Report for homework no.3 and no.4

Ly Hoang Thien

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1 Introduction

As part of homework no.3 no.4, we had to set up an experiment to check whether a certain problem with reading data from graphs still occurs and whether the "best practical experience" developed through years actually works. For this purpose, I prepared a online survey created by Google Form Survey. The survey was sent to my high school classmate as well as my family and relatives. Below is the hyperlink to my survey.

Click here: Link to my survey

2 Discussion of the survey

This survey includes one main section containing two graphs: 3D pie chart and bar chart, representing the same data about areas of five centrally controlled cities in Vietnam (Can Tho, Da Nang, HCM City, Ha Noi and Hai Phong).

1. The first question in the survey is designed to ascertain about the nationality of respondents.
2. The second question in the survey is designed to ascertain about the age of respondents
3. The third question comes with the visualization of **3D pie chart** for areas for five centrally controlled cities in Vietnam. The aim is to check, whether those asked people easily compare the areas between Da Nang City and Can Tho city or not. The question is: Which city has larger area (in form of multiple choice questions, with three selection: Da Nang City, Can Tho City or having problem in reading the data from graph).
4. The fourth question, with the same mechanism, with the same question and choices for answer, but comes with the **bar chart**.
5. The final question, with the images of **3D pie chart** and **bar chart**, associated with the question: "Which graph do you find clearer in the aspect of comparing and reading data?".

For the sake of avoiding missing values for our survey, every question is obligatory to be answered.

The purpose of this approach is to verify, firstly, whether our respondents had problem in reading data in **3D pie chart**, secondly, would it be better to read data in **bar chart** and eventually, whether our experience goes along with the "best practical experience" we desired, that we should use **bar chart** instead of **3D pie chart**.

3 Group of respondents

This part relates to question 1 and 2. The group of respondents consists of people I know- my high school classmates, my family and my relatives. The range age of respondents is from 20 to 60 years old. Totally, I collected responses from 57 people.

4 The focal experiment

4.1 Part A - Finding greater portion in 3D pie chart.

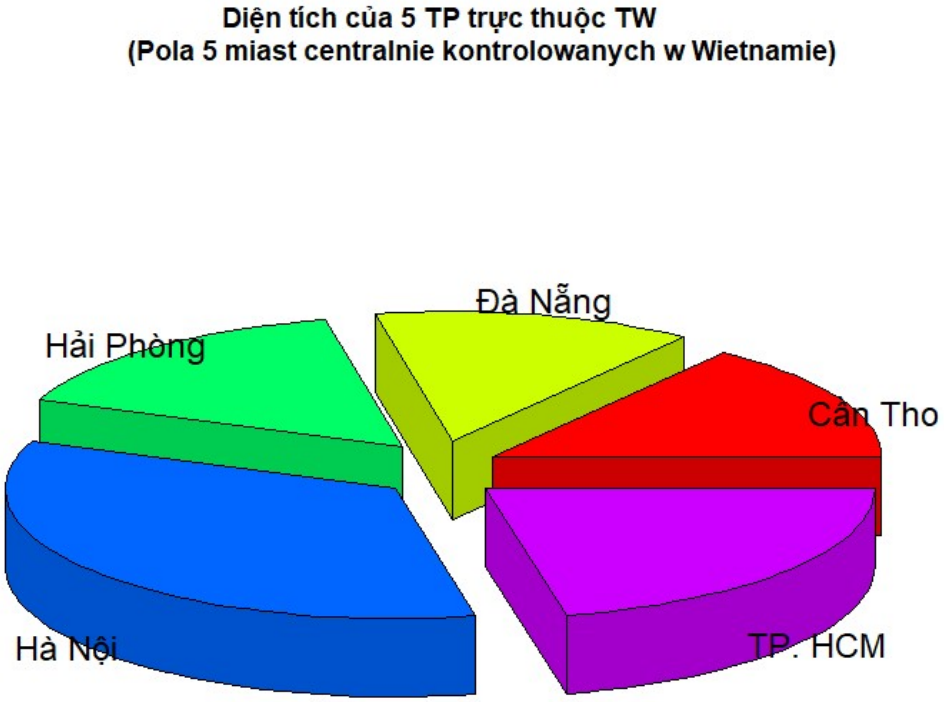


Figure 1: 3D pie chart for question 3.

In this part, I checked that how respondents deal with portion of 3D pie chart without the description of percent for each piece. The question is "Which city has larger area, Da Nang (yellow) or Can Tho (red)?". That question seem to be simple, but 30 people (stand for 52.6 percent) gave the wrong answer (which is Da Nang city). In addition, 23 people (account for 40.4 percent) responded that it's difficult to decide. The correct answer (Can Tho city) was able to be indicated just by 4 people (7 percent).

However, most interestingly, turned out to be that 52.6 percent of people believed that the yellow piece is greater than the red piece in this graph, instead of responding that it's hard to read in this graph. Hence, it shows that 93 percent of respondents had problem (responded incorrectly or could not reply) in reading this chart.

