Understanding Graph Data Base Systems Using [Java/JI Prolog] – A Simple Suggestion to Implement [AI/IoT/HPC/BIG DATA] Informatics Systems.

[Researching Algorithms for Next Generation Bio-informatics Platforms]

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[I] Simple Abstract :

JI Prolog+Neo4j+JikesRVM-Research Virtual Machine/JVM-Java Virtual Machine/IoT/HPC Heterogeneous Environments in the Context of BIG DATA Analytics based on Bio-informatics.Exploring Graph Data Base Systems Using Java for Next Generation Bio-informatics Frameworks Using IoT/HPC Systems.We are testing the above mentioned informatics frameworks using RVM – Research Virtual Machine – a highly experimental TESTBED.Since Java is well suited for IoT/HPC– Heterogeneous Environments and its associated challenges,we are presenting here,a simple challenging Informatics Framework to probe next generation Bio-informatics R&D.

index words/key words : already mentioned in the Abstract itself.

[II] Inspiration +Introduction :

"**Graph databases** help to unify master **data**, such as information about customers, products, suppliers, and logistics. Neo4j allows you to organize master **data** and model it in a **graph**, revealing connections and relationships. Neo4j can provide important insights so that you can make relevant business decisions. Building an email targeting **system** with Neo4j ." – [Source – *https://rubygarage.org/blog/neo4j-**database**-guide-with-use-cases*]
[Source – https://en.wikipedia.org/wiki/Neo4j]

"**Cypher** was largely an invention of Andrés Taylor while working for Neo4j, Inc. (formerly Neo Technology) in 2011.[2] Cypher was originally intended to be used with the graph database Neo4j, but was opened up through the openCypher project in October 2015.[3] " [Source – Please See the reference mentioned]

Graph Data Base – "In computing, a graph database (GDB) is a database that uses graph structures for semantic queries with nodes, edges, and properties to represent and store data. A key concept of the system is the graph (or edge or relationship). The graph relates the data items in the store to a collection of nodes and edges, the edges representing the relationships between the nodes. The relationships allow data in the store to be linked together directly and, in many cases, retrieved with one operation. Graph databases hold the relationships between data as a priority. Querying relationships within a graph database is fast because they are perpetually stored within the database itself. Relationships can be intuitively visualized using graph databases, making them useful for heavily inter-connected data."
[Source – *https://**en.wikipedia.org**/wiki/**Graph_database***]

Java Programming Language –"Java is a general-purpose programming language that is class-based, object-oriented, and designed to have as few implementation dependencies as possible. It is intended to let application developers write once, run anywhere, meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. Java applications are typically compiled to bytecode that can run on any Java virtual machine regardless of the underlying computer architecture." [Source – Please See the reference mentioned]

JikesRVM/JVM –"Jikes Research Virtual Machine is a mature virtual machine that runs programs written for the Java platform. Unlike most other Java virtual machines, it is written in the programming language Java, in a style of implementation termed meta-circular. It is free and open source software released under an Eclipse Public License."
[Source – Please See the reference mentioned]

JI Prolog – Java Prolog Tool – "JIProlog integrates **Prolog** and Java languages in a very fascinating way. It allows calling **Prolog** predicates from Java without dealing with native code (JNI) and allows invoking Java methods from **Prolog** as they were predicates." [Source – Please See the reference mentioned]

IoT/AoT/HPC Systems – "The Internet of Things is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. "
[Source – *https://en.wikipedia.org/wiki/Internet_of_Things*]
[Source – *https://www.sap.com/india/trends/internet-of-things.html*]
[Source – *https://www.ibm.com/blogs/internet-of-things/what-is-the-iot*]

"**High-Performance Computing (HPC)** is the use of super computers and parallel processing techniques for solving complex computational problems. HPC technology focuses on developing parallel processing algorithms and systems by incorporating both administration and parallel computational techniques."
[Source – *https://www.techopedia.com/definition/4595*]

AI+ Heterogeneous Environment/s – "Heterogeneous computing refers to systems that use more than one kind of processor or cores. These systems gain performance or energy efficiency not just by adding the same type of processors, but by adding dissimilar co-processors, usually incorporating specialized processing capabilities to handle particular tasks."
[Source – *https://en.wikipedia.org/wiki/Heterogeneous_computing*]
[Source – *https://www.intel.ai/heterogenous-computing-ai-hardware-designed-for-specific-tasks*]

