## **Report on comparison of different programming language usage for a given problem**

We were give the dataset of temperature, light, air-quality, sound, humidity and dust measurements of different cities.

We have prepared programs with Python, Java and Unix shell Script languages to give an efficient approach for importing the given Excel CSV file into our program and search through different parameters for a specific record.

**Python**: Python is interpreted, object oriented programming language that has high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing  
components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse

**Java:** Java is a general-purpose computer-programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "write once, run anywhere" . Java is Easy to write and more readable and eye catching. Java has a concise, cohesive set of features that makes it easy to learn and use. It encourages error-free programming by being strictly typed and performing run-time checks.

**Unix Shell Script**: Shell is just programming interface that is useful to access operating system  
services. And Shell scripting is nothing but writing multiple commands on the shell  
to complete a certain task. Bash is considered to be most prominent Unix shell .So, in other words, we can say, bash is command language rather than scripting. Bash is a language to give command over scripting.

**Comparison between the languages**: Java and Python are two of the most popular programming languages in the market right now because of their versatility, efficiency, and automation capabilities. They have similarities, as they both adopt the “everything is an object” design, have great cross-platform support, and use immutable strings and deep standard libraries. However, they have plenty of differences as we have realized by using them to solve our problem.

* In Java, all variable names (along with their types) must be explicitly declared. Attempting to assign an object of the wrong type to a variable name triggers a type exception, whereas In Python, due to duck type variable there is no need to declare variable’s data type. An assignment statement binds a name to an object, and the object can be of any type. If a name is assigned to an object of one type, it may later be assigned to an object of a different type. In shell scripting, like python there is no need to declare variable’s data type
* Java container objects (e.g. Vector and ArrayList) hold objects of the generic type Object, but cannot hold primitives such as int. To store an int in a Vector, you must first convert the int to an Integer. When you retrieve an object from a container, it doesn’t remember its type, and must be explicitly cast to the desired type, Python container objects (e.g. lists and dictionaries) can hold objects of any type, including numbers and lists. When you retrieve an object from a container, it remembers its type, so no casting is required

**Readability:** If we want simple syntax and readability, then Python is more powerful than Java. There are many reasons to select Python over Java. But if you want Platform independency and want to compile code once and want to run it many times, then you can select Java. Readability of code has less to do with the language, and more to do with the developer who wrote the code. Yes, Python usually requires less actual code than other languages. For readability, Python is much more preferred than Java. Java is usually abounding in words; using or containing more words than are necessary. If you mean “more functionality” in fewer lines of code, then it is Python. If we need extensive code reusability (by means of a huge collection of libraries (or modules)), then it is Python.

In our JAVA code we can see in the ReadCsvFile class , to open and importing the CSV file itself, we needed much more lines of codes than Python and Shell Script/ Searching from the file required extra effort and specification in Java than python and shell script. We needed bufferdreader for efficient data streaming and a specific use of comma splitter to identify between different values both in Python and Java but we did not need this in Shell script.

Performance :

JVM code can be JIT-compiled efficiently, using a trivial (and fast) ad hoc compiler. But the same would be exceptionally hard for Python, because of their dynamically typed nature. JVM translates to a fairly low level and straightforward native code.

Writability: Python is much more writable than of Java .Because it providesus list comprehension, some built in library for the ease of the developer and other special utilities. Some a few lines of code would do a better job than java. Although java is very syntax based and OOP based. Shell Scripting is reallyawesome. Most of the jobs can be done by one line of code using shell script.