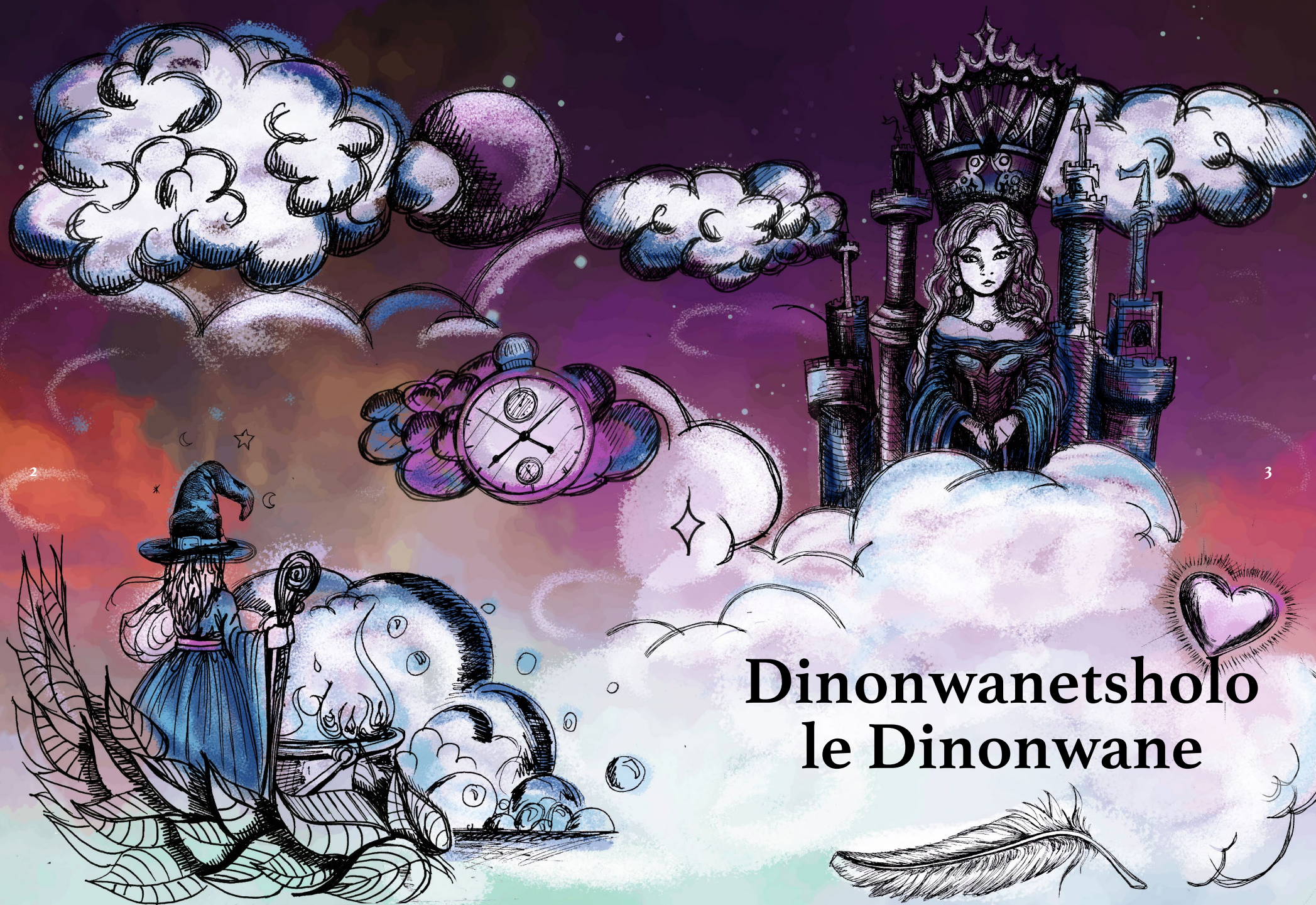
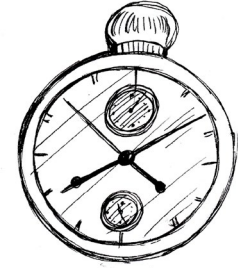




