

Learning and using the tidyverse for historical research

@vivalosburros

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Lans des 1586 adi 17 decembris millo nouo In landra

Womfere Ende znoter ik gebede my hertelycken In v. L. goede
gratie dese voerleden daghen oner hollant hebbe ik v. L. mynen leeren
geexceuen ende hebbende de som dityt van Een Touchman Hays by
Boonof die op Enbden vaert hebbe met come laeten v. L. te aduerteren
dat ik op gherdere alsoo coteelo op de footmure was zyne walle weeghen
ben ik In Hays grenalle En hebbe de krote met L 2134/1/10e week
ghenoers En zoo mede de boecken vanden overfnyse En zoo oock de
boecken van martens Eyghen negotie Ende hebbe de selue al toe
ik meynden noch meer mede ghenome te hebbe dan my gebrac
sulpe Ende byt hebbe niet bouen $\frac{3}{4}$ bro byt gesadt want by twee jaels
Ende quamp En onerbied my zoo Datty my zonde doerdecken hebben
sadden ik niet geasfotert geworden want ik En hadde spelle scamp
En heeft wel 20 maal gestoren dat ik van gheene andere gande derue
zal als vande zyne maer selue is hem verleert En milord mayer
geesten doen liezen En daerboren borghe doen orelle datty my niet
sal misdoen En meynden my oock met vuyoten te slaen maer by
miden En werdte degelycken ontfanebaer mi de zaeken zyn wel
vergaen maer noet niet al gheeynt ik hebbe syn Eyghen boecken te
de boecken vant overfnyse geconfrontert En wy vnden datty alle onse
sculden ontfanghen heeft daer En faillert gheen L 300 die aen dat
goede schulden gerekent worden ik hebbe oock een zhye van L 540
van wille Edwarte genonden den weliken te lande vuyt geloopt
Is laet die selue tot onse lade draen En heeftse ontfanghen En by
selue niet te boecke In somma daer En gebrecks gheene vuythysyt



Power of coding



Just pick a project

How to draw an owl

1.



2.

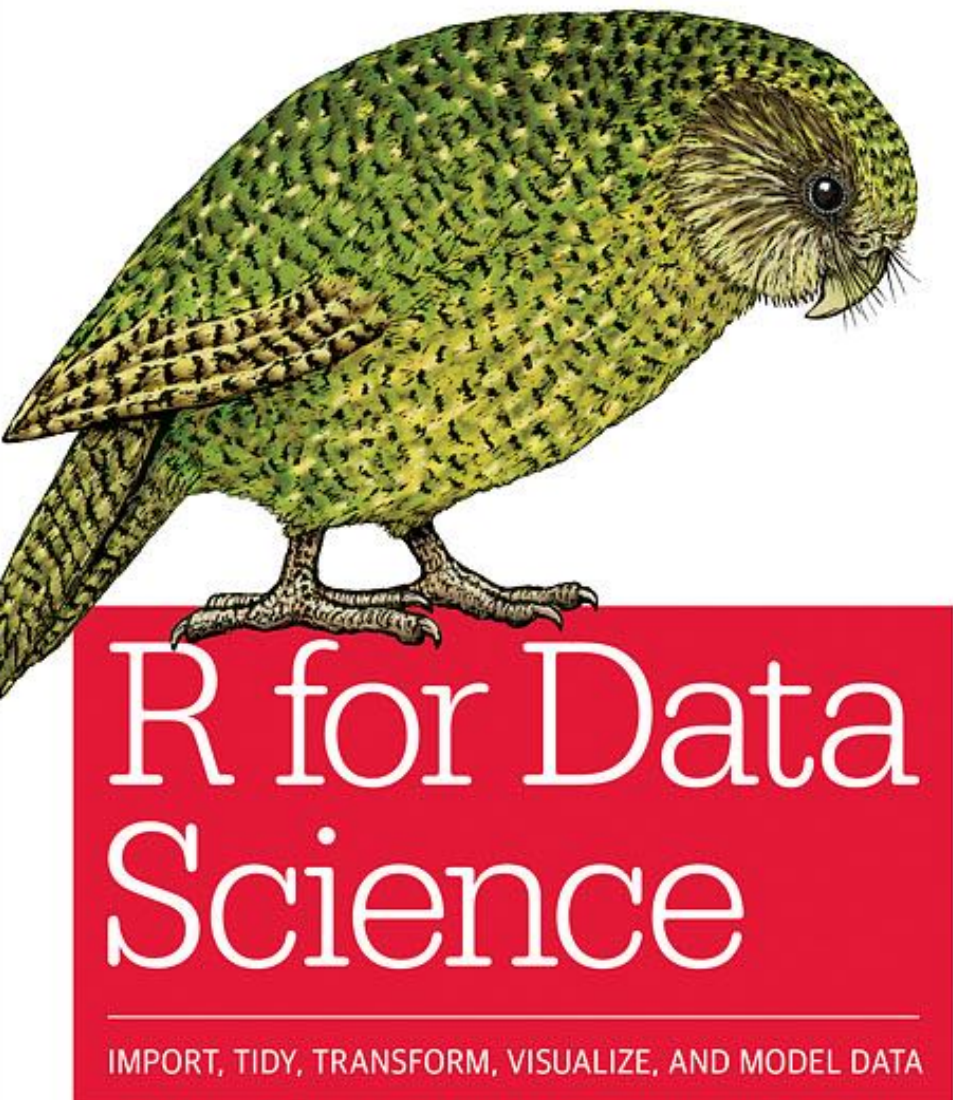


1. Draw some circles

2. Draw the rest of the fucking owl

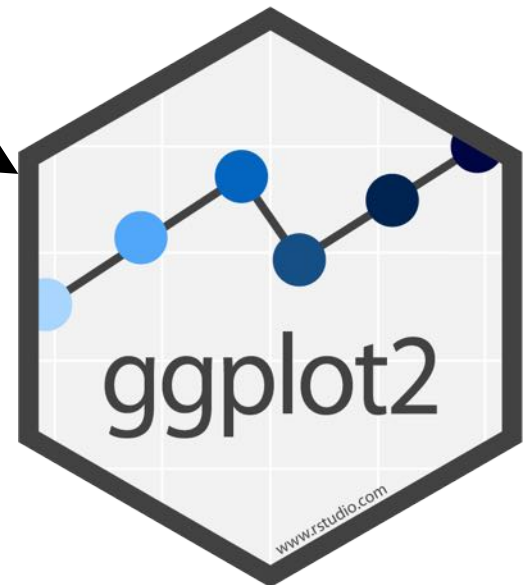
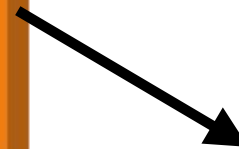
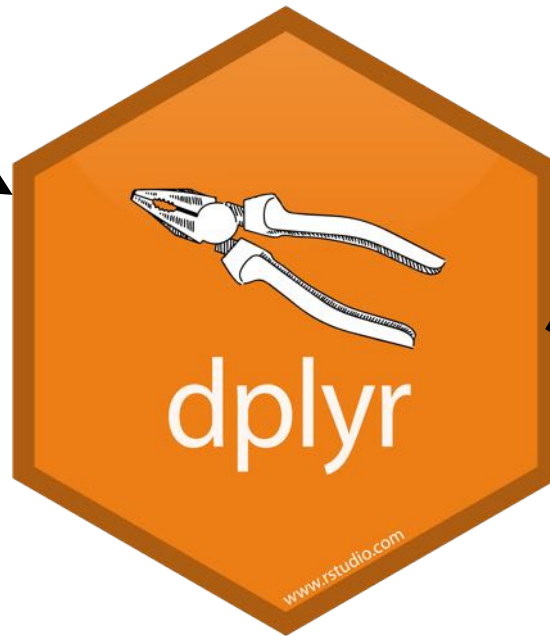
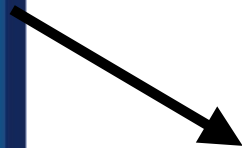


