | isShutdown() |
| hAlias | dbState |
| CLOSEMODE_IMMEDIATELY | getState() |
| DATABASE_OPENING | setState(int) |

| | |
|---|---|
| CLOSEMODE_SCRIPT | finalize() |
| CLOSEMODE_NORMAL | getJavaName(String) |
| DATABASE_SHUTDOWN | getAliasMap() |
| databaseID | getProperties() |
| databaseProperties | sqlEnforceStrictSize |
| sName | firstIdentity |
| sType | getURI() |
| sPath | getType() |
| urlProperties | getPath() |
| filesInJar | isFilesInJar() |
| classLoader | getUserManager() |
| userManager | getSessionManager() |
| logger | connect(String, String) |
| sessionManager | close(int) |
| filesReadOnly | setReadOnly() |
| bIgnoreCase | setFilesReadOnly() |
| bReferentialIntegrity | isFilesReadOnly() |
| Variables | databaseReadOnly |
| | compiledStatementManager |
| | setMetaDirty(boolean) |
| | isIgnoreCase() |
| | setIgnoreCase(boolean) |
| | setReferentialIntegrity(boolean) |
| | isReferentialIntegrity() |

| Class Extracted Fokaefs' approach - 2 | |
|---|---|
| Attributes | Methods |
| nameManager | getUserTable(Session, String) |
| | dropIndex(Session, String, String, boolean) |
| | checkColumnIsInView(String, String) |
| | recompileViews(String) |
| | dropTrigger(Session, String) |
| | findUserTableForIndex(Session, String) |
| | reopen() |
| | clearStructures() |
| | removeExportedKeys(Table) |
| | getViewsWithView(View) |
| | getViewsWithTable(String, String) |
| | getViewsWithSequence(NumberSequence) |
| | getTableIndex(Table) |
| | getTable(Session, String) |
| | linkTable(Table) |