PROJECT REPORT
SIMULATION FP-GROWTH ALGORITHM
AND HASH BASED ALGORITHM

Marshel Nathanael Irawan Budiono
10.02.0038
2013/2014

FACULTY OF COMPUTER SCIENCE
SOEGIAPRANATA CATHOLIC UNIVERSITY

Jl. Pawiyatan Luhur IV/1, Bendan Duwur, SEMARANG 50234
Telp. 024-8441555 (hunting) Web: http://www.unika.ac.id
http://ikomunika.web.id/
APPROVAL AND RATIFICATION PAGE

PROJECT REPORT

SIMULATION FP-GROWTH ALGORITHM

AND

HASH BASED ALGORITHM

by

10.02.0038 – Marshel Nathanael Irawan Budiono

This project report has been approved and ratified by the Dean of Faculty of Computer Science and Supervisor on 18 July 2014

With approval,

Examiners,

Suyanto Edward Antonius, Jr., M.Sc

Hironimus Leonis Kom., M.Kom
NPP: 058.1.2007.273

Examiners,

Shinta Estri Wahyuningrum, S.Si, M.Cs
NPP: 058.1.2007.272

Rosita Herawati, ST., MIT
NPP: 058.1.2004.263

Dean of Faculty of Computer Science,

Hironimus Leonis Kom., M.Kom
NPP: 058.1.2007.273
STATEMENT OF ORIGINALITY

I, the undersigned:

Name : Marshel Nathanael Irawan Budiono
ID : 10.02.0038

Certify that this project was made by myself and not copy or plagiarize from other people, except that in writing expressed to the other article. If it is proven that this project was plagiarizes or copy the other, I am ready to accept a sanction.

Semarang, 18 July 2014

[Signature]

Marshel Nathanael Irawan Budiono

10.02.0038
ABSTRACT

FP-Growth Algorithm and Hash Based Algorithm is subgroup from Association Rule Algorithm, where the function is for determine the data association or Itemset which often appear concurrently in the data collection. The different between FP-Growth Algorithm and Hash Based Algorithm is the process of algorithm completion, where FP-Growth Algorithm use Tree and Hash Based Algorithm use Hash Table.

FP-Growth Algorithm in application contains 2 iteration, where in first iteration select items that have frequent more than min support value. And next step is order items in transaction. Then show FP-Tree Simulation, after that FP-Growth Algorithm began selecting items that frequently appear together with the use of FP-Tree. And from the process can get the result. Hash Based Algorithm contains 3 iteration, where in first iteration select items that have frequent more than min support value. Second iteration is input Itemset 2 Item to the Hash Table based on Hash Bucket Formula and selection Itemset 2 Item that have frequent more than min support value. The third iteration is show Itemset 3 Item that have frequent more than min support value.

This application aims to help users in the process of completion of the FP-Growth Algorithm and Hash Based Algorithm, both in time optimization and process optimization. Other than that this application can help the user in learning FP-Growth Algorithm and Hash Based Algorithm, because in this application there is also explanation of the steps of the program.

Keywords: Hash Based Algorithm, FP-Growth Algorithm, FP-Tree, Hash Bucket Formula
FOREWORD

I would like to say great thank you to My Jesus Christ for His Wisdom and His Big Ideas that make me able to complete this Project with title "Simulation FP-Growth Algorithm and Hash Based Algorithm" and always provides a way out in every obstacle I faced in preparing this project. Then I would thank to:

• My parent Wignyo Budiono and Sri Rahayu, My brother Daniel Immanuel KB, and My Sister Alicia Vania TB always gave me support, prayer and spirit.
• All of my Lectures in IKOM UNIKA that has guided me, giving knowledge, and provided input.
• My girlfriend Alenia Masik always gave me support, prayer and spirit.
• All of my Friends in IKOM UNIKA that has helped me and giving me support while i study in IKOM UNIKA both in lessons and in daily activities.
• and every one that has contributed through the website reference, reference journals, and reference code in the preparation of this project.

Finally I would thank you for IKOM UNIKA. A lot of memories that can not be forgotten as long as I learned here, I hope IKOM UNIKA more advanced again in every time. Good luck to the entire family of Ikom UNIKA.

