

Relações Binárias em Conjuntos

Trabalho Prático de Matemática Discreta

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Resumo. Na matemática e na lógica, uma relação binária ou 2-ária é uma relação entre dois elementos. Uma relação binária é um conjunto de pares ordenados. As relações binárias são comuns em muitas áreas da ciência para definir muitas propriedades e conceitos. Neste trabalho, foram analisados arquivos que mapeavam diversos conjuntos e as relações entre seus elementos e essas foram classificadas de acordo com as suas propriedades.

1 Relações em grafo Em matemática e ciência da computação, grafo é o objeto básico de estudo da teoria dos grafos. Tipicamente, um grafo é representado como um conjunto de pontos (vértices) ligados por retas (as arestas).

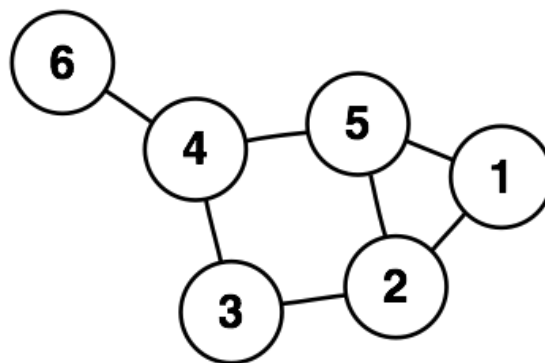


Figure 1. Exemplo ilustrativo de um grafo com 6 vértices e 7 arestas

2 First Page The first page must display the paper title, the name and address of the authors, the abstract in English and “resumo” in Portuguese (“resumos” are required only for papers written in Portuguese). The title must be centered over the whole page, in 16 point boldface font and with 12 points of space before itself. Author names must be centered in 12 point font, bold, all of them disposed in the same line, separated by commas and with 12 points of space after the title. Addresses must be centered in 12 point font, also with 12 points of space after the authors’ names. E-mail addresses should be written using font Courier New, 10 point nominal size, with 6 points of space before and 6 points of space after.

The abstract and “resumo” (if is the case) must be in 12 point Times font, indented 0.8cm on both sides. The word **Abstract** and **Resumo**, should be written in boldface and must precede the text.

3 CD-ROMs and Printed ProceedingsIn some conferences, the papers are published on CD-ROM while only the abstract is published in the printed Proceedings. In this case, authors are invited to prepare two final versions of the paper. One, complete, to be published on the CD and the other, containing only the first page, with abstract and “resumo” (for papers in Portuguese).

4 Sections and ParagraphsSection titles must be in boldface, 13pt, flush left. There should be an extra 12 pt of space before each title. Section numbering is optional. The first paragraph of each section should not be indented, while the first lines of subsequent paragraphs should be indented by 1.27 cm.

4.1 SubsectionsThe subsection titles must be in boldface, 12pt, flush left.

5 Figures and CaptionsFigure and table captions should be centered if less than one line (Figure 2), otherwise justified and indented by 0.8cm on both margins, as shown in Figure 3. The caption font must be Helvetica, 10 point, boldface, with 6 points of space before and after each caption.



Figure 2. A typical figure

In tables, try to avoid the use of colored or shaded backgrounds, and avoid thick, doubled, or unnecessary framing lines. When reporting empirical data, do not use more decimal digits than warranted by their precision and reproducibility. Table caption must be placed before the table (see Table 1) and the font used must also be Helvetica, 10 point, boldface, with 6 points of space before and after each caption.

6 ImagesAll images and illustrations should be in black-and-white, or gray tones, excepting for the papers that will be electronically available (on CD-ROMs, internet, etc.). The image resolution on paper should be about 600 dpi for black-and-white images, and 150-300 dpi for grayscale images. Do not include images with excessive resolution, as they may take hours to print, without any visible difference in the result.

7 ReferencesBibliographic references must be unambiguous and uniform. We recommend giving the author names references in brackets, e.g. [Knuth 1984], [Boulic and Renault 1991], and [Smith and Jones 1999].



Figure 3. This figure is an example of a figure caption taking more than one line and justified considering margins mentioned in Section 5.

Table 1. Variables to be considered on the evaluation of interaction techniques

	Chessboard top view	Chessboard perspective view
Selection with side movements	6.02 ± 5.22	7.01±6.84
Selection with in- depth movements	6.29±4.99	12.22±11.33
Manipulation with side movements	4.66± 4.94	3.47±2.20
Manipulation with in- depth movements	5.71 ±4.55	5.37 ±3.28

The references must be listed using 12 point font size, with 6 points of space before each reference. The first line of each reference should not be indented, while the subsequent should be indented by 0.5 cm.

References

- Boulic, R. and Renault, O. (1991). 3d hierarchies for animation. In Magnenat-Thalmann, N. and Thalmann, D., editors, *New Trends in Animation and Visualization*. John Wiley & Sons ltd.
- Knuth, D. E. (1984). *The T_EX Book*. Addison-Wesley, 15th edition.
- Smith, A. and Jones, B. (1999). On the complexity of computing. In Smith-Jones, A. B., editor, *Advances in Computer Science*, pages 555–566. Publishing Press.