

Generating Surface Model through R using Excel Data

P.S.S. Nagalakshmi*

Digital Techniques for Design and Planning, Jawaharlal Nehru Architecture and Fine Arts University,
Masab Tank, Hyderabad, Telangana, India

Abstract

Generating surface model through R using excel data indicates to create different surface models according to the requirement of the user. In this platform a simple matrix is sufficient to incorporate various surface models. This concept is an interdisciplinary activity in between mathematics and computer science.

Keywords: Surface model, matrix, R, GUI

***Author for Correspondence** E-mail: sathya.krishnat@gmail.com

INTRODUCTION

Surface Modeling

It is a mathematical technique for representing solid appearing objects. Surface modeling is a more complex method for representing objects than wireframe modeling, but not as sophisticated as solid modeling. Surface modeling is widely used in CAD (computer aided design) and GIS (Geographic Information System) for illustrations and architectural renderings. It also used in 3D animation for games and other presentations.

Matrix

Any data that is organized in columns and rows can be represented as a matrix. Matrices are used to represent real-world data such as the elevations of the objects and surface and also habits, or traits of a population of people etc.

R

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS.

GUI

It is a program interface that takes advantage of the computer's graphics capabilities to make the program easier to use. Well-designed graphical user interfaces can free the user from learning complex command languages. On the other hand, many users find that they work more effectively with a command-driven

interface, especially if they already know the command language.

OBJECTIVES

1. To create surface model.
2. To create graphical user interface.
3. To obtain the link between data in Excel sheet to R.
4. To alter the surface model according to modified data in excel.
5. To create application program interface.
6. To create surface model from ground control points.

METHODOLOGY

Workflow of generating surface model through R from excel data:

Input Data from Excel Sheet (Figure 1)

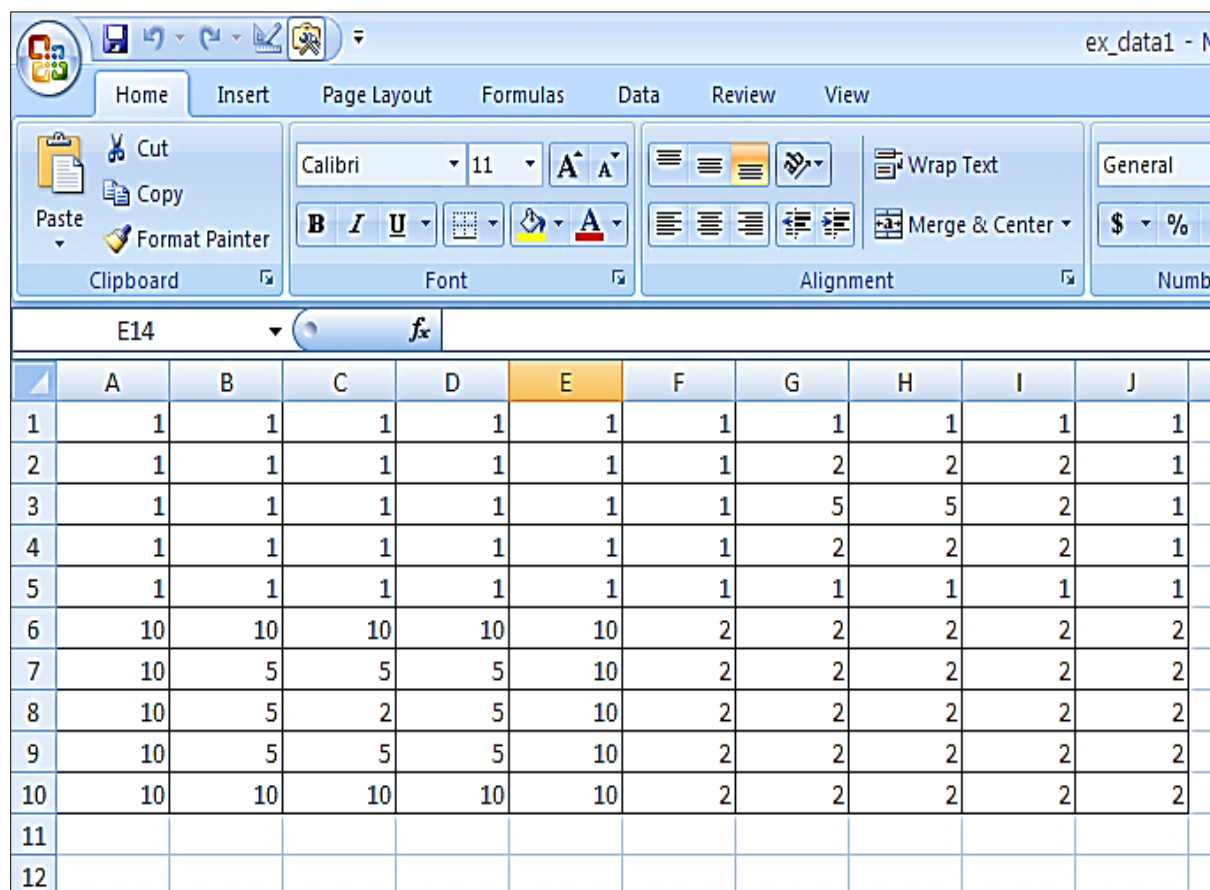
Creating database through excel is easy as compared to other database software. Due to this reason researcher adopted excel sheet. Representation of data in excel in terms of ground elevation maintain adequate surface model.

