CS562 Final Project
—final war

ImaginDragons

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what we're about to present

-Project Overview

-Project Structure & User Interface

-HighLights

-Limitations and Future Work

Project Overview

1. **Problem:** Build a query processing engine for the MF queries because traditional optimizers lead to poor performance.

2. **Solution:** The project introduces the Φ operator, and scan each tuple for each grouping attributes instead of using joins

3. **Technology We Are Using**

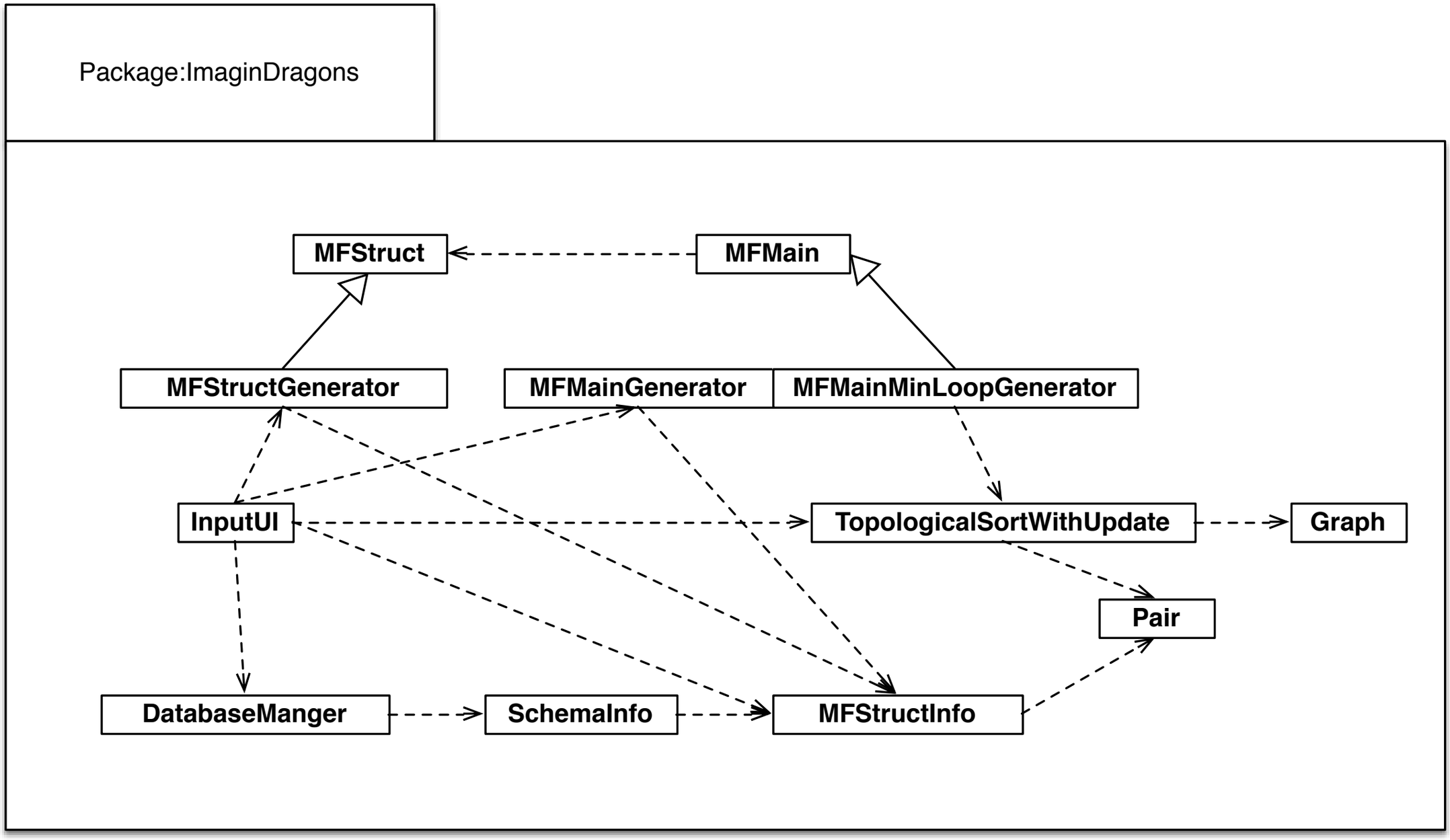
- **Language:** Java
- **DBMS:** PostgreSQL
- **Library:** PostgreSQL Java Library