6,000 letters
sent to Daniel
van der Meulen
between 1578
and 1600



Garrett Grolemund
and
Hadley Wickham's
R for Data Science

Hadley Wickham &
Garrett Grolemund





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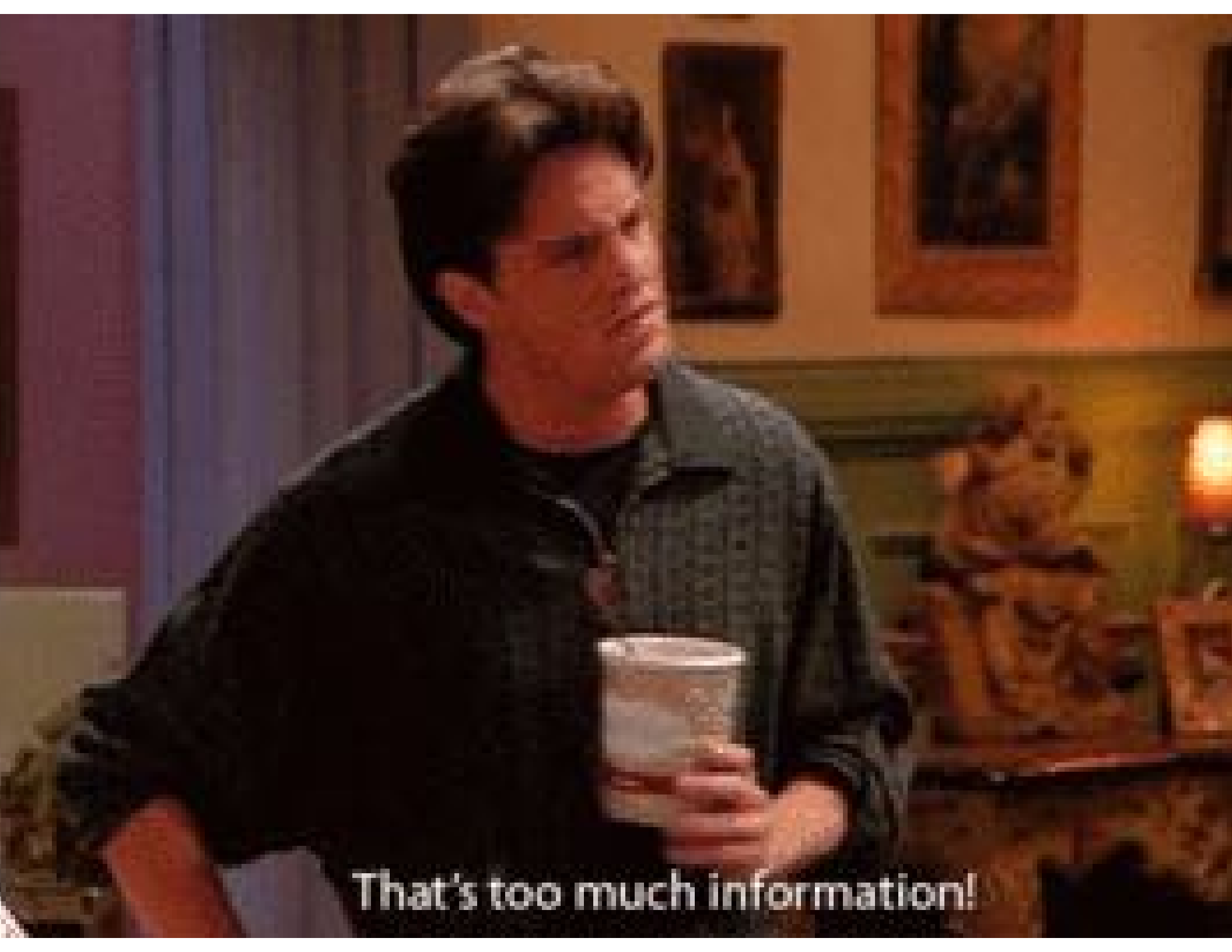
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Available CRAN Packages By Date of Publication



Date	Package	Title
2019-01-18	cumSeg	Change Point Detection in Genomic Sequences
2019-01-18	demography	Forecasting Mortality, Fertility, Migration and Population Data
2019-01-18	diffobj	Diffs for R Objects
2019-01-18	forecast	Forecasting Functions for Time Series and Linear Models
2019-01-18	haploR	Query 'HaploReg', 'RegulomeDB', 'LDlink'
2019-01-18	iotables	Importing and Manipulating Symmetric Input-Output Tables
2019-01-18	labelled	Manipulating Labelled Data
2019-01-18	NlcOptim	Solve Nonlinear Optimization with Nonlinear Constraints
2019-01-18	OpenMx	Extended Structural Equation Modelling
2019-01-18	palettesForR	GPL Palettes Copied from 'Gimp' and 'Inkscape'
2019-01-18	ParamHelpers	Helpers for Parameters in Black-Box Optimization, Tuning and Machine Learning
2019-01-18	QCA	Qualitative Comparative Analysis
2019-01-18	RKEEL	Using KEEL in R Code
2019-01-18	Rmosek	The R to MOSEK Optimization Interface



That's too much information!



