Implementation of python source code comparison results with Java using bubble sort method

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Abstract. In the implementation of Python and Java source code comparison results are more focused on the scale of the ratio of the number of lines of code, file capacity, and access speed. As for the background of this writing because there are so many programming languages that can be used with the same results but overall we do not know which programming language is more optimal and efficient in terms of the number of lines of code better known in the programming language is LOC (Line of Code) capacity of file access speed. In this study, the authors focus only on Java programming language and python course as a first step to know the ratio of the number of lines of code, file capacity, and access density. To determine the comparison there is a method used is bubble short. The results of the implementation of the comparison of these programming languages for Python programming language to produce the number of LOC (line of code) or the number of lines of code as much as 10, the capacity of the file extension .py by 506 bytes and txt extension of 397 bytes and access speed approximately for less more 4 seconds. While Java produces the number of LOC (line of code) or the number of lines of code as much as 11, the capacity of the file extension. Java of 86.2 Kbytes and extension txt of 477 bytes and access speed for 7 seconds. So do not close the possibility to make other applications python programming language will be more optimal and efficient.

1. Introduction

Improve the world of computer technology has been very rapidly cannot quickly develop with the software world. The term 'software engineering' started rolling for the umpteenth time when it was ordered by NATO in 1968 and 1969 to discuss the 'software crisis'. The software crisis is the name used in the growing difficulties in large and complex systems in the 1960s. It is proposed that building software will reduce the cost of developing the device and produce more reliable software [1].

Early 1970s. Development of structured programming concepts. Publication of Parnas paper on information concealment. Development of Pascal programming language. The development of Smalltalk language introduces the concept of object-oriented development. The late 1970s Early use of software design methods such as the structured design of Yourdon and Constantine. Development of the first programming environment.

Early 1980s. Development of an ADA programming language that includes notions of structured programming and information concealment. Proposal for software engineering environment. The CASE tool was introduced to support the design method. Development of an algorithmic approach to software costs and estimates. Publication of the first edition of this book as the first student textbook on software engineering.
The early 1990s. Object-oriented development is becoming a mainstream development technique. Commercial tools to support engineering requirements are available. The late 1990s Java was developed and released in the mid-1990s. Increased attention is given to the concept of software architecture. Distributed client-server architectures are increasingly being used. The idea of component-based software engineering is proposed. UML is proposed, integrating several notations developed separately to represent object-oriented systems [2]

The early 2000s. The use of integrated development environment is becoming more common. The use of stand-alone CASE tools is declining. UML usage becomes widespread. Increase the use of scripting languages such as Python and PERL for software development. C# is developed as a Java competitor.

2. Methods

2.1. Modeling Problem

During this time in general there are many programming languages found in the programmer and community in general. It's just indirectly know the difference and programming language which is more effective and efficient in making an application or program or software, viewed from the point of view related to the research conducted by our team that is about the sorting of data.

In this study our team tried to do research about comparison programming language that is used between Java programming language and Python programming language, which became the main focus of this research is to find results that implementation of sorting data or sorting data viewed from the side of the LOC (line of code) or the large number of line codes and the large amount of file capacity and process speed. This research is done by making a data sorting algorithm or sorting data ascending that is process of sorting data starting from A-Z, by using Java programming language and Python programming language.

2.2. Problem Solving

Here is a flow chart or problem-solving model scheme that our team is performing to see the comparative results between Java programming language and Python programming language in terms of programming or data sorting algorithms using the Bubble Sort method.

![Figure 1. Framework Java vs Python used Bubble Sort Methodology.](image)

From the schematic in figure 1. we will ultimately be able to see and bias which draws the more effective and superior conclusions of the two programming languages, given the number of program code or coding codes, the number of file capacities and the speed of the process.
2.3. **Sorting Data**

The sorting process not only helps in the processing of data in the form of numbers, the data in the form of words is also often processed and sorted in alphabetical order to facilitate the search data [2]. Examples of word sorting in forms are often found in language dictionaries. The words in the dictionary are sorted to make it easier to search for the words you are looking for.

Sorted data simplifies the search process, checking process, and data repair process in case of errors. In addition, sorting data makes it easier to enter data or merge data. Important information such as the highest and lowest values in a data is very easy to get after the sorting process [3].

2.4. **Bubble Sort**

Simply put, the Bubble Sort algorithm can be defined by sorting it by exchanging data with the data next to it continuously until in a certain iteration there is no change.

To learn Bubble Sort algorithm we only need to understand the way used to sort the data, this algorithm simply uses comparison in operation between its elements. Below is an overview of the Bubble Sort algorithm with an array of "6 2 3 5 9".

