Ingesting object data from a BIO excel file

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Introduction

There is a .R file here in which I tried to decode things automatically. This proved very difficult, because the meanings of things were (I think) indicated by colour underlays. Also, there were *lots* of weird things in the file, like text in numeric fields, negative lengths, etc. In the end, I decided that hand-editing would be superior.

I used lower-case, which is easier to type, and fits with the Dewey names. I also removed the `"` symbols, which are hard to type in code, and appear in some instances and not in others.

Details

wires_bio.csv

There are just two listings.

Buoyancy/metre

The 3/16 case has -0.76 in a column named "W Nt/m", so I've converted that to -0.76/9.8=-0.0776 (rounded to 4 places), to get kg/m instead of N/m.

There is no listing for the 1/4 case, but I estimated (guessed) that as

```
round(-0.0776 * ((4/16)/(3/16))^2, 4)
```

```
## [1] -0.138
```

This is based on an assumption that the metal inside is similar, etc.

Diameter

For the diameter, I looked at the column labeled `A (m*2/m)`. I assume that is the horizontally-projected area. To test that, I computed

```
16*c(0.00635,0.0079375)/0.0254
```

```
## [1] 4 5
```

which yields the expected, for the outside diameters in 16-ths of inch.

CD

There are no entries in the file and I did not know what `DRAG -N` and `DRAG -T` meant and so I just used the value $C_D = 1.3$, used in Dewey's work.

Result for wire

```
knitr::kable(read.csv("wires_bio.csv"))
```

name	buoyancy	height	width	diameter	CD	code	source
3/16 galvanized wire coated to 1/4	-0.0775	1	0.0063500	0	1.3	NA	BIO
1/4 galvanized wire coated to 5/16	-0.1380	1	0.0079375	0	1.3	NA	BIO

`floats_bio.csv`

These seem to be in the yellow-background part of the spreadsheet. The first of these, named `"new glass streamlined float"`, has no listed weight in pounds or newtons, so I ignored that entry.

For buoyancy, I took `NEWTONS` (col E) and divided by 9.8m/s^2 to get kg, rounding to 2 digits after the decimal place.

```
N <- c(445,285,560,516,429,773,414,1886,3963,4030,2095,8224,7740)
round(N/9.8, 2)
```

```
##  [1]  45.41  29.08  57.14  52.65  43.78  78.88  42.24 192.45 404.39 411.22
## [11] 213.78 839.18 789.80
```

There are two length columns in the file, but the values are either identical or relatable by rounding, so I could choose either. But is that in the x or the y direction?

Two columns contain things related to area, one with name `A (m*2/m)` and other with name `AW (m*2)`. I think the former is the projected area per meter of z (as it is for wires). So, if we assume that the length is in the z direction, or that the object is roughly spherical, we can infer what the package needs, namely `height` and `width`, from the ratio of the second area to the first length. Whether that's sensible, I just don't know.

```
A<-c(0.164,0.5,0.073,0.5,0.164,1.5,1.5,1.86,2.84,2.474,1.67,2.7,2.7)
L<-c(0.74,0.563,1,0.563,1.187,1,1,1.286,1.286,1.286,1.286,2.42,2.42)
round(A/L,3)
```

```
##  [1] 0.222 0.888 0.073 0.888 0.138 1.500 1.500 1.446 2.208 1.924 1.299 1.116
## [13] 1.116
```

```
knitr::kable(read.csv("floats_bio.csv"))
```

name	buoyancy	height	width	diameter	CD	code	source
streamlined bub 2 x 17 glass	45.41	0.740	0	0.222	0.65	NA	BIO
a2 package adcp and 2 viny balls	29.08	0.563	0	0.888	0.65	NA	BIO
3 pack viny 12b-3 floats	57.14	1.000	0	0.073	0.65	NA	BIO
streamlined bub 3 viny balls	52.65	0.563	0	0.888	0.65	NA	BIO
bub 2x17 glass	43.78	1.187	0	0.138	0.65	NA	BIO
ips / 2x b3 subs assembly	78.88	1.000	0	1.500	0.65	NA	BIO
adcp / 2x c3 subs assembly	42.24	1.000	0	1.500	0.65	NA	BIO
stablemoor 533 lb 3500 msw with adcp	192.45	1.286	0	1.446	0.65	NA	BIO
stablemoor 1000 lb 3500 msw with adcp	404.39	1.286	0	2.208	0.65	NA	BIO
stablemoor 1015 lb 1500 msw with adcp	411.22	1.286	0	1.924	0.65	NA	BIO
stablemoor 580 lb 1500 msw with adcp	213.78	1.286	0	1.299	0.65	NA	BIO
syntactic float with adcp bracket	839.18	2.420	0	1.116	0.65	NA	BIO
syn. float,bracket and 109 lb.adcp	789.80	2.420	0	1.116	0.65	NA	BIO

`releases_bio.csv`

`height`

Use `LENGTH` (col C).

`buoyancy`

Use the negative of `NEWTONS` (col E), divided by g=9.8m/s^2, rounded to 2 decimal places.

```
N <- c(149, 253.5, 360, 129, 273, 118.7)
round(N/9.8, 2)
```

```
## [1] 15.20 25.87 36.73 13.16 27.86 12.11
```

`width`

Use the ratio of `A (m&2/m)` (col G) to `LENGTH` (col C).

```
G <- c(0.14,0.14,0.127,NA,0.112,0.199,0.237)
C <- c(1.194,1.32,1.23,0.479,0.68,1,0.4)
width <- round(G/C, 4)
```

Note the `NA` value – this is "benthos 875 release", which we will not use here, since there's no point in guessing. (Put another way, if someone at BIO wants to take a measuring tape to that thing to find it's diameter, we'll incorporate it!)

`CD`

Use 0.65, i.e. Dewey's value for floats, on the assumption that the two might be similar.

Result for releases

```
knitr::kable(read.csv("releases_bio.csv"))
```

name	buoyancy	height	width	CD	code	source
eg&g 723a	-15.20	1.194	0.1173	0.65	NA	BIO
eg&g 723a with tension bar	-25.87	1.320	0.1061	0.65	NA	BIO
benthos 965a release	-36.73	1.230	0.1033	0.65	NA	BIO
benthos 966a and 866a release	-13.16	0.680	0.1647	0.65	NA	BIO
benthos 865a releas 1	-27.86	61.250	0.1990	0.65	NA	BIO
vr2w release with float collar	-12.11	0.400	0.5925	0.65	NA	BIO