4. HighLights

- Check if select clause is valid? ““: selectAttr
- Generate Minimum Loop using revised topological sort
- Can check whether a particular condition is valid

(ex. if avg_1_quant is not created for some group, then this group should not ignored for 2.quant > avg_1_quant)

Project Structure



InputUI – – Yujie

DatabaseManager dm
List of JFrame variables
…

initUI()
test() //initialized test data
initPanelNW()
initPanelNE()
initPanelSW()
initPanelSE()
addListeners()
stageChanged()
setTextAreaSE()
main() //Entry of the whole project

Graph – – Yujie

```
HashSet<Integer>[] adj
HashSet<Integer> end
HashSet<Integer> allSet
```

addEdge()
adj()
start()

DatabaseManager – – Chuanhui

String usr
String pwd
String url

connect()
retrieve()
importData()
getters()
...

SchemaInfo – – Yujie

table_name
TypeMap

getTableName()
addAttribute()
getValue()
getSchema()
schemaInit()
getSchemaInfo()
updataType()

MFStructInfo – – Yujie&Chuanhui

SchemaInfo si //Instance of SchemaInfo
ArrayList<String> selAttrList //Select attributes
int numOfGv //Number of Grouping variables
ArrayList<String> gaList //Grouping attributes
ArrayList<String> afList //Aggregate functions
ArrayList<String> condList //Conditions in “such that” Clause
Map<String, String> gaNameToTypeMap
Map<String, String> afNameToTypeMap
//ex: Map<loop, HashMap<aggregate, Stack<String>>>
Map<String, HashMap<String, Stack<String>>> afCoreMap
//ex: Map<selAttr,false-left/true-right>
Map<String, Boolean> selAlignMap
//Map<selAttr, parsedSelAttrs>
Map<String, ArrayList<String>> selAttrMap
//Identifying whether a type is numeric type
HashSet<String> numTypeSet
//ex: Map<loop, ArrayList<afs>>
//Identifying whether dependency condition is valid
Map<Integer, ArrayList<String>> condMap
//Paris of condition dependencies for
//TopologicalSortWithUpdate
ArrayList<Pair> condDepPairList

analyzeGa()
analyzeAf()
analyzeCond()
analyzeSelAttr()
getters…

TopologicalSortWithUpdate – – Yujie

Graph g
int[] step
int num
boolean[] marked
Map<Integer, HashSet<Integer>> sehdule

run()
depthFirstOrder()
dfs()
update()

MFMainMinLoopGenerator	**MFMainGenerator** – – Chuanhui
String path	String path
String code	String code
String StaticStringsToOutput	String StaticStringsToOutput
…	…
MFMainMinLoopGenerator()	MFMainGenerator()
ScanMinLoopInfo()	ScanLoopInfo()
PrintOutInfo()	PrintOutInfo()
run()	run()

TopologicalSortWithUpdate – – Yujie

Graph g
int[] step
int num
boolean[] marked
Map<Integer, HashSet<Integer>> sehdule