### Sorting process first

| Sorted Data | 2 6 3 5 9 |
|-------------|-----------|
| Second      | 2 6 3 5 9 |
| Being       | 2 6 3 5 9 |

### Seconds Sorting Process

| Sorted Data | 2 6 5 3 9 |
|-------------|-----------|
| Second      | 2 6 5 3 9 |
|Being        | 2 6 5 3 9 |

### Third Sorting Process

| Sorted Data | 2 3 5 6 9 |
|-------------|-----------|
| Second      | 2 3 5 6 9 |
|Being        | 2 3 5 6 9 |

**Figure 2. Sorting Process.**

If we look at figure 2. Sorting Process, the second process of data has been sorted correctly. But the Bubble Sort algorithm keeps running until the second process ends. The third process is still running because in the Bubble Sort algorithm the ordered mean is that there is no exchange on a process. This third process is done for data verification.

Bubble Sort algorithm has advantages and disadvantages, for its advantages this method is the simplest method to sort the data. In addition to simple, the Bubble Sort algorithm is easy to understand. Meanwhile, the drawback lies in efficiency. Bubble Sort is an inefficient sorting method because when sorting very large data will be very slow process. In addition, the number of loops will remain the same even if the data is sufficiently sorted.
 Bubble Sort is a sorting method by exchanging data with the right data next to it continuously until it can be ascertained in one particular iteration no more changes. The Bubble Sort method found in 1965 (Kochar and Agrawal, 2014) was inspired by soap bubbles on the surface of the water [4]. The weight of the soap bubble is lighter than the water type, so the soap bubbles are always floating on the surface. The principle as the basis used in the development of Bubble Sort algorithm.

2.5. Bubble Sort Algorithm

In Bubble Sort algorithm we will see how the method of bubble sort method is as follows [4]:

1. Compare the i data with the data to-(i+1) (right adjacent). If it is not suitable then the exchange (i data = i (1 + 1) data and data (i + 1) = i data). What does it mean is not appropriate? If we want the algorithm to generate data in ascending order (A-Z) the unsuitable condition is the i-th data> i data + 1, and vice versa for the descending order (A-Z). (2) Compare the data to-(i+1) with the data to-(i+2). We do this comparison until the last data. Example: 1 with 2; 2 with 3; 3 with 4; 4 with 5 ...; n-1 with n. (3) Finish one iteration, is if we have finished comparing between (n-1) with n. After finishing one iteration we continue the next iteration according to the 1st rule. starting from the data to-1 with the 2nd data, and so on. (4) The process will stop if there is no exchange in one iteration.

2.6. Java

The first programming language is the Java programming language. This programming language is one type of programming language that many of us find in applications, either in a computer, or a mobile phone and smartphone. With these advantages, java is really a very popular programming language and also widely understood and easy to learn.

From what we know, the name of the programming language developed by SUN microsystem in the era of 1991, is a programming language whose name is inspired from coffee made in Indonesia, precisely from Java plains. So it has until now, this programming language has a symbol of coffee being brewed.

Currently, the patent of the use of Java programming language itself is held by Oracle. Lots of palikasi and also software - software that is very useful and also useful for users, created and jga developed by using the Java programming language.

Examples of applications that use java programming language are 1) The default application oracle 2) Applications on non-OS mobile phones, such as in the series - series of mobile phone era of the 2000s 3) Applications and also games on the mobile OS, such as Symbian, Android, and also Windows Phone 4) Some applications on the computer and desktop PC.

Java is one programming language that has many advantages. One of the main advantages of this Java programming language is because Java is a multi-platform programming language, which means it can be used in various operating systems and other software bases. In addition, there are several other advantages of Java, namely: 1) Easy to develop, 2) Have a more complete library, 3) Ease in compiling scripts, and 4) Have a wide market, because smartphones are booming and widely used.

2.7. Python

Python was developed by Guido van Rossum in 1990 at CWI, Amsterdam as a continuation of the ABC programming language. The last version released by CWI is 1.2. In 1995, Guido moved to CNRI while continuing the development of Python [5]. The latest version released is 1.6. In 2000, Guido and the Python core developers moved to BeOpen.com which is a commercial company and formed BeOpen PythonLabs. Python 2.0 is issued by BeOpen. After removing Python 2.0, Guido and some members of the PythonLabs team moved to DigitalCreations [6].

Python is currently under development by a group of programmers co-ordinated by Guido and the Python Software Foundation. Python Software Foundation is a non-profit organization established as intellectual property holder of Python since version 2.1 and thus prevents Python from being owned by commercial companies. Currently Python distribution has reached version 2.6.1 and version 3.0 [7].