Graphical User Interface (Figure 2)

Most of the users are not aware of coding in R software. This research provides an opportunity to use graphical user interface instead of concentrating on coding.

Surface Model (Figure 3)

Digital elevation models can be obtained easily from R software without contour data and it is possible to eradicate digitization.



	A	B	C	D	E	F	G	H	I	J
1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	2	2	2	1
3	1	1	1	1	1	1	5	5	2	1
4	1	1	1	1	1	1	2	2	2	1
5	1	1	1	1	1	1	1	1	1	1
6	10	10	10	10	10	2	2	2	2	2
7	10	5	5	5	10	2	2	2	2	2
8	10	5	2	5	10	2	2	2	2	2
9	10	5	5	5	10	2	2	2	2	2
10	10	10	10	10	10	2	2	2	2	2
11										
12										

Fig. 1: Input Data from Excel Sheet.

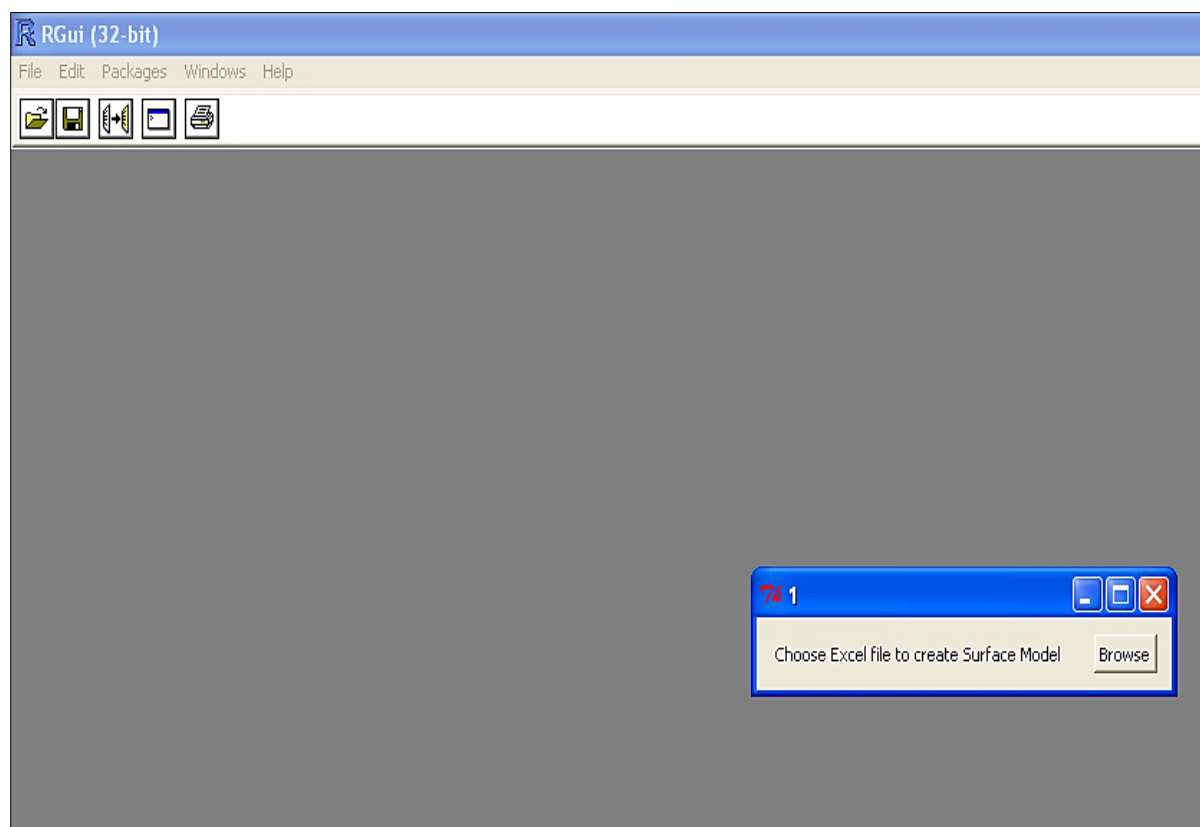


Fig. 2: Graphical User Interface.