run()
depthFirstOrder()
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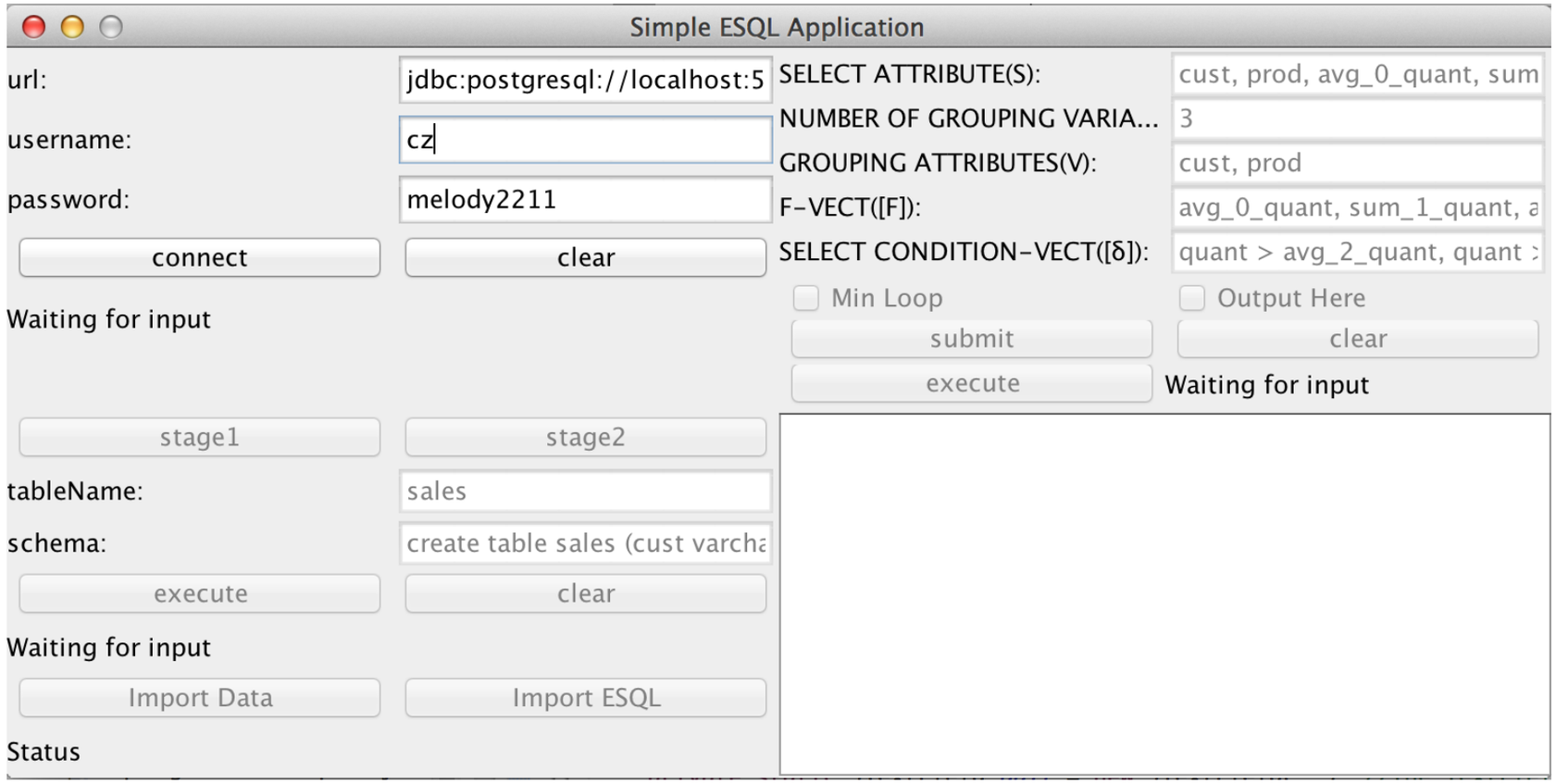
User Interface



Stage 1:

- **NW panel:** input db info (uri, usr, pwd). Other panels will unlock if successfully connect to the db.

