

Jazzing up your graph

Visual representations

10 marks

- a. (5 marks) Write out all of the values that appear in the diagram that are categorical and say how they are encoded in the diagram.

Identifications of different programs are categorical data. Here they are encoded as labels and y coordinate of cones (same program have same y coordinate), the data having value Program A, Program B and Program C.

The phases during program start up are also categorical data. They are also encoded as labels and x coordinate here, having value Launching, Plash Screen, Loading and Processing (note: although we are using word “phase” here, it’s not ordered data in this question)

length of time is also categorical data, it has value as integer from 0-5. It is encoded as height and color of cone

- b. (3 marks) Based on Cleveland and McGill’s ordering of elementary tasks, think about how the values of **Time for Programs to Start Up** encoded in the above chart. To that end:

- Identify which elementary tasks are used in the encoding of these values?

create a simulated 3d space. convert the time for program j to complete phase i into a integer k in [0,5], then create cone with height=k and constant bottom surface area s. then put the cone’s bottom on $x=i, y=j, z=0$ of the simulated 3d space. repeat for all combinations of i,j

- Which elementary tasks are most likely to be used in decoding the values by the reader? Comment on the likely accuracy of this decoding.

reader need to locate what x,y coordinate the cone is on to tell what program and what phase is the data about. Then they need to eyeball the height of the cone in the simulated 3D space.

It’s accurate to locate the x,y coordinate of the cone because the bottoms of cones are positioned along $z=0$, and they can see 1 straight line which connects all data with $x=i$, another straight line which connects all data with $y=j$. They are in a common aligned scale. The height is also in common aligned scale (all heights begin from $z=0$, there are also scales on the left and back of the graph which provide matching height in y and x axis). However it’s more difficult to decode height as in 3D faraway objects appears smaller in height.

- c. (2 marks) Critically assess the contribution of the scales appearing at the left and back of the plot.

it makes it easier to decode height. as now heights are not only aligned in z axis (bottoms of cones have same height), we can also align height of cone with the scale in x or y axis (whichever is closer). for example we can compare loading time of program C with the scale with ($x=\text{loading}, z=3$) on the back of the graph.