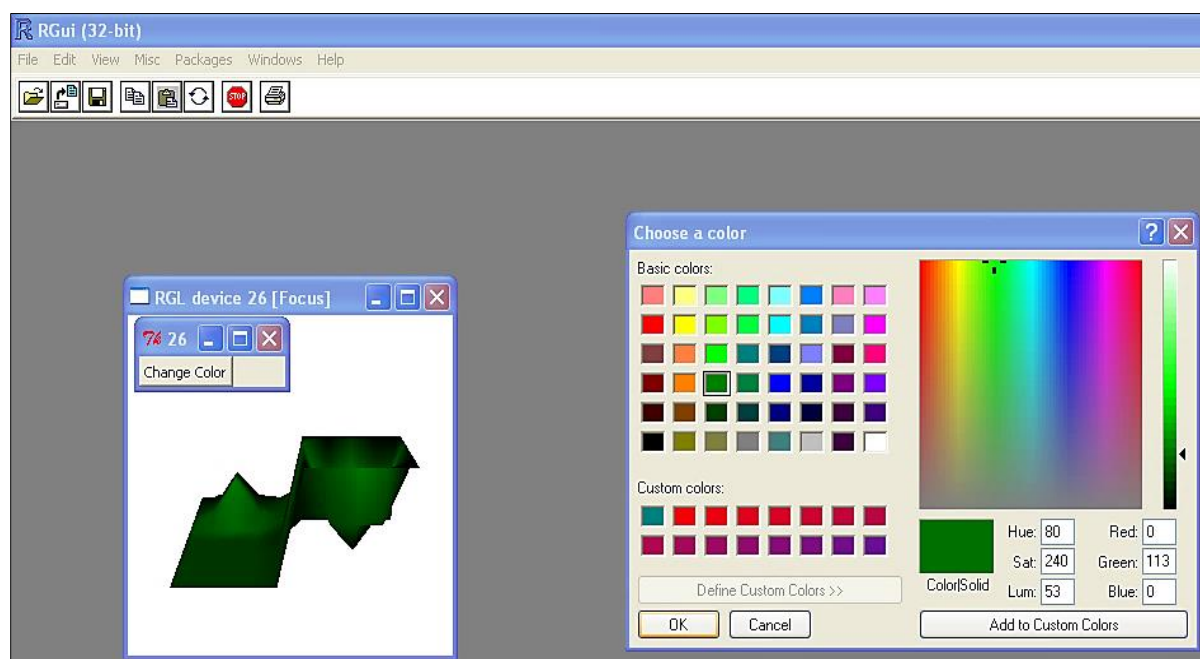