Dinonwanetsholo
le Dinonwane



Stationaryville le Barwarre ba Babedi

ka Lebogang Malebati

Kgale kgale, nageng ye kgole le ya boselamotse yeo e bitšwago Stationaryville, go be go dula barwarre ba babedi. Maina a barwarre e be e le $AR(1)$ le $AR(2)$ gomme e be e le karolo ya lapa la go ikgantšha la Autoregressive; lelapa leo le be le ikgantšha ka go se šute le šikenyege mo Stationaryville. Lapa la bona le be le rata gape go ba le nnete ka kakaretšo mo dulong.

$AR(1)$ e be e le yo mogolo go $AR(2)$. Barwarra ba be ba ratana kudu ebile ba be ba hlokomelana ka mehla. Ba be ba dira se sengwe le se sengwe mmogo. Ba be dira dilo ka moka mmogo. Ba be ba bapala mmogo, ba sega mmogo, ba eja mmogo, ebile e le bagwera ba bagolo.

Letšatši le lengwe morwarre yo mogolo, $AR(1)$, o boditše morwarre wa gagwe yo monnyane gore o nyaka go tšea leeto la Mohlwaela wa Nako le yena — leeto leo le sepelago ka nako. $AR(1)$ o boditše morwarre wa gagwe yo monnyane gore a sepele le yena ka gobane o lemogile gore ka moka ga bona ba kgona go sepela, seemo seo se sa dumelelwago mo Stationaryville. Ka gobane barwarre ba be rata go iteka mahlatse mmogo gomme ebile ba be ba nyaka go ya leetong la go nyaka go ema, $AR(2)$ o ile a tšea sephetho sa gore o tla tšea leetong le le botse la Mohlwaela wa Nako le Time-Series le morwarre wa gagwe.

Leeto le le be le tla leka tlhohleletšo ya bona le bohlae bja bona, ka gona barwarre ba be ba swanetše go lekola dilo tše dingwe ka bona pele ba sepela leeto la go iteka mahlatse. Barwarre ba be ba gopola gore ba swanetše go ba le nnete ka kakaretšo ka gobane ba tšwa lapeng la Autoregressive. Gape, ba be lemogile gore ba na le maatla a μ . Maatla a μ a bolela gore ba tla ba le boleng bjo bo lebelaganego bja μ . Gomme go se na taba gore ba be ba dira eng, boleng bja bona bjo bo letetšwego e be e tla ba μ .

Barwarre bao ba godišitšwego lapeng le tee, eupša ka dinako tše dintši ba a fapana. Barwarre ba ba be ba fapana ka nnete ka gore AR(1) o be a na le kgautšo o tee, gomme AR(2) o be a na le kgautšo tše pedi. Le ge go le bjalo, barwarre ba be ba tseba gore ba ka šomiša phapano ya bona go matlafatšana, gomme diphapano tše di be di tla ba thuša leetong la Mohlwaela wa Nako. Barwarre ba be ba tseba gore ge ba ka šomišana mmogo, ba be ba ka se kgonwe go thibilwa.

Ge barwarre ba tšea leeto la Mohlwaela wa Nako go hwetša go se šute, ba ile ba kgakgelwa lefaseng la Invertibility. Lefase la Invertibility le be le na le mohlokamedi yo bohlae yo a šireletšago maatla a lona. Na o ka akanya gore maatla ao e be e le afe? Ke Invertibility, ka tlhago. Barwarre ba boditše mohlokamedi gore ke ka lebaka la eng ba be ba le leetong leo, gomme ka ge mohlokamedi a be a le bohlae ebile a be a na le pelo ya botho, o ile a tšea sephetho sa go fa barwarre maatla a Invertibility.