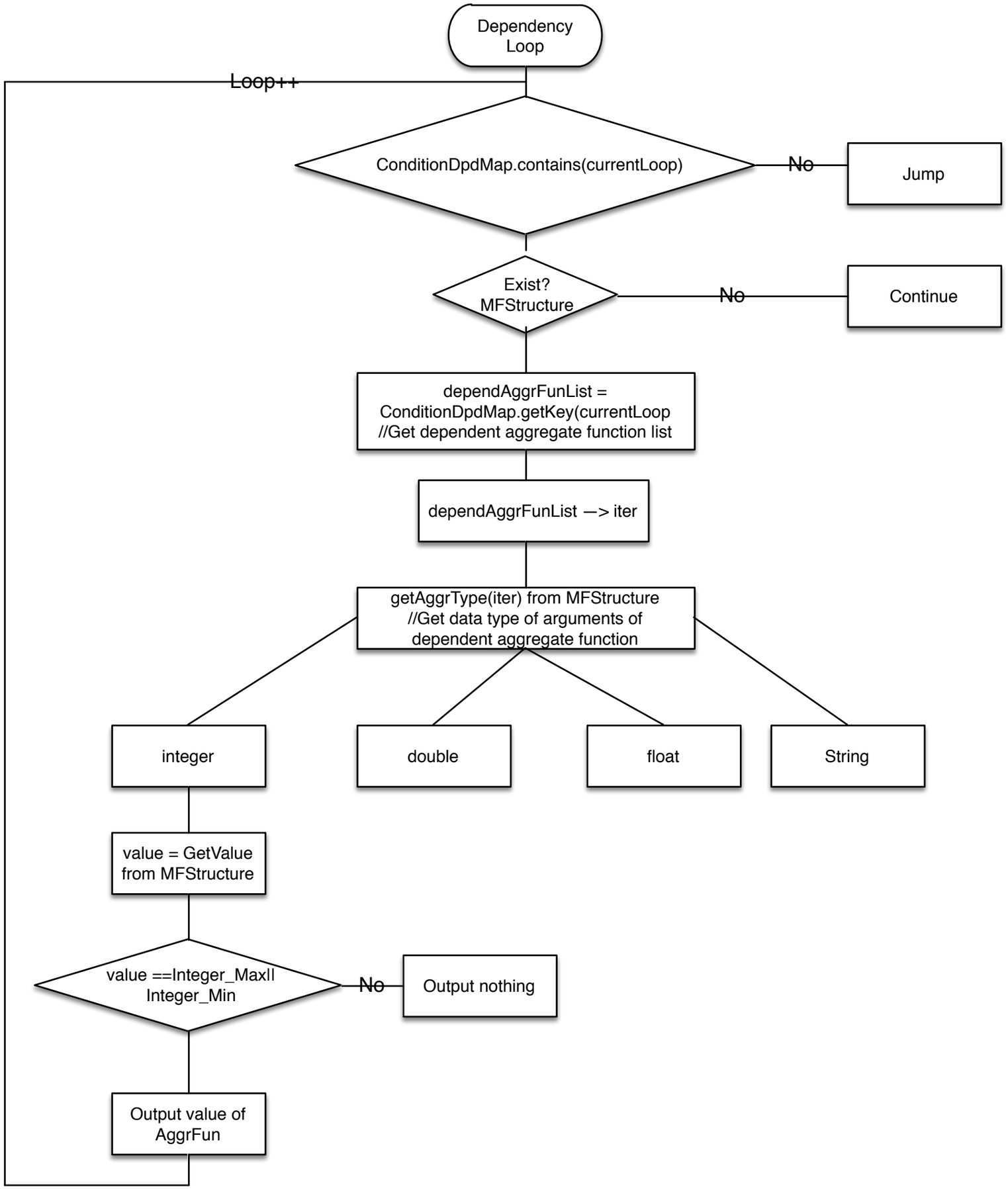
Stage 2:

- **SW panel:** db operations (create schema, import data/ESQL). You can unlock the NW panel by stage buttons.
- **NE panel:** input five Φ arguments to output MFMain.java and MFStruct.java. You can select MinLoop option.
- **SE panel:** output schema info after schema is created

HighLights

Check if certain condition is valid:

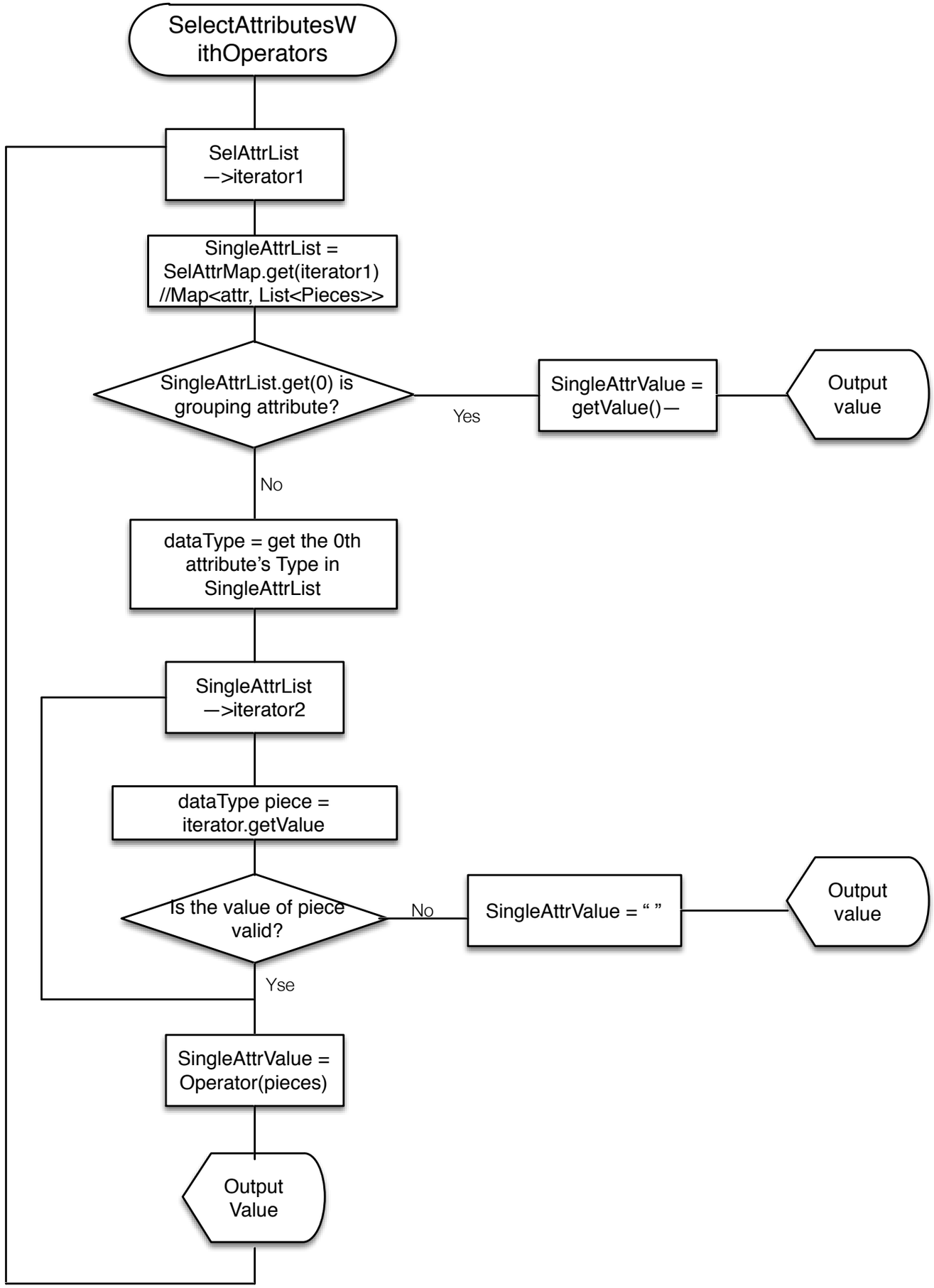
if avg_1_quant is not created for some group, then this group should not process 2.quant > avg_1_quant



HighLights(Cont'd)