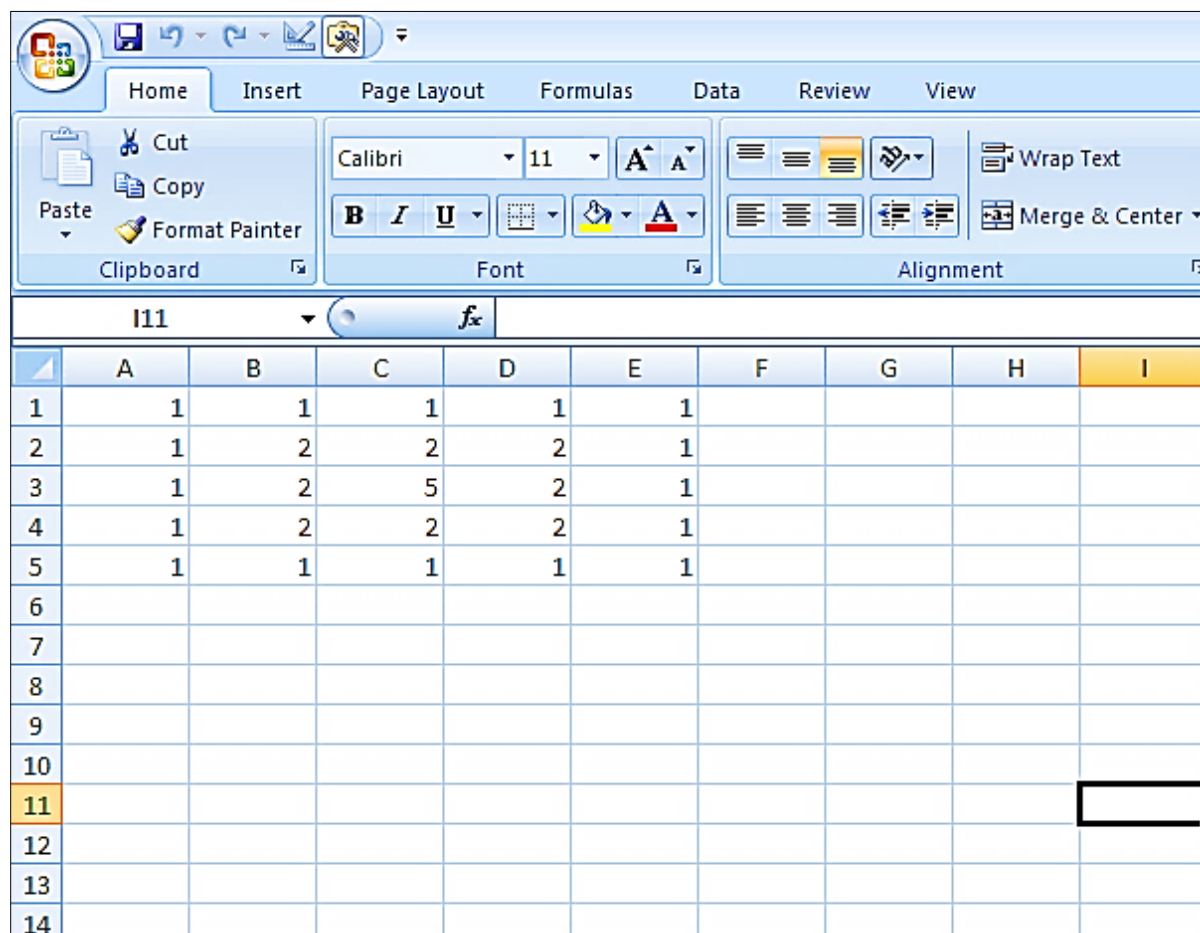


Fig. 3: Surface Model.