Mohlokamedi o ba boditše: Ka ge le le ba lapa la Autoregressive, gomme ka ge ke bona ka moo le šomago ka maatla ka bobedi leetong la lena, ke tla le fa bobedi ba lena maatla a Invertibility. Efela le nkwe gabotse. Swaraganago mmogo bjalo ka barware gomme le šomiše maatla a lena a maswa ka bohlae.

Barwarre ba lebogile mohlokamedi gomme ba tloga nageng ya Invertibility go tšwela pele ka leeto la bona la Mohlwaela wa Nako. Ge barwarre ba tšwela pele leetong la bona ge nako e sepela, mafelelong ba fihlile Seferong sa Stationarity. Go šireletša sefero se le maatla a sona e be e le moloi o mobe yo a bitšwago Station-Nation. Station-Nation e be e le moloi o monnyane yo a bego a sa nyake go abelana maatla a gagwe ntle le ge maemo a gagwe a kgotsofatšwa.



E be e le moloi yo a bego a kgetha kudu - moloi yo a kgethago yo go lego bothata go mo kgotsofatša. Statistician o ile a kwa ka mathata a barwarre, ka mabarebare, gomme a thoma go ba nyatša.

Ke kwele gore lena bašemane ga le eme. Go tla bjang gore le se eme eupša le dule Stationaryville? Barwarre ba be ba tseba gore moloi o be a nepile, eupša ba mo mmotša gore ba tla dira se sengwe le se sengwe gore ba eme. Moloi o bone boikgafo bja bona bjalo ka sebaka sa go ba beela molaba.

Statistician o ba boditše: Ka ge lena ba babedi le le barwarre, eupša le fapana ka tsela tša lena, ka moka le na le maatla a g ikgetha. Le swanetše go šomiša maatla a a go ikgetha go le thuša go hwetša maatla a Stationarity. Ge le ka mpotša ka moo le ka šomišago maatla a, ke tla le fa mpho yeo le e nyakago. Eupša, ke a tseba gore le tla palelwa.

Le ge barwarre ba be ba tšhoga, ba ile ba amogela kabo ya moloi, gomme ba gopola seo batswadi ba bona ba ba boditšego ge e sa le bašemane: gore bobedi bja bona ba belegwe ka maatla a go ikgetha, maatla ao a ka ba dirago gore ba eme.

AR(2), a naganišiša ka pela, a nagana ka pela ka seo se ka mo dirago gore a eme. O boditše moloi gore dilo tše tharo di ka mo dira gore eme. AR(2) o boditše moloi, "Ge nka šomiša maatla a ϕ_1 le ϕ_2 , gona nka ema. Sa mathomo, ke swanetše go netefatša gore $\phi_2 + \phi_1 < 1$. Sa bobedi, ke swanetše go netefatša gore $\phi_2 - \phi_1 < 1$. Sa mafelelo, selo seo se dirago gore se be se botse kudu, ke gore - $1 < \phi_2 < 1$ ".

Moloi o ile a makatšwa ke gore AR(2) o fetile teko ya gagwe gomme a mo fa maatla a Stationarity.

Go be go le bothata go AR(1) go gopola maatla a gagwe, eupša ka hlohleletšo le thekgo ya moratho wa gagwe, o ile a gopola: "Aha, wena moradia, ke tseba maatla a ka. Gore ke eme, ke swanetše go šomiša maatla a ka a go netefatša gore - $1 < \phi < 1$."

Moloi o be a tseba gore morwarre o be a nepile, gomme ka gobane o be a tlangwa ke maatla a gagwe go phethagatša tšhepišo ya gagwe, le yena o ile a fa AR(1) maatla a Stationarity go AR(1).

Barwarre ba be ba thabile kudu gore ba fentše moloi gomme ba kgonne go hwetša maatla a Stationarity go tšwela pele ba phela ka Stationaryville. Ba ile ba boela gae ba phela ka lethabo Stationaryville.