4.2 Part B- Finding observation with greater value in bar chart.

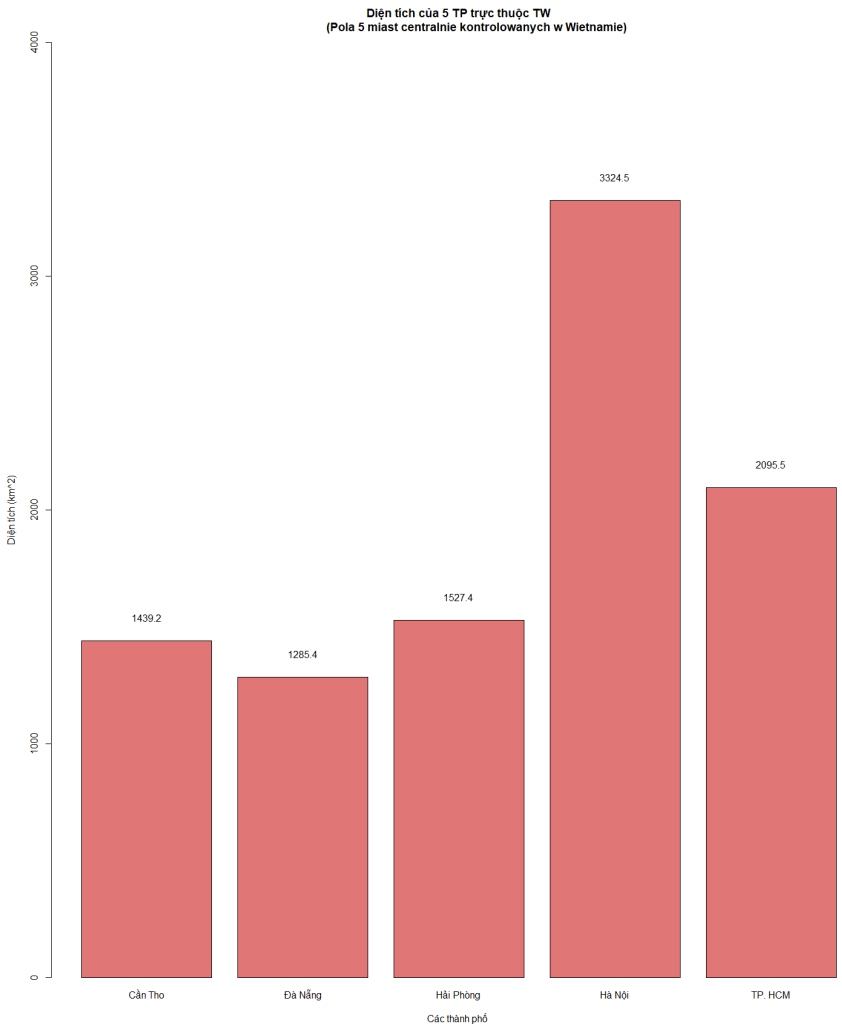
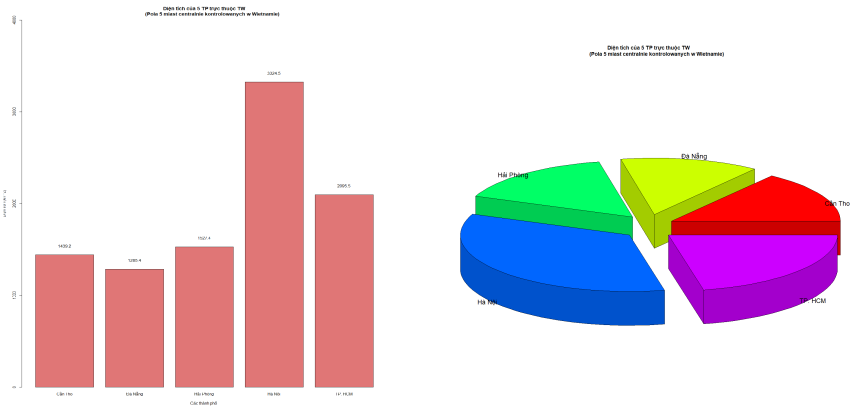


Figure 2: bar chart for question 4.

In this part, with the same question: "Which city has larger area: Da Nang city or Can Tho city?". Without using the different colors to highlight those 2 cities, I wanted to see the real effectiveness of bar chart.

As expected in our hypothesis, 54 out of 57 people gave the correct answer: Can Tho city (stands for 94.7 percent), only 1 of them responded that he/she still had problem in reading data and 2 of them responded wrongly.

4.3 Part C- Verification for the effectiveness of bar chart over 3D pie chart.



GRAPH A **GRAPH B**

Figure 3: Comparision between bar chart and 3D pie chart- question 5.

A question was given with the formality: "Which graph is better in term of reading and comparing data?".

The replies perfectly suit our hypothesis, 100 percent, 57 out of 57 respondents answered that graph A- bar chart is better than graph B- 3D pie chart in aspect of reading and comparing data.

5 Summary

The thing we learned from this experiment that people frequently have problem in judging angles, especially angles in three dimensional space (as in the case of 3D pie chart). It seems not easily achievable for most to find the greater portion in 3D pie chart with pieces approximately equal. The problem is solvable with the use of bar chart with the indicated number on each bar.