Various Surface Models (Figures 4 and 5)

It is possible to alter surface model with respect to the alteration of data in excel.



The screenshot shows the Microsoft Excel interface with the 'Home' tab selected. The ribbon includes 'Clipboard', 'Font', and 'Alignment' groups. The data table is as follows:

	A	B	C	D	E	F	G	H	I
1	1	1	1	1	1				
2	1	2	2	2	1				
3	1	2	5	2	1				
4	1	2	2	2	1				
5	1	1	1	1	1				
6									
7									
8									
9									
10									
11									
12									
13									
14									

Fig. 4: Various Surface Models Data in Excel.

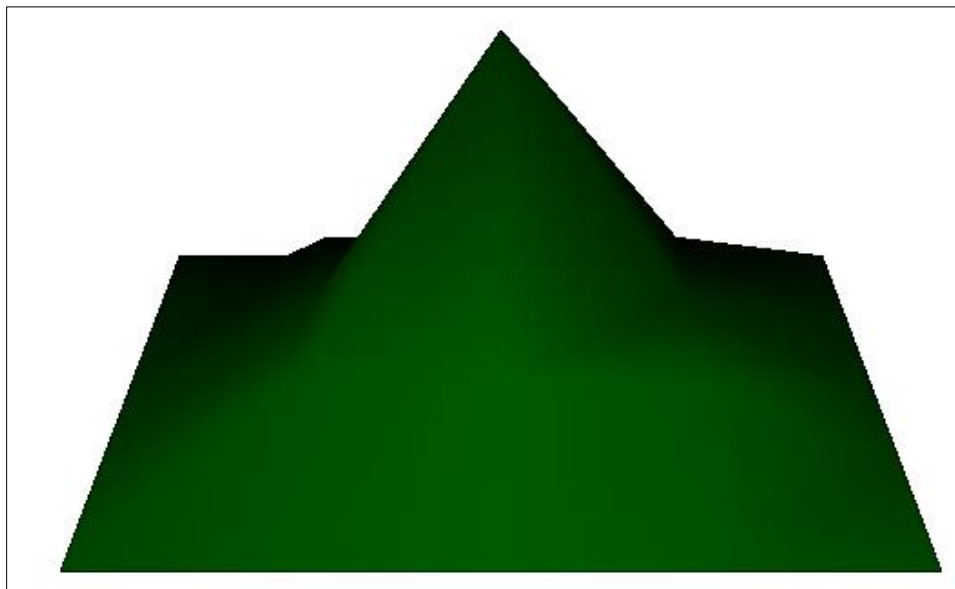


Fig. 5: Various Surface Models.

CONCLUSION

Researcher's ambition is to provide graphical user interface to generate various surface models in R software using excel data. This paper fetches to create application program interface and same logic will be implemented in cloud computing also to eradicate desktop works.

REFERENCES

1. <http://encyclopedia2.thefreedictionary.com/surface+modeling>
2. http://www.webopedia.com/TERM/G/Graphical_User_Interface_GUI.html
3. <https://www.nceas.ucsb.edu/files/scicomp/Downloads/RProgramming/BestFirstRTutorial.pdf>
4. <https://cran.r-project.org/web/packages/rgl/rgl.pdf>
5. <https://cran.r-project.org/web/packages/XLConnect/XLConnect.pdf>

Cite this Article

Nagalakshmi PSS. Generating Surface Model through R using Excel Data. *Journal of Artificial Intelligence Research & Advances*. 2016; 3(1): 26–29p.