**COMP-6908 Project 2**

**Database Query and B+ Tree**

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# **Description of Directory Structure:**

The directory structure can be shown as:

<Yuhao-Xiaolong>

data

Products

Suppliers

Supply

pagePool.txt

schemas.txt

index

directory.txt

pagePool.txt

program

buildTree.py # contains duildTree function definition

display.py

query.py

relAlg.py

remove.py

TreeNode.py # contains B+ tree node class, and insert, search, split node methods definition

queryOutput

treePic

# **Screenshots for the output that shows the IO costs from those queries:**

Query A:

Query B:

Query C:

Query D:

Query E:

# **Printout of the files where the B+\_trees are displayed:**

**B+ Tree on Suppliers.sid, order = 2:**

pg80.txt: ["I", "nil", ["pg92.txt", "s10", "pg81.txt"]]

pg92.txt: ["I", "pg80.txt", ["pg97.txt", "s04", "pg94.txt"]]

pg97.txt: ["I", "pg92.txt", ["pg99.txt", "s02", "pg98.txt"]]

pg99.txt: ["L", "pg97.txt", "nil", "pg98.txt", ["s01", ["page00.txt.0"]]]

pg98.txt: ["L", "pg97.txt", "pg99.txt", "pg96.txt", ["s02", ["page00.txt.1"], "s03", ["page01.txt.0"]]]

pg94.txt: ["I", "pg92.txt", ["pg96.txt", "s06", "pg95.txt", "s08", "pg91.txt"]]

pg96.txt: ["L", "pg94.txt", "pg98.txt", "pg95.txt", ["s04", ["page01.txt.1"], "s05", ["page02.txt.0"]]]

pg95.txt: ["L", "pg94.txt", "pg96.txt", "pg91.txt", ["s06", ["page02.txt.1"], "s07", ["page03.txt.0"]]]

pg91.txt: ["L", "pg94.txt", "pg95.txt", "pg90.txt", ["s08", ["page03.txt.1"], "s09", ["page04.txt.0"]]]

pg81.txt: ["I", "pg80.txt", ["pg87.txt", "s16", "pg83.txt"]]

pg87.txt: ["I", "pg81.txt", ["pg90.txt", "s12", "pg89.txt", "s14", "pg88.txt"]]

pg90.txt: ["L", "pg87.txt", "pg91.txt", "pg89.txt", ["s10", ["page04.txt.1"], "s11", ["page05.txt.0"]]]

pg89.txt: ["L", "pg87.txt", "pg90.txt", "pg88.txt", ["s12", ["page05.txt.1"], "s13", ["page06.txt.0"]]]

pg88.txt: ["L", "pg87.txt", "pg89.txt", "pg86.txt", ["s14", ["page06.txt.1"], "s15", ["page07.txt.0"]]]

pg83.txt: ["I", "pg81.txt", ["pg86.txt", "s18", "pg85.txt", "s20", "pg84.txt", "s22", "pg79.txt", "s24", "pg78.txt"]]

pg86.txt: ["L", "pg83.txt", "pg88.txt", "pg85.txt", ["s16", ["page07.txt.1"], "s17", ["page08.txt.0"]]]

pg85.txt: ["L", "pg83.txt", "pg86.txt", "pg84.txt", ["s18", ["page08.txt.1"], "s19", ["page09.txt.0"]]]

pg84.txt: ["L", "pg83.txt", "pg85.txt", "pg79.txt", ["s20", ["page09.txt.1"], "s21", ["page10.txt.0"]]]

pg79.txt: ["L", "pg83.txt", "pg84.txt", "pg78.txt", ["s22", ["page10.txt.1"], "s23", ["page11.txt.0"]]]

pg78.txt: ["L", "pg83.txt", "pg79.txt", "nil", ["s24", ["page11.txt.1"], "s25", ["page12.txt.0"], "s26", ["page12.txt.1"]]]

**B+ Tree on Supply.pid, order = 2:**

pg71.txt: ["I", "nil", ["pg75.txt", "p13", "pg66.txt", "p23", "pg72.txt"]]

pg75.txt: ["I", "pg71.txt", ["pg77.txt", "p03", "pg69.txt", "p05", "pg65.txt", "p07", "pg64.txt", "p10", "pg73.txt"]]

pg77.txt: ["L", "pg75.txt", "nil", "pg69.txt", ["p01", ["page10.txt.1", "page20.txt.0", "page26.txt.1", "page27.txt.0", "page43.txt.0", "page47.txt.0"],