`library(tidyverse)`



Jesse Sadler

A blog about early modern history and digital humanities

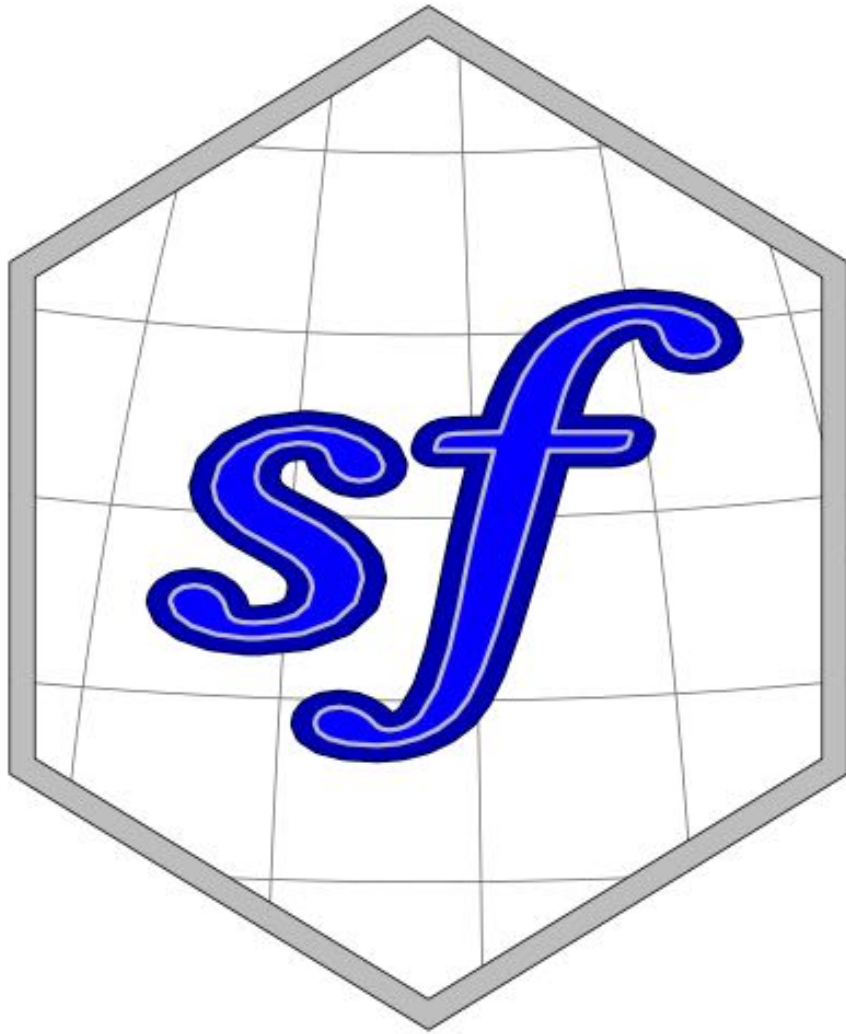
Introducing debkeepr

An R package for the analysis of non-decimal currencies

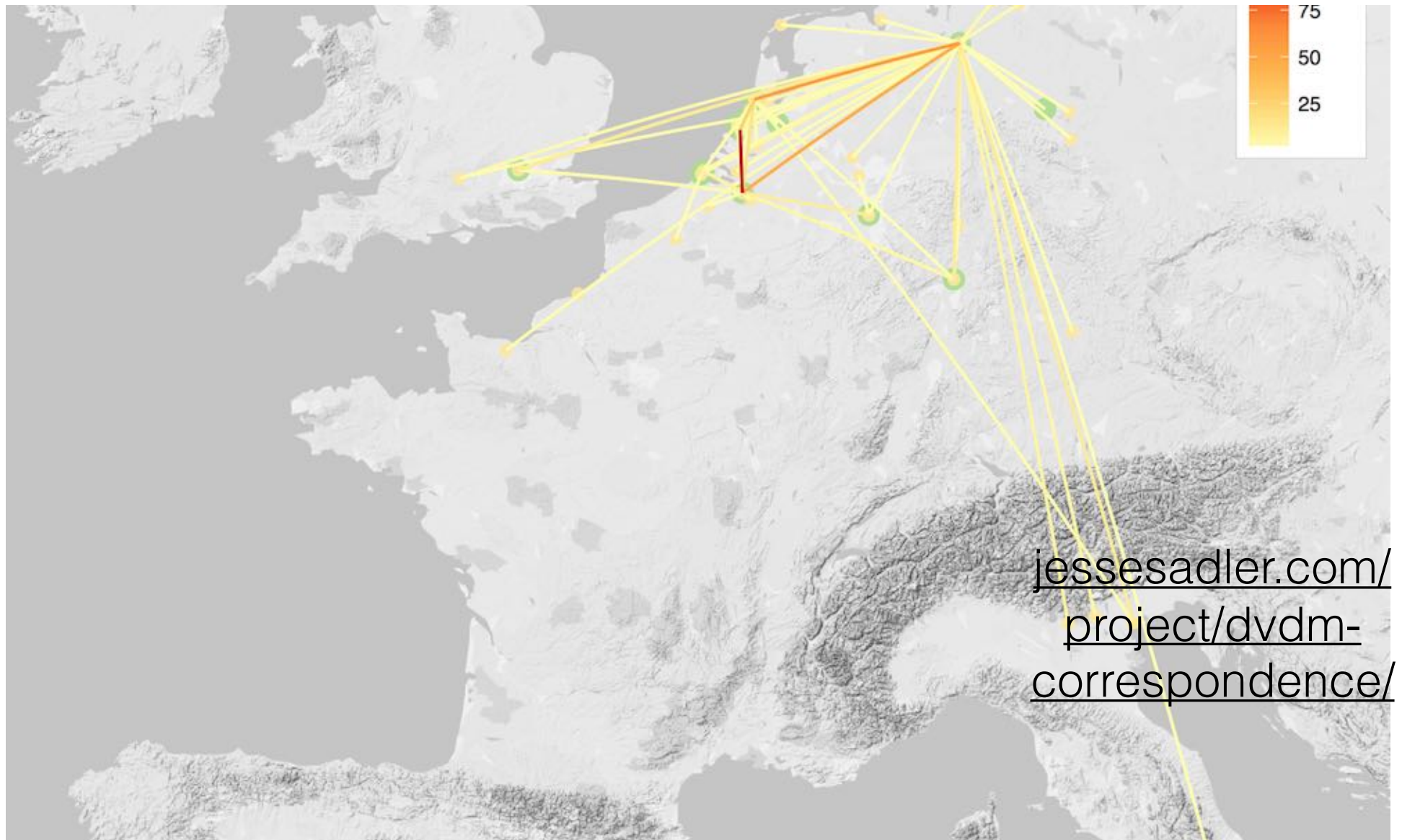
Posted on September 18, 2018

After an extensive period of iteration and a long but rewarding process of learning about package development, I am pleased to announce the release of my first R package. The package is called [debkeepr](#), and it derives directly from my historical [research on early modern merchants](#). `debkeepr` provides an interface for working with non-decimal currencies that use the tripartite system of pounds, shillings, and pence that was used throughout Europe in the medieval and early modern periods. The package includes functions to apply arithmetic and financial operations to single or multiple values and to analyze account books that use [double-entry bookkeeping](#) with the latter providing the basis for the name of `debkeepr`. In a later post I plan to write about the package development process, but here I want to discuss the motivation behind the creation of the package and provide some

Historical GIS with R



Letters received by Daniel van der Meulen, 1578–1591



debkeepr:

Analysis of non-decimal currencies

debkeepr **0.0.3.9000**

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debkeepr: Analysis of Non-Decimal Currencies

debkeepr provides an interface for working with non-decimal currencies that use the tripartite system of pounds, shillings, and pence. The package includes functions to apply arithmetic and financial operations to single or multiple values and to analyze account books that use either [single-entry bookkeeping](#) or [double-entry bookkeeping](#) with the latter providing the name for debkeepr.

Installation

You can install debkeepr from GitHub with devtools:

```
# install.packages("devtools")
devtools::install_github("jessesadler/debkeepr")
```

lsd Class

The pounds, shillings, and pence monetary system complicates even relatively simple arithmetic manipulations, as each unit has to be [normalized](#) or converted to the correct base. To unite pounds, shillings, and pence units into a single value and associate the shillings and pence units with non-decimal bases debkeepr implements a special class of R object. The **lsd** class consists of a list of one or more numeric vectors of length 3 and a `bases` attribute attached to the list. debkeepr provides functions to manipulate objects that can be coerced to class `lsd`, `lsd` objects on their own, or `lsd` list columns in a data frame.

Historical Background

Links

Browse source code at <https://github.com/jessesadler/debkeepr>

Report a bug at <https://github.com/jessesadler/debkeepr/issues>

License

[Full license](#)

MIT + file [LICENSE](#)