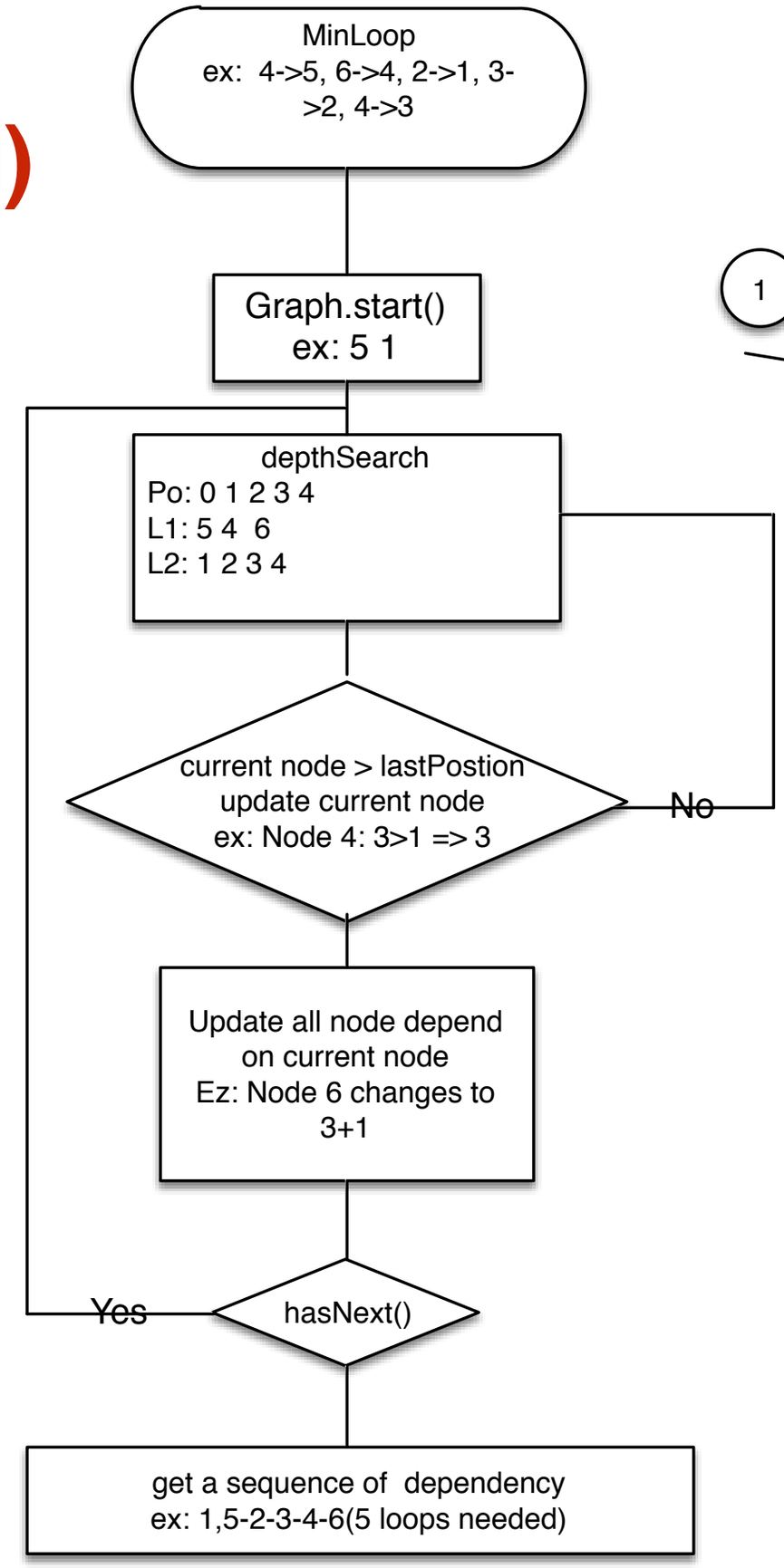
Check if Select Clause is valid especially when there are operators in it:

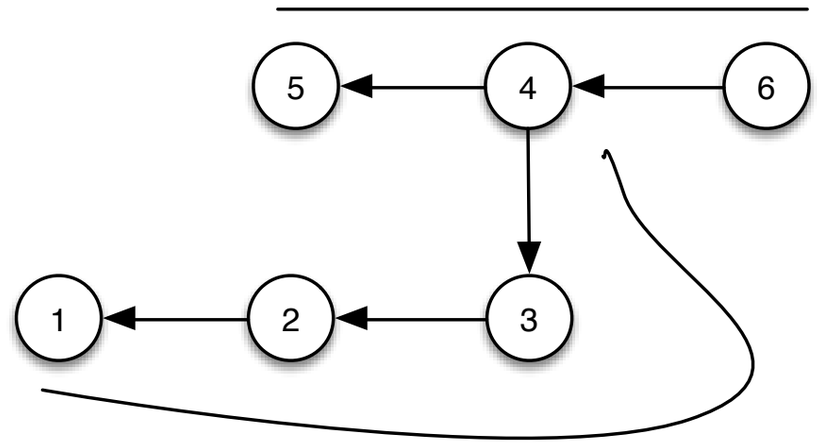
(Ex. if max_1_quant is not valid for a certain MFStruct Object, then max_1_quant + max_2_quant should output "")



HighLights(Cont'd)

Generate Minimum Loop using revised topological sort





Limitation

1. Select Clause only include “+”, “-“, “*”, “/“

2. Due to tech difficulty, User Interface cannot print the output by MFMain.java

3. No error checking for ESQL syntax

3. As a two-member team, our project only focuses on MF Queries

Future Work

1. ESQL Parser (Ongoing…)

2. User Interface prints the output by MFMain.java

3. Support for EMF Queries