"p02", ["page11.txt.1", "page16.txt.0", "page34.txt.0", "page41.txt.0"]]]

pg69.txt: ["L", "pg75.txt", "pg77.txt", "pg65.txt", ["p03", ["page04.txt.1", "page09.txt.1", "page29.txt.1", "page31.txt.0", "page48.txt.1"],

"p04", ["page20.txt.1", "page23.txt.1", "page35.txt.0"]]]

pg65.txt: ["L", "pg75.txt", "pg69.txt", "pg64.txt", ["p05", ["page08.txt.0"],

"p06", ["page05.txt.1", "page15.txt.1", "page32.txt.1", "page51.txt.0"]]]

pg64.txt: ["L", "pg75.txt", "pg65.txt", "nil", ["p07", ["page19.txt.0", "page41.txt.1"],

"p08", ["page30.txt.0"], "p09", ["page33.txt.0", "page42.txt.0", "page49.txt.1", "page52.txt.0"]]]

pg73.txt: ["L", "pg75.txt", "pg77.txt", "pg67.txt", ["p10", ["page02.txt.0", "page21.txt.1", "page31.txt.1", "page34.txt.1", "page40.txt.0"],

"p11", ["page27.txt.1", "page39.txt.0", "page47.txt.1", "page50.txt.1"],

"p12", ["page11.txt.0", "page23.txt.0", "page26.txt.0", "page35.txt.1", "page42.txt.1", "page45.txt.1", "page49.txt.0",

"page52.txt.1"]]]

pg66.txt: ["I", "pg71.txt", ["pg67.txt", "p16", "pg70.txt", "p18", "pg68.txt"]]

pg67.txt: ["L", "pg66.txt", "pg73.txt", "nil", ["p13", ["page16.txt.1", "page19.txt.1", "page24.txt.1", "page28.txt.1", "page46.txt.1"], "p14", ["page10.txt.0"],

"p15", ["page00.txt.0", "page05.txt.0", "page08.txt.1", "page44.txt.0"]]]

pg70.txt: ["L", "pg66.txt", "pg73.txt", "pg68.txt", ["p16", ["page06.txt.0", "page24.txt.0", "page43.txt.1"], "p17", ["page07.txt.0", "page22.txt.1", "page53.txt.1"]]]

pg68.txt: ["L", "pg66.txt", "pg70.txt", "nil", ["p18", ["page01.txt.1", "page44.txt.1", "page46.txt.0"], "p19", ["page39.txt.1"],

"p20", ["page06.txt.1", "page40.txt.1", "page50.txt.0"], "p21", ["page13.txt.0", "page38.txt.1"]]]

pg72.txt: ["I", "pg71.txt", ["pg76.txt", "p27", "pg74.txt"]]

pg76.txt: ["L", "pg72.txt", "pg77.txt", "pg74.txt", ["p23", ["page00.txt.1", "page14.txt.0", "page15.txt.0", "page29.txt.0"],

"p24", ["page07.txt.1", "page18.txt.0", "page37.txt.1", "page53.txt.0"], "p25", ["page13.txt.1", "page37.txt.0"],

"p26", ["page01.txt.0", "page03.txt.0", "page25.txt.1", "page30.txt.1", "page36.txt.1", "page48.txt.0"]]]

pg74.txt: ["L", "pg72.txt", "pg76.txt", "nil", ["p27", ["page02.txt.1", "page12.txt.1", "page14.txt.1", "page17.txt.0", "page17.txt.1", "page25.txt.0", "page28.txt.0",

"page51.txt.1"],

"p28", ["page09.txt.0", "page32.txt.0", "page36.txt.0", "page38.txt.0"], "p29", ["page04.txt.0", "page12.txt.0", "page22.txt.0"],

"p30", ["page03.txt.1", "page18.txt.1", "page21.txt.0", "page33.txt.1", "page45.txt.0"]]]

# **Printout of file queryResult.txt:**