1. **Specific Area /Sub-area of the paper** 
   1. Area- Software Systems; Sub-Area: Controlled Environment
2. **Problem(s) specifically addressed by the paper / Research Questions**

In this paper, the research problems being addressed relates to software systems in a controlled environment, which also revolves around software visualization approach. As per the paper, it presents CodeCity platform in Nutshell with 2D polymetric view and visualization problems associated with the design and color. The authors present software system within in a CodeCity environment, which have different features to support customizable visualizations.

The authors have defined the following research questions:

RQ1) Does the application of CodeCity increases correctness of solutions in programming comprehension tasks in comparison with non-visual exploration tools, with no regard to object system’s size?

RQ2) Does the use of CodeCity leads to reduction in time needed to provide a solution for program comprehension tasks in comparison with non-exploration tools, with no regard to object system’s size?

RQ3) What are the task types for specific CodeCity in relation to visual exploration tools that makes a difference in correctness or completion time?

RQ4) What are the benefits of using CodeCity in relation to correctness and time, based on user’s background.

RQ5) What the potential benefits of using CodeCity in relation to correctness and time, based on user’s experience.

1. **Approach, Techniques, Models, Methodology used to tackle the problem(s)**
   1. The authors relied on systematic mapping study that relied on the experimental design of the subject analysis to provide an analysis and evaluation of the effectiveness of software systems using CodeCity. Additionally, through the systematic review approach, the program comprehension technique has been widely discussed in the paper within the context of software visualization, software maintenance and reverse engineering.
2. **Results Obtained / Evaluation**

In ***RQ1,*** the authors found that the application of CodeCity eliminated the unusual large discrepancy between 2 different groups. The results obtained showed that with the use of this tool, the level of correctness was scientifically higher. There was no variation in completion time in the application of CodeCity.

In ***RQ2***, the authors found that there is no interaction between different factors that could have resulted the completion time. Hence the authors through research found that there was a significant effect due to the application of the tool on the completion time

In ***RQ3,*** the authors used defined maintenance task definition framework to extract static information. The tasks performed by the authors involved estimating impact which found that CodeCity significantly outdid Eclipse in terms of the correctness and was also found to be much faster than eclipse. For completion time, it was found that Excel was slightly faster as compared to CodeCity.

In ***RQ4,*** the authors assessed on the effect of tool on correctness on tool and time in relation to background, and found that correctness was significantly higher for users who performed the analysis on the large size systems without any regard to the tool used. Similarly, there was a significant effect of the tool used on time, where time was lower CodeCity users.

In ***RQ5,*** the authors assessed people with different experience in relation to correctness and time and found that for the first time, those with little experience took more time in the initial tasks than those with experience. There was a significant effect of the tool in the completion time as far as user experience is concerned.

1. **Strengths of the Paper**

The research and data analysis were quite comprehensive, and the authors managed to obtain accurate results based on the subject matter of this study. This research was conducted by authors with vast experience, hence the results and conclusion deduced in this study was of great benefit to them and to others.

1. **Weaknesses of the Paper**

The authors did a complex research with a lot of analysis about the subject matter, which could make readers to understand about the whole idea of this project. Some of the information published by the authors are not clear. The authors also used some sources that are too old

1. **Potential Improvements / Extensions**

The application of the relevant and updated sources can make this research to have meaningful in the modern world. Similarly, application of other modern software visualization tools can be used to enhance this research.

1. **Other comments (if any)**

This assignment provides more insights through extensive research on the use of CodeCity tool in software visualization etc

.

1. **Why the authors undertake this research study and what was the specific research problem they** addressed in this paper?

The rationale behind authors undertaking this research id due to existence of research work and literature regarding software systems and software visualization approach, which are worth studying.

1. **What methodology the authors used to tackle the research problem? Explain it briefly.**

The authors adopted systematic mapping study of subject analysis and systematic literature review. This include designing the research questions based on the study and reviewing research work and underlying literatures to get comprehensive information about the subject of this research. Ideally, with systematic mapping study, the idea is to map existing literature on a particular subject.

1. **Describe briefly the results obtained from this research study.**

The author obtained results relating to correctness and completion time as far as application of CodeCity is concerned. As per the results, the overall CodeCity showed an increase in correctness of 24.6% over Eclipse + Excel. While for on the other hand a reduction in completion time of 12.01 over Eclipse + Excel.

1. **Comment on the results presented in Table 1 and 5 and 7. How did the authors organize their results? Explain each table?**

In table 1, it provides an analysis of evaluation of software visualization from experimental design perspective. The table is organized and shows results presented from different authors, from different subjects and object system. In table 2, it presents different maintenance concerns, program comprehension and design assessment of quality. The results have been organized in terms of task and concern, where task presents the descriptions and rationale for the program comprehension. In table 7, it presents analysis of variance for correctness and completion. The results show a significant effect of the tool on the completion time and on the system’s size.

1. **What is the difference between Syntactic and Semantic consistency?**

A formal system is referred to as syntactic system if it is hard to deduce both a negation and preposition. On the other hand, semantic consistency provides a guarantee correctness and conciseness on the specific domain that comprises of different data sources.

1. **Explain briefly the content of Table 5.**

Table 5 presents defined set of tasks regarding the program comprehension. The table provides different forms of analysis based on their description and rationale and their corresponding concern.

1. **Summarize the findings with respect to RQ#1 ,2 , 3, 4, and 5.**

In RQ#1the authors found that the application of CodeCity eliminated the unusual large discrepancy between 2 different groups. In RQ#2, found that there was a significant effect due to the application of the tool on the completion time. In RQ#3, the authors used defined maintenance task definition framework to extract static information. The tasks performed by the authors involved estimating impact which found that CodeCity significantly outdid Eclipse in terms of the correctness and was also found to be much faster than eclipse, In RQ#4, the authors assessed on the effect of tool on correctness on tool and time in relation to background, and found that correctness was significantly higher for users who performed the analysis on the large size systems without any regard to the tool used. Finally, in RQ#5, the author found that there was a significant effect of the tool in the completion time as far as user experience is concerned.

1. **What does figure 1 represent? Explain briefly**

In figure, it depicts representation of software in CodeCity visual representation platform. The diagram is represented in Nutshell, in 2D polymetric view, which also represents different visual properties.

1. **How this work can be improved or extended?**

This work can be improved by proving conducting an extensive research and presenting the visualization in 3D polymetric and isometric view of large-scale software.

1. **How this paper can be helpful practically (from the point of view of a software engineer working in the industry)?**

This paper can be helpful to software engineer since as it provides more insights on application of CodeCity tool, which is a language dependent and 3 D visualization tool, which can also help software engineers in the analysis of large scale software systems.