Developers

[Jesse Sadler](#)
Author, maintainer

Dev status

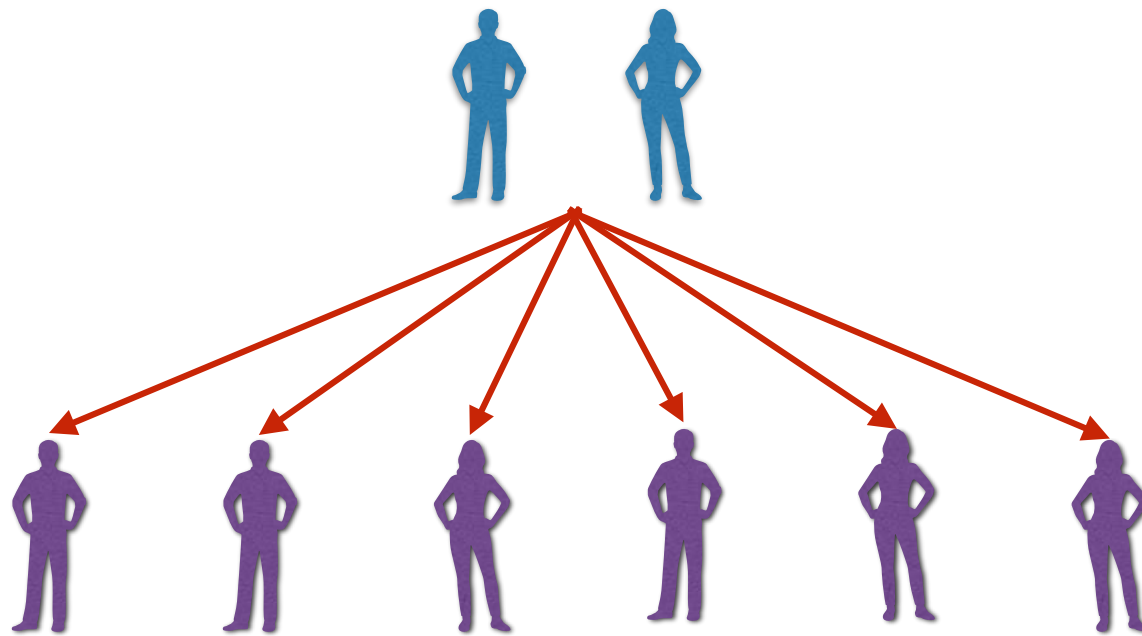
build passing

codecov 100%

jessesadler.github.io/debkeepr



Partible Inheritance



— + Anno 1585. —

Jacques de la faillie de jonghe. is — rediteur Ald 15 februarij 1585.									
26	4	0	voor oncofey van onse bruyloft voor so ^t veel luywaet a 10 p ^{de} een aen welken monnux. betaet ende 19 p. voor vracst van den Gofder met 7. parxhent rompt hanny. — — — — —	26	4	—			
—	—	0	0	0	voor de voorsp. voor scijpvracst van 30: Septer deela faillie met diuysse parxhent Int Vertuut van Dintvorp. — — — — —	0	—	—	
—	—	5	1	10	voor de voorsp. voor een sijnre scale wegen 11 Oct ^r 1585 ald 30: Septer deela faillie In octoer onregelaten. — — — — —	5	1	10	
—	—	28	10	0	voor de voorsp. voor 4. unen ruyzen wijn voor de bruyloft tot dort ydop rompt met de vaten. — — — — —	28	10	—	
—	—	4	7	0	voor de voorsp. voor diuysse lachten ende ruyzen ald 30: Septer deela faillie oick lange onregelaten. — — — — —	4	7	0	
—	—	3	6	9	4	voor de voorsp. voor een rekeninge van oncosse op de bruyloft geday als breeder bydesseu kenden is beynende. — — — — —	3	6	9
20	—	88	4	11	voor de voorsp. voor een rekeninge van ontopst tot besoene vande bruyloft by Jacques noiot In Dintvorp betaet. — — — — —	88	4	11	
—	—	15	100	10	voor de voorsp. voor soo veel ingan deela faillie voor de roudiute vande bruyloft wech. Int gach ende romen betaet. — — — — —	15	100	10	
—	—	2	18	6	voor de voorsp. voor soo veel lende timmerman voor opellen deelen ende ardeyt betaet. — — — — —	2	18	6	
—	—	0	3	4	voor de voorsp. voor vracst ende licent van een gheue anw alijn romende van londen. — — — — —	—	3	4	
10	—	155	1	4	voor tarwe In gunde van Robert noiot In Dintvorp voordat ick In 235. quartel tarwe geleds Int scijp de rooss de reys gemaect schiedt p ^{de} luy. — — — — —	155	1	4	

+ Anno 1585.

[illegible]

Non-decimal currency

1 pound = 20 shillings

1 shilling = 12 pence

Problems

- Arithmetic calculations are cumbersome

$$2.12.2 \frac{1}{2}$$

$$2.2 \frac{1}{2}$$

$$624.5$$

$$14642.12.2 \frac{1}{2}$$

$$14640$$

$$12.12 \frac{1}{2}$$

$$4537/4 =$$

$$126$$

$$1039 \frac{1}{2}$$

$$26512 \frac{1}{2}$$

$$52.12.13.1$$

$$1304$$

$$2 \frac{1}{2}$$

$$5.7.2 \frac{1}{2}$$

$$107$$

$$3241.5.9$$

$$533.6.8$$

$$3774.12.5$$

$$6.5$$

$$104$$

$$52$$

$$2102.13.7$$

$$2102.13.7$$

$$4205.72$$

$$1830.6.6$$

$$525.13.4 \frac{1}{16}$$

$$1304.13.1 \frac{8}{16}$$

$$1 \text{ part} = 1830.6.6 \frac{7}{16}$$

$$4 \text{ parts} = 7321.6.1 \frac{1}{4}$$

$$3 \text{ parts} = 5490.19.6 \frac{15}{16}$$

$$1134.8.1 \frac{1}{8}$$

Profits

Piorella

$$(94, 74b): 7168$$

Florette

$$(93, 72b) 4281$$

Naples

$$(66, 43a) 1314$$

Fire rough

$$(40, 20b) 782$$

Arclassa

$$(84, 86a) 34$$

Linen

Arclassa

$$(87, 89) 44$$

Linen

Linen

$$38.125$$

$$1.19.1 \frac{1}{2}$$

$$8$$

$$8$$

$$3.2$$

$$89.3.5$$

$$18.0$$

7009. Silk

$$13,626.4.5$$

$$45000$$

$$300$$

$$17.7 \frac{1}{4}$$

$$44694$$

$$24 \frac{3}{4}$$

Winninge ende Verlies

Debit 324.2

$$324.16.0$$

$$100$$

$$90.10.9$$

$$10.16.8$$

$$39.16.33$$

$$0.3.1 \frac{1}{2}$$

$$0.4.5$$

$$4.6.13$$

$$6.8.20.1 \frac{1}{2}$$

Small Debit

$$171.3.0.2$$

$$22880.15.0 \frac{1}{2}$$

$$3584.17.4$$

$$28178.12.6 \frac{1}{2}$$

Same on Both Credit and debit

Small Debit + Business expenses =

$$5297.17.6$$

Problems

- Arithmetic calculations are cumbersome
- How to deal with tripartite non-decimal values in a data base

Problems in R

- Three separate units make up one value
- The units have non-decimal bases
- The bases may be different when a value is transferred to another currency

l s d

libra solidus denarius

(pound) (shilling) (penny)

lsd class

- £10 18s. 4d. = `c(10, 18, 4)`
- bases attribute: `c(20, 12)`
- lsd objects are stored as lists

lsd class

```
> deb_as_lsd(lsd = c(10, 18, 4),  
             bases = c(20, 12))
```

```
##           l   s   d
```

```
## [1] 10 18 4
```

Input as three variables

```
> transactions
```

```
# A tibble: 2,155 x 6
```

	credit	debit	date	l	s	d
	<dbl>	<dbl>	<date>	<dbl>	<dbl>	<dbl>
1	1	3	1582-11-08	0	0	1
2	1	4	1582-11-08	0	0	1
3	1	5	1582-11-08	0	0	1
4	1	6	1582-11-08	17	17	6
5	1	7	1582-11-08	10	4	0
6	1	8	1582-11-08	0	15	2
7	1	9	1582-11-08	16	4	10

lsd list column

```
> deb_lsd_gather(transactions, replace = TRUE)
```

```
# A tibble: 2,155 x 4
```

	credit	debit	date	lsd
	<dbl>	<dbl>	<date>	<S3: lsd>
1	1	3	1582-11-08	0, 0, 1
2	1	4	1582-11-08	0, 0, 1
3	1	5	1582-11-08	0, 0, 1
4	1	6	1582-11-08	17, 17, 6
5	1	7	1582-11-08	10, 4, 0
6	1	8	1582-11-08	0, 15, 2
7	1	9	1582-11-08	16, 4, 10
8	1	10	1582-11-08	11, 5, 0

Normalization

```
> deb_normalize(c(21,
48, 28))
```

```
##           l   s   d
## [1] 23 10 4
```

$2.12.2 \frac{1}{2}$ $4537/4 =$
 $2.2 \frac{1}{2}$ 126
 624.5
 $14642.12.2 \frac{1}{2}$ $1039 \ 0 \ 7$
 14640 $26512 \ 6$
 $12.12 \frac{1}{2}$ $52. \ 1291.13.1$
 1304
 $2 \ \frac{1}{2}$
 $5.7.2 \frac{1}{2}$ $48 \ 50$ $3241.5.9$
 $533.6.8$
 107 $3774.12.5$
 6.5
 $104 \ 52$ 1
 ~~$1830.6.6$~~ $2102.13.7$
 $525 \ 13.4 \ 13/16$ $2102 \ 137$
 $1304 \ 13.1 \ 8/16$ $4205 \ 72$