Semarang, July 16th 2014

[Signature]

Marshel Nathanael IB
10.02.0038
# TABLE OF CONTENT

Approval and Ratification Page .................................................. i
Statement of Originaly .............................................................. ii
Abstract ..................................................................................... iii
Foreword .................................................................................... iv
Table of Content ........................................................................ v
Table of Picture ........................................................................ vii
Table of Tables ........................................................................... ix
Chapter I Introduction ................................................................ 1
  1.1 Background ......................................................................... 1
  1.2 Scope .................................................................................. 2
  1.3 Objective ............................................................................ 2
Chapter II Literature Study ......................................................... 3
  2.1 FP-Growth Algorithm ......................................................... 3
  2.2 Hash Based Algorithm ....................................................... 6
Chapter III Planning ................................................................... 9
  3.1 Methodology ....................................................................... 9
  3.2 Project Management .......................................................... 10
Chapter IV Analysis and Design ................................................. 11
  4.1 Analysis ............................................................................. 11
    4.1.1 Use Case Diagram ....................................................... 11
    4.1.2 Class Diagram GUI .................................................... 12
  4.2 Design and Feature ............................................................. 14
    4.2.1 Feature ....................................................................... 14
    4.2.2 Design ...................................................................... 15
Chapter V Implementation and Testing ....................................... 19
  5.1 Implementation ................................................................... 19
    5.1.1 Java Code ................................................................. 19
<table>
<thead>
<tr>
<th>Picture</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>FP-Tree Transaction T100</td>
<td>5</td>
</tr>
<tr>
<td>2.2</td>
<td>FP-Tree Transaction T200</td>
<td>5</td>
</tr>
<tr>
<td>2.3</td>
<td>FP-Tree All Transaction</td>
<td>5</td>
</tr>
<tr>
<td>2.4</td>
<td>FP-Tree Line End in A5</td>
<td>6</td>
</tr>
<tr>
<td>2.5</td>
<td>FP-Tree Line End in A4</td>
<td>6</td>
</tr>
<tr>
<td>2.6</td>
<td>FP-Tree Line End in A3</td>
<td>6</td>
</tr>
<tr>
<td>4.1</td>
<td>Use Case Diagram</td>
<td>11</td>
</tr>
<tr>
<td>4.2</td>
<td>Class Diagram GUI</td>
<td>13</td>
</tr>
<tr>
<td>4.3</td>
<td>Simulator Design</td>
<td>16</td>
</tr>
<tr>
<td>4.4</td>
<td>Input Page Design</td>
<td>16</td>
</tr>
<tr>
<td>4.5</td>
<td>View Page Design</td>
<td>17</td>
</tr>
<tr>
<td>4.6</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>4.7</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>4.8</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>5.1</td>
<td>Simulator Page</td>
<td>23</td>
</tr>
<tr>
<td>5.2</td>
<td>Input Page</td>
<td>23</td>
</tr>
<tr>
<td>5.3</td>
<td>View Page</td>
<td>24</td>
</tr>
<tr>
<td>5.4</td>
<td>Table Item</td>
<td>25</td>
</tr>
<tr>
<td>5.5</td>
<td>First Iteration</td>
<td>25</td>
</tr>
<tr>
<td>5.6</td>
<td>FP-Tree Simulation</td>
<td>25</td>
</tr>
<tr>
<td>5.7</td>
<td>FP-Tree End Line in A5</td>
<td>26</td>
</tr>
<tr>
<td>5.8</td>
<td>FP-Tree End Line in A4</td>
<td>26</td>
</tr>
<tr>
<td>5.9</td>
<td>FP-Tree End Line in A3</td>
<td>26</td>
</tr>
<tr>
<td>5.10</td>
<td>FP-Tree End Line in A1</td>
<td>26</td>
</tr>
<tr>
<td>5.11</td>
<td>Result FP-Growth Algorithm</td>
<td>27</td>
</tr>
<tr>
<td>5.12</td>
<td>Table Item</td>
<td>28</td>
</tr>
<tr>
<td>5.13</td>
<td>First Iteration</td>
<td>28</td>
</tr>
</tbody>
</table>
TABLE OF TABLES

Table 2.1 Data Transaction ......................................................... 3
Table 2.2 Frequent each Item ....................................................... 4
Table 2.3 Order Frequent Item ..................................................... 4
Table 2.4 Data Transaction Order .................................................. 4
Table 2.5 Data C1 .................................................................. 7
Table 2.6 Data L1 .................................................................. 7
Table 2.7 Hash Bucket Formula .................................................. 7
Table 2.8 Hash Table ................................................................ 8
Table 2.9 Data L3 .................................................................. 8
Table 3.1 Project Management Schedule .................................... 10