[III] Informatics R&D Framework Design+Implementation :
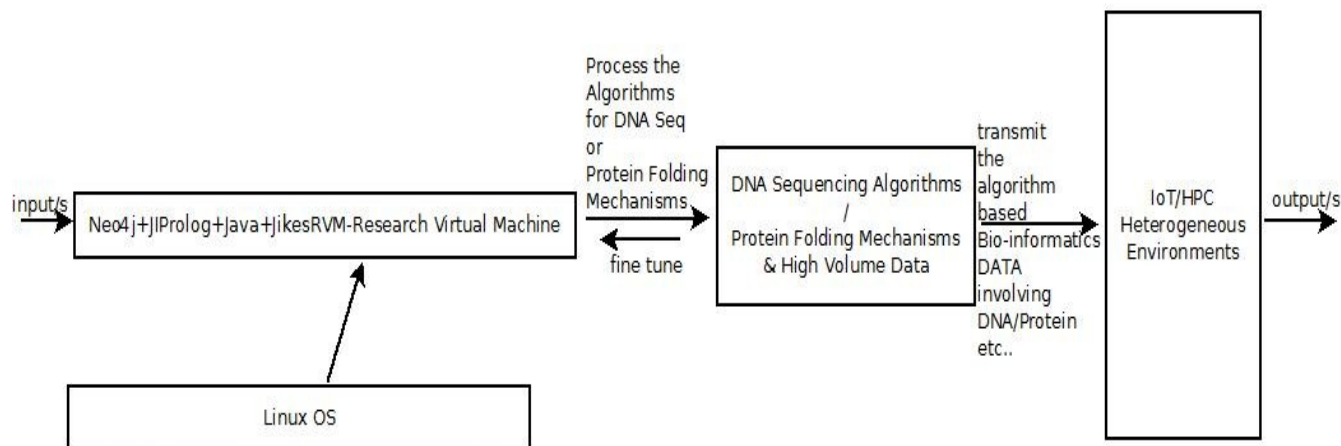
[**Figure I – Algorithm I : Bio-informatics R&D Platform Using GraphDB/Java/JikesRVM/JIProlog/IoT/HPC Heterogeneous Systems**]

[IV] Information on Related Mathematics+Software Used/Useful :

[a] *https://dgraph.io*

[b] *https://neo4j.com*

[c] *https://db-engines.com/en/system/Neo4j*

[d] *https://db-engines.com/en/system/GraphDB;Neo4j*

[e] *www.jiprolog.com* && *https://sourceforge.net/projects/jiprolog*

[f] *https://www.swi-prolog.org/IDE.html* && *https://sewiki.iai.uni-bonn.de/research/pdt/docs*

[g] *https://www.jikesrvm.org*

[h] *https://www.oracle.com/technetwork/java/javase/downloads*

[i] *https://www.w3schools.com/java*

[V] Acknowledgment/s :

Special Thanks to all my **FRIENDS+MENTORS+COLLEAGUES**. Non-Profit R&D.

[VI] Some Important References :

[a] *https://linkurio.us/blog/**graph**tech-eco**system**-2019-part-1-**graph-databases***

[b] *https://docs.microsoft.com/en-us/azure/cosmos-db/**graph**-modeling*

[c] *https://www.compose.com/articles/**introduction-to-graph-databases***

[d] *https://www.cleverism.com/**graph-databases**-effective-**big-data-analytics***

[e] *https://www.g2.com/categories/**graph-databases***

[f] *https://docs.aws.amazon.com/neptune/latest/userguide/**graph-database**.html*

[g] *https://www.**data**nami.com/2017/11/30/look-**graph-database**-landscape*

[h] *https://**www.c-sharpcorner.com**/article/what-is-a-**graph-database***

[i] *https://search**data**management.techtarget.com/feature/Advantages-of-**graph-databases**..*

[j] *https://db-engines.com/en/article/**Graph**+DBMS*

[k] https://en.wikipedia.org/wiki/Cypher_(Query_Language) – **Cypher Query Language**.

[VII] Some Useful Technical Notes (((((via))))) Vixra.org on Related Topics for R&D :

[a] http://www.vixra.org/author/nirmal_tej_kumar

[b] http://www.vixra.org/author/d_n_t_kumar

[c] http://www.vixra.org/author/n_t_kumar

[d] http://www.vixra.org/author/nirmal

[e] https://www.semanticscholar.org/author/Nirmal-Tej-Kumar/123554503/suggest

[VIII] Additional (Bio-informatics Websites/Scientific Publications) Information :

[a] Bio-informatics Websites :

https://en.wikipedia.org/wiki/Folding_at_home
https://www.slideshare.net/SabahatAli9/protein-folding-mechanism

https://link.springer.com/article/10.1007/s00249-007-0256-x
https://foldingathome.org/about

https://en.wikipedia.org/wiki/Rosetta@home
boinc.bakerlab.org/rosetta && *www.**meilerlab**.org/index.php/**rosetta**-tutorials*

[b] DNA Sequencing Publications :

https://www.researchgate.net/publication/274840903_DNA_for_Nano-bio_Scale_Computation...

DNA Sequencing Informatics Framework Using [CoqTP/q*cert/CRSX-HACS/Java/Ocaml/JikesRVM/(RVM-Research Virtual Machine)] in the Context of [IoT/HPC/Cloud Computing/JIProlog/Owl] Hi-End Complex Environments – An Interesting insight into the Technically Challenging R&D domains involving Nano-Bio Systems. –
[Source – http://vixra.org/pdf/1905.0186v1.pdf]

[THE END]