 $1 \text{ part} = 1830.6.6 \ 7/16$
 $4 \text{ parts} = 7321.6.1 \ 1/4$
 $3 \text{ parts} = 5490.19.6 \ 15/16$

 $1134.8.1 \ 1/8$

$$2.12.2 \frac{1}{2}$$

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$$624.5$$

$$14642.12.2 \frac{1}{2}$$

$$14640$$

$$12.12 \frac{1}{2}$$

$$4537/4=$$

$$126$$

$$1039 \frac{1}{2}$$

$$26512 \frac{1}{2}$$

$$52.$$

$$1291.13.1$$

$$1304$$

$$2 \frac{1}{2}$$

$$48$$

$$50$$

$$5.7.2 \frac{1}{2}$$

$$3241.5.9$$

$$533.6.8$$

$$3774.12.5$$

$$107$$

$$6.5$$

$$104$$

$$52$$

$$2102.13.7$$

$$2102.13.7$$

$$4205.72$$

$$1830.6.6$$

$$525.13.4$$

$$1304.13.1$$

$$13/16$$

$$8/16$$

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$$4 \text{ parts} = 7321.6.1 \frac{1}{4}$$

$$3 \text{ parts} = 5490.19.6 \frac{15}{16}$$

$$1134.8.1 \frac{1}{8}$$

Addition

```
> deb_sum(c(10, 14, 8),
           c(5, 18, 11),
           c(6, 16, 9))
```

```
##          l  s  d
## [1] 23 10 4
```

RULE II. "If the multiplier be a composite number, whose component parts do not exceed 12, multiply first by one of these parts, then multiply the product by the other. Proceed in the same manner if there be more than two."

Ex. 1st.] L. 15 3 8 by 32 = 8×4
8

—————
L. 121 9 4 = 8 times.
4

—————
L. 485 17 4 = 32 times.

2d.] L. 17 3 8 by 75 = $5 \times 5 \times 3$
3

—————
L. 51 11 — = 3 times.
5

—————
L. 257 15 — = 15 times.
5

—————
L. 1288 15 — = 75 times..

Multiplication

Multiply £15 3s. 8d.
sterling by 32

```
> deb_multiply(c(15, 3, 8),  
                x = 32)
```

```
##           l   s   d  
## [1] 485 17 4
```

RULE I. " When the dividend only consists of
 " different denominations, divide the higher deno-
 " mination, and reduce the remainder to the next
 " lower, taking in (p. 296. Rule V.) the given num-
 " ber of that denomination, and continue the divi-
 " sion."

Examples.

Divide L. 465 : 12 : 8
 by 72.

L.	s.	d.	L.	s.	d.
72) 465	12	8	(6	9	4
432	..	.			
<hr/>					
33					
20					
<hr/>					
72) 672					
648					
<hr/>					
24					
12					
<hr/>					
72) 296					
288					
<hr/>					
8	Rem.				

Or we might divide by
 the component parts of
 72, (as explained under
Thirdly, p. 298).

Divide 345 cwt. 1 q. 8 lb.
 by 22.

Cwt.	q.	lb.	Cwt.	q.	lb.
22) 345	1	8	(15	2	21
22	..	.			
<hr/>					
125					
110					
<hr/>					
15					
4					
<hr/>					
22) 61					
44					
<hr/>					
17					
28					
<hr/>					
144					
34					
<hr/>					
22) 484					
44					
<hr/>					
44					
44					
<hr/>					
0					

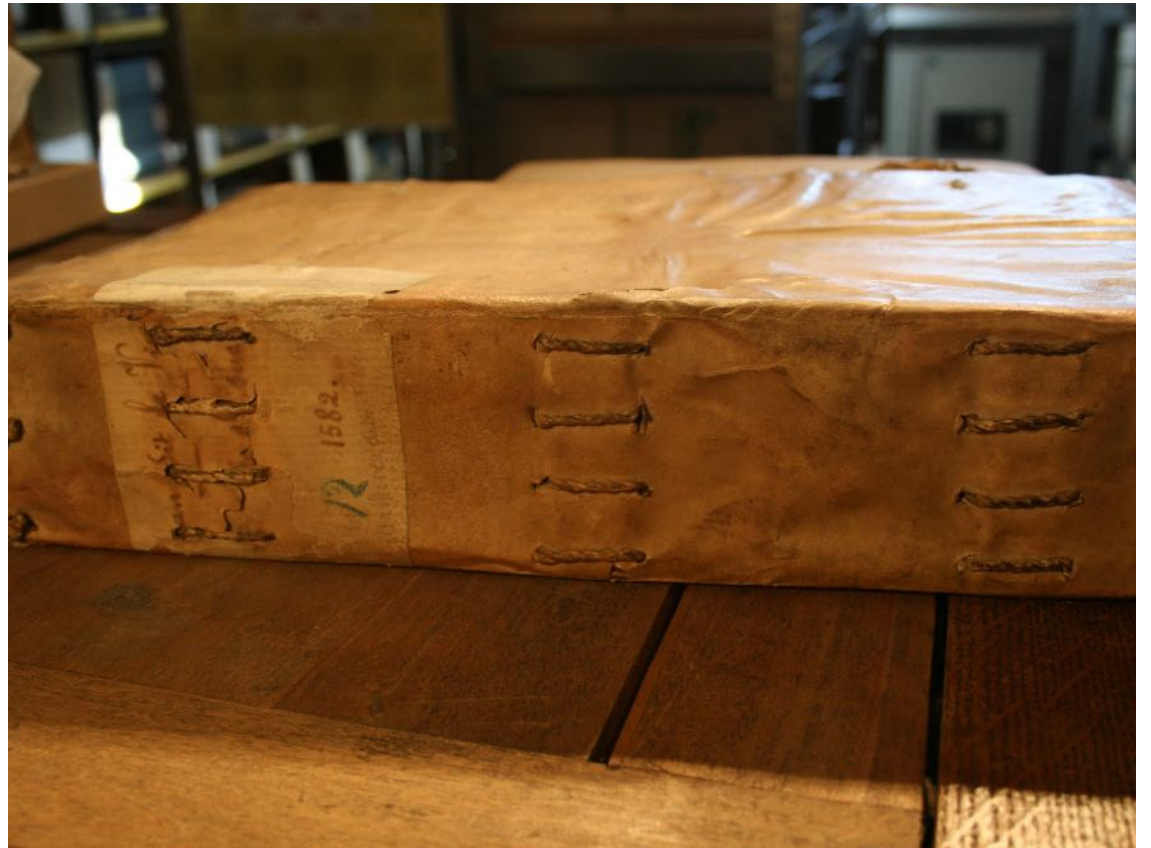
Division

Divide 345cwt. 1q. 8lbs.
 by 22

```
> deb_divide(c(345, 1, 8),
              x = 22,
              bases = c(4, 28))
```

```
##           l  s  d
## [1] 15  2 22
```


Jan della Faille de Oude,
(c. 1515–1582)



laarw van £ 327: 9: 9: vuytgerich gemaect
vonder pro Memorie

laarw Item Cristalyne spiegelstaet
fo: voors debiteurs van £ 216: 4: 0:

Indeche Snyts debet fo: voors ge
augmentéert voort op 21. octobris
1603: ad: cassa/voort on do snyts
spiegelcasson voocht van Robuigt
van et hénch ende diuersé ander
casson gerocht van Meleghor der
nyes spiegelmaecker £ 25: 0: 3:

Doet tsam: de so van £ 241: 12: 11:

Daer tegen de selue spiegel fo:
voors crediten staet op 16 nouemb
1603: x vonagie van Londer voort
vercoepinge tot Londer van 44:
do snyts spiegel bedraegende hobbé
£ 33: 7: 10: sterlinc a 31/3/1603
vlemb £ 51: 15: 3:

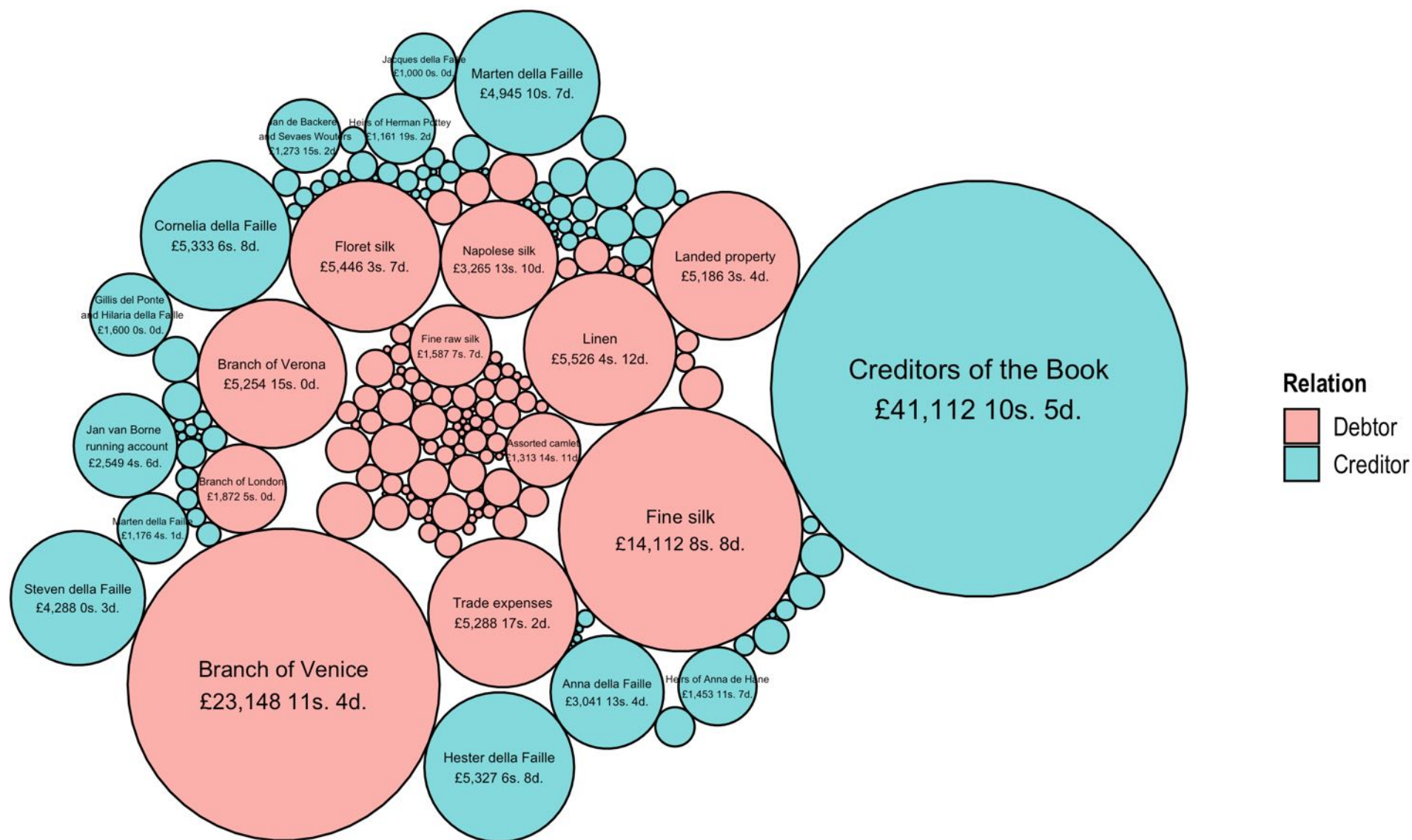
Maer gemect & goor £ 51: 15: 3:

Accounts of the estate of Jan della Faille de Oude

- Date: 8 November
1582 to 31
December 1594
- 2,155 transactions
- 480 accounts

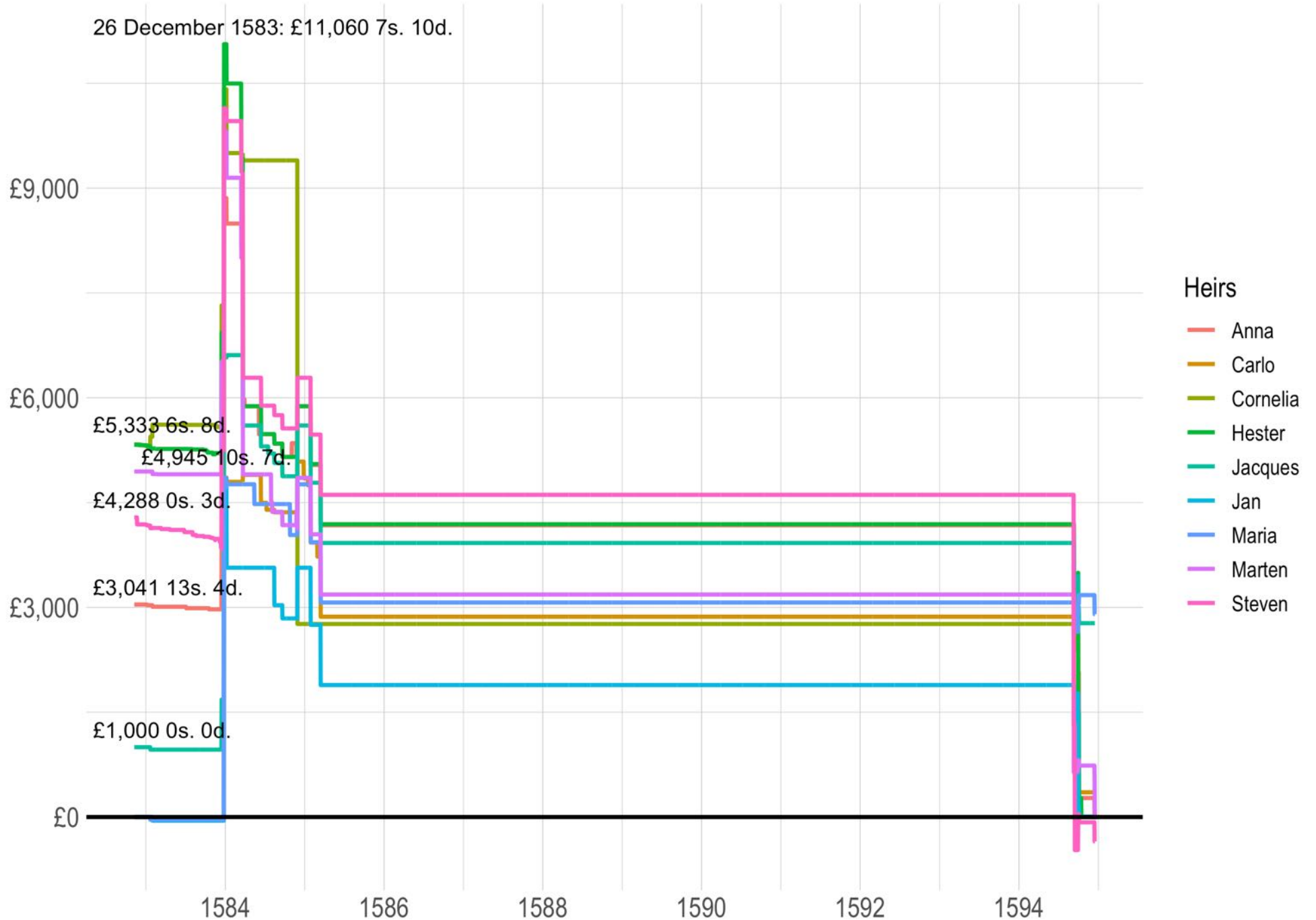
Value of accounts in the estate of Jan della Faille de Oude, 8 December 1582

Opening value of the estate: £82,813 5s. 8d.