The name Python was chosen by Guido as the name of his creation because of the love of guido on television show Monty Python's Flying Circus. Therefore, often the typical expressions of the event
often appear in correspondence between Python users. In Python there are some features, features that Python has is as follows: 1) Have extensive literature; in the Python distribution has provided 'ready-made' modules for various purposes. 2) Have a clear grammar and easy to learn. 3) Have a source code layout rule that makes it easy to check, re-read and rewrite the source code. 4) Object-oriented. 5) Have an automatic memory management system (garbage collection, such as java). 6) Modular, easy to develop by creating new modules; the modules can be built in Python or C / C ++ languages. 7) Having automatic garbage collection facilities, as well as in Java programming language, python has the facility of setting computer memory usage so that programmers do not need to make computer memory settings directly.

3. Results and Discussion

3.1. Bebble Sort Algorithm
In the use of Bubble Sort algorithm method is intended to determine the results of algorithm comparison using Java programming language and python programming language seen from the side of the number of lines of code used and the number of file capacity in each program code. Here are the results of the discussion that our team has been working on.

3.2. Bebble Sort Java Algorithm
In the Bubble Sort algorithm for Java programming language is in use can be various versions, the code program that our team created is the Java program code Bubble Sort method is the most effective and efficient as follows:

```java
package bubblesortjv;
/**
 * @author insanudin
 */
public class BubbleSortJV {
    public static void main(String args[]) {
        int a[]={50, 20, 25,18, 12, 31, 35, 42, 1};
        for(int i=1;i<a.length;i++) {
            for(int h=0;h<a.length-1;h++) {
                if(a[h+1]<a[h]) {
                    int tmp=a[h+1];
                    a[h+1]=a[h];
                    a[h]=tmp;
                }
            }
        }
        // mencetak hasil
        for(int h=0;h<a.length;h++) {
            System.out.println(a[h]+",");
        }
        The result is as follows can also be seen in figure 2:
1, 12, 18, 20, 25, 31, 35, 42, 50.
```
Figure 3. The result bubble sort java.

The result of sorting bubble Sort in java at figure 3. is done by showing the result is different with python, in python it happened loop continuously until the sequencing is done depends on the amount of data of ordering result.

3.3. Bubble Sort Python Algorithm

In the Bubble Sort algorithm for Python programming language is in use can be various versions, the code program that our team created is the Python program code Bubble Sort method is the most effective are as follows:

```python
def bubblesort(listdata):
    for outiter in range(len(listdata)-1,0,-1):
        print(listdata)
        for i in range(len(listdata)-1):
            if listdata[i]>listdata[i+1]:
                temp=listdata[i]
                listdata[i]=listdata[i+1]
                listdata[i+1]=temp

data=[50, 20, 25,18, 12, 31, 35, 42, 1]
bubblesort(data)
```

The result is as follows can also be seen in figure 5:
The First Data Ordering Process:

[50, 20, 25, 18, 12, 31, 35, 42, 1]
[20, 25, 18, 12, 31, 35, 42, 1, 50]
[20, 18, 12, 25, 31, 35, 1, 42, 50]
[18, 12, 20, 25, 31, 1, 35, 42, 50]
[12, 18, 20, 25, 1, 31, 35, 42, 50]
[12, 18, 20, 1, 25, 31, 35, 42, 50]
[12, 18, 1, 20, 25, 31, 35, 42, 50]
[12, 1, 18, 20, 25, 31, 35, 42, 50]

Second Data Ordering Process

[1, 12, 18, 20, 25, 31, 35, 42, 50]
[1, 12, 18, 20, 25, 31, 35, 42, 50]
[1, 12, 18, 20, 25, 31, 35, 42, 50]
[1, 12, 18, 20, 25, 31, 35, 42, 50]
[1, 12, 18, 20, 25, 31, 35, 42, 50]
[1, 12, 18, 20, 25, 31, 35, 42, 50]
[1, 12, 18, 20, 25, 31, 35, 42, 50]
[1, 12, 18, 20, 25, 31, 35, 42, 50]

Figure 4. Bubble sort python process.

Figure 5. The result bubble sort python.

The results obtained in python programming takes place based on the large amount of data and iteration is done based on the large amount of data. The process of sorting is done on the ninth repeatable result based on the large number of data as many as nine data that is 1, 12, 18, 20, 25, 31, 35, 42, 50.
4. Conclusion
Can we see from the test results in section Figure 3 and Figure 5 we can conclude with the results in accordance with the purposes of this study are as follows in table 1:

| No | Program Name | Amount LOC | File Capacity | File Capacity txt | Speed Access |
|----|--------------|------------|---------------|-------------------|--------------|
| 1  | JAVA         | 11         | 86.2 Kbytes   | 477 bytes         | 7 ps         |
| 2  | PYTHON       | 10         | 506 bytes     | 397 bytes         | 4 ps         |

Viewed from table 1 we can conclude that python programming language is superior views of the Number of Code Codes, File Capacity both extention py and txt and access speed is good.

5. References
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