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Adsorbing bargraph paths in a q-wedge

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2006 J. Phys. A: Math. Gen. 39 3847

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J. Phys. A: Math. Gen. **39** (2006) 3847 doi:10.1088//39/14/C01

Corrigendum

Adsorbing bargraph paths in a q-wedge

E J Janse van Rensburg 2005 *J. Phys. A: Math. Gen.* **38** 8505–8525

An error in figure 4 is corrected here. The correct version of this figure is given in figure 1 below; the second and third diagrams following the equal sign have been replaced with their mirror images. Recurrances for bargraph paths interacting with the x-axis can be obtained from the classification of such paths as in figure 1. The correct recurrances were given in the original paper.

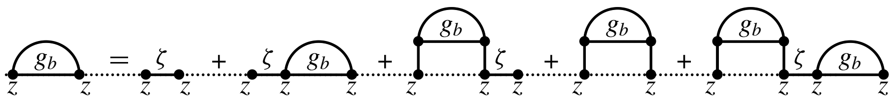

Figure 1. Every bargraph path is either a single horizontal edge, or it is an arbitrary bargraph path starting in a horizontal edge, or it is a primitive bargraph path followed by a horizontal edge, or it is a primitive bargraph path, or it is a primitive bargraph path, followed by a horizontal edge and then followed by an arbitrary bargraph path; see [1]. Two models of adsorbing bargraph paths can be defined: either the vertices adsorb in the x-axis with activity or generating variable z, or the edges adsorb in the x-axis with activity or generating variable ζ. The resulting functional recursions for the generating functions are given by equations (1) or (2).

The recurrances for the generating function of a model of bargraph paths interacting with the x-axis is given by

$$g_{b,z} = tz^2 + tzg_{b,z} + t^3z^3g_{b,1} + t^2z^2g_{b,1} + t^3z^2g_{b,1}g_{b,z} \tag{1}$$

where t generates edges (steps) in the path, and z generates visits (vertices in the x-axis), or

$$g_{b,\zeta} = t\zeta + t\zeta g_{b,\zeta} + t^3\zeta g_{b,1} + t^2g_{b,1} + t^3\zeta g_{b,1}g_{b,\zeta}, \tag{2}$$

where ζ generates edges in the x-axis. These recurrances can be derived from figure 1. We define a *primitive* bargraph path as a path which avoids the x-axis, except for its endpoints which are fixed in the x-axis.

Every bargraph path can be classified to belong to one of five classes, illustrated in figure 1. That is, every bargraph path is either (1) the single edge, or (2) starts in a horizontal edge, or (3) its last edge is horizontal, but it is primitive before this edge, or (4) it is primitive (and so its first and last edges are vertical), or (5) it is composed of a primitive bargraph path which returns a first time to the x-axis (where it must first step horizontally), before it continues as an arbitrary bargraph path. This classification produces equations (1) and (2).

Reference

[1] Prellberg T and Brak R 1995 Critical exponents from non-linear functional equations for partially directed cluster models *J. Stat. Phys.* **78** 701–30