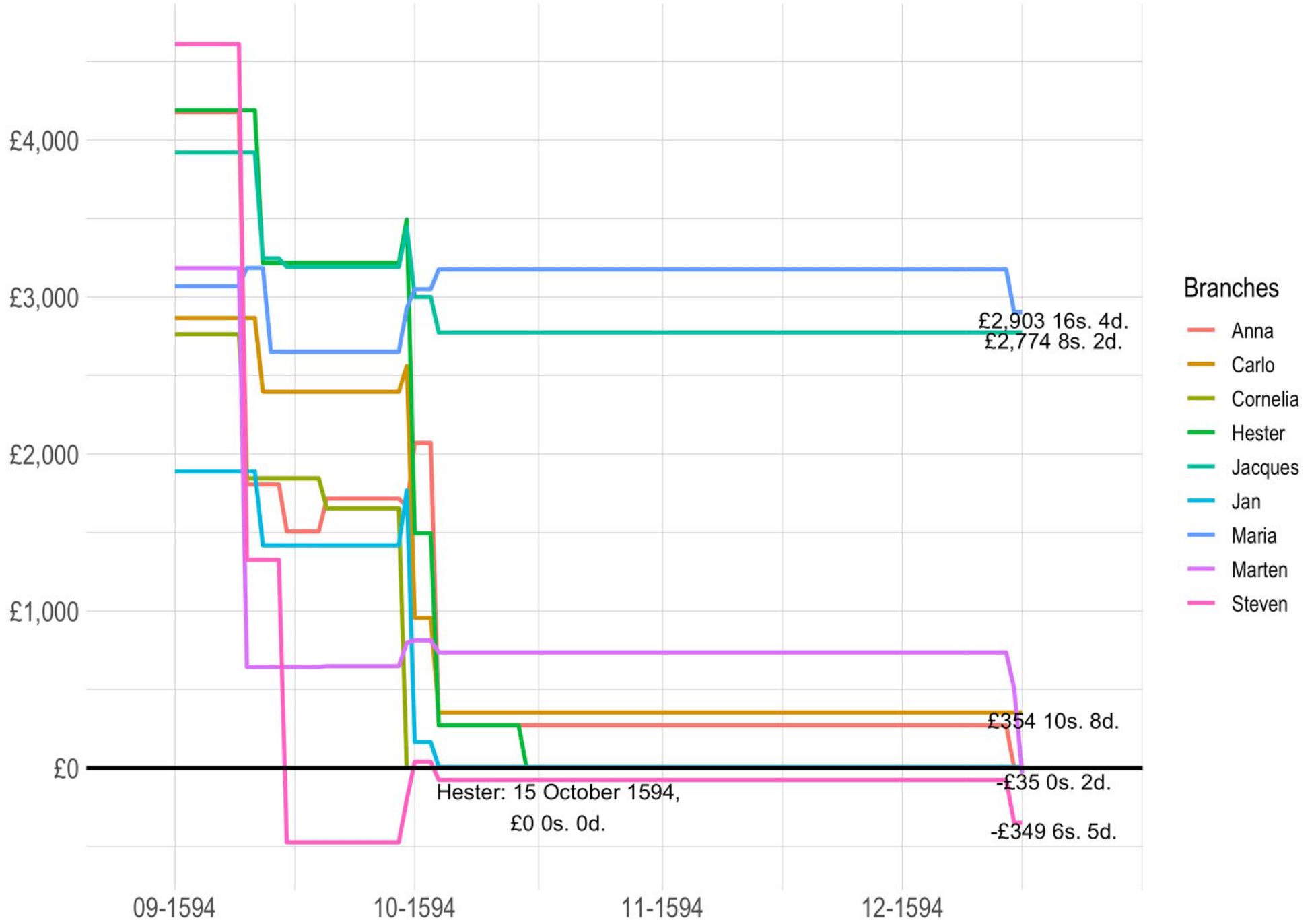
Inheritance due to the heirs of Jan de Oude

Estate of Jan della Faille de Oude, 1582–1594

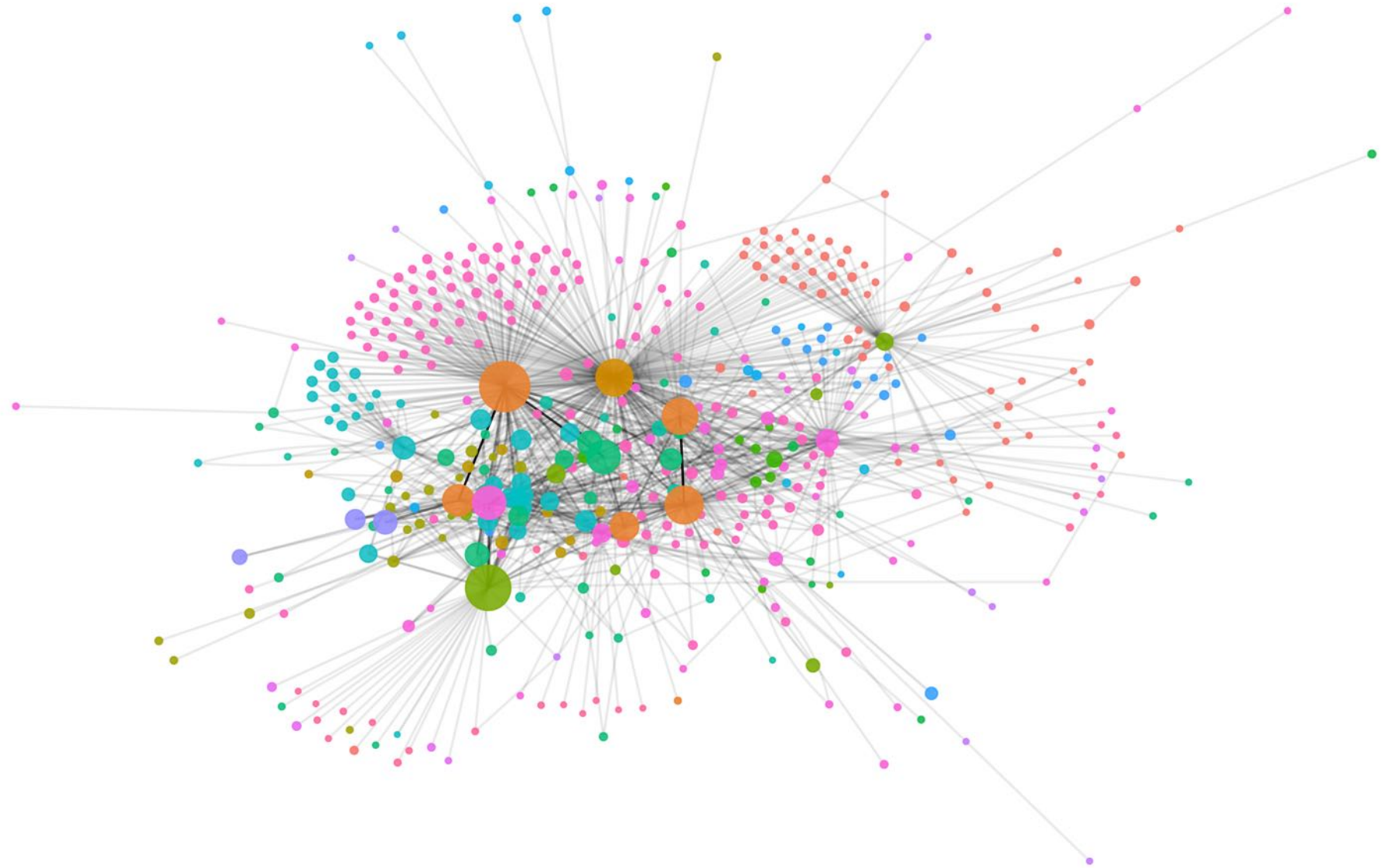


Inheritance due to the heirs of Jan de Oude

September 1594 to 16 December 1594



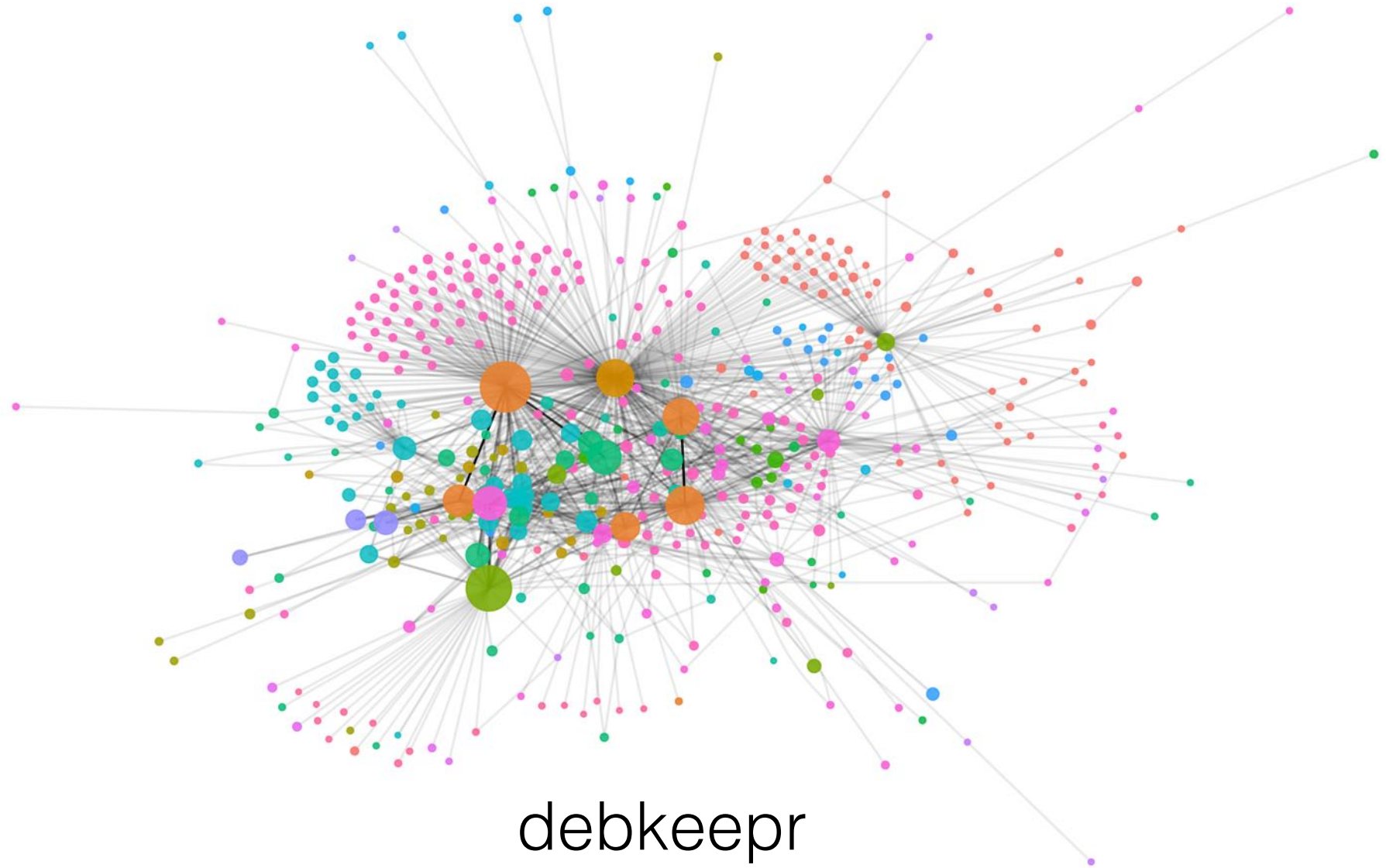
Estate of Jan della Faille de Oude, 1582–1594



Account types

- | | | | | | | | | | |
|-------------|--------|-------|---------|--------------------|---------------|-----------|---------|--------|-------------|
| Bequest | Branch | Cassa | Company | Erffgoed | Estate | Factor | Giovane | Goods | Heir |
| Inheritance | Kin | Law | Loan | London Inheritance | Miscellaneous | Political | Trade | Wissel | Written off |

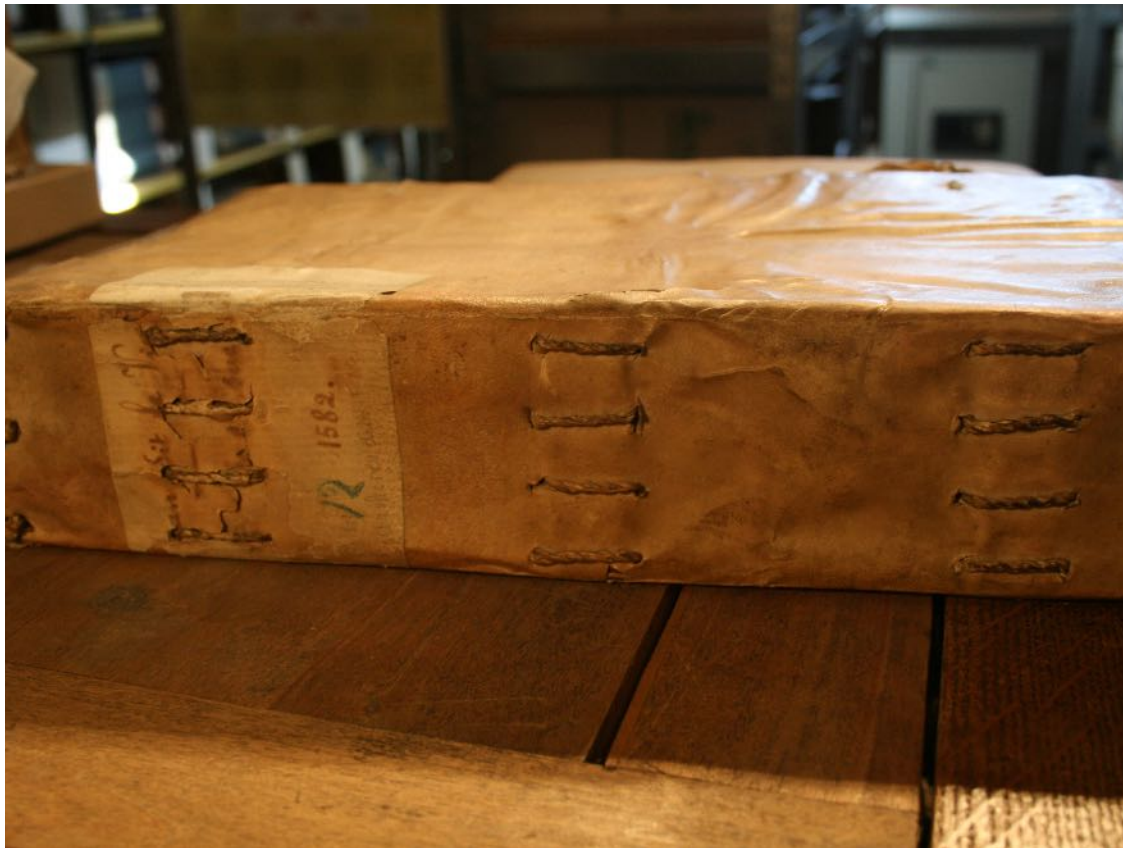
Estate of Jan della Faille de Oude, 1582–1594



debkeepr
jessesadler.github.io/debkeepr

Account types

Bequest	Branch	Cassa	Company	Erffgoed	Estate	Factor	Giovane	Goods	Heir
Inheritance	Kin	Law	Loan	London Inheritance	Miscellaneous	Political	Trade	Wissel	Written off



Thank you

Jesse Sadler

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