

# My Report

Chung-I LI

2024-09-13

## Table of contents

Summary Staistic	1
Table 1	24
Missing Values	27
Penguin mass vs. flipper length	60
flipper_hist	61
Flipper lengths boxplots + jitter	62

## Summary Staistic

```
library(Hmisc)
```

Warning: 'Hmisc' R 4.2.2

lattice

survival

Formula

ggplot2

Warning: 'ggplot2' R 4.2.3

'Hmisc'

'package:base':

format.pval, units

```
library(palmerpenguins)
```

Warning: 'palmerpenguins' R 4.2.3

```
data(package = 'palmerpenguins')  
latex(describe(penguins), file = "", caption.placement = "top")
```

## penguins 8 Variables 344 Observations

### species

n	missing	distinct
344	0	3

Value	Adelie	Chinstrap	Gentoo
Frequency	152	68	124
Proportion	0.442	0.198	0.360

### island

n	missing	distinct
344	0	3

Value	Biscoe	Dream	Torgersen
Frequency	168	124	52
Proportion	0.488	0.360	0.151

### bill\_length\_mm

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
342	2	164	1	43.92	6.274	35.70	36.60	39.23	44.45	48.50	50.80	51.99

lowest : 32.1 33.1 33.5 34.0 34.1, highest: 55.1 55.8 55.9 58.0 59.6

### bill\_depth\_mm

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
342	2	80	1	17.15	2.267	13.9	14.3	15.6	17.3	18.7	19.5	20.0

lowest : 13.1 13.2 13.3 13.4 13.5, highest: 20.7 20.8 21.1 21.2 21.5

### flipper\_length\_mm

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
342	2	55	0.999	200.9	16.03	181.0	185.0	190.0	197.0	213.0	220.9	225.0

lowest : 172 174 176 178 179, highest: 226 228 229 230 231

### body\_mass\_g

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
342	2	94	1	4202	911.8	3150	3300	3550	4050	4750	5400	5650

lowest : 2700 2850 2900 2925 2975, highest: 5850 5950 6000 6050 6300

### sex

n	missing	distinct
333	11	2

Value	female	male
Frequency	165	168
Proportion	0.495	0.505

### year

n	missing	distinct	Info	Mean	Gmd
344	0	3	0.888	2008	0.8919

Value	2007	2008	2009
Frequency	110	114	120
Proportion	0.320	0.331	0.349

```
latex(describe(penguins_raw), file = "", caption.placement = "top")
```

```
\begin{spacing}{0.7}
\begin{center}\textbf{ penguins\_raw \\ 17 Variables~~~~~ 344 ~0bservations}\end{center}
\smallskip\hrule\smallskip{\small
\vbox{\noindent\textbf{studyName}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.
\put(0,0){\line(0,1){92}}
\put(500,0){\line(0,1){95}}
\put(1000,0){\line(0,1){100}}
\end{picture}
\end{picture}}
```

```

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
344&0&3 \end{tabular}
\begin{verbatim}

Value      PAL0708 PAL0809 PAL0910
Frequency   110     114     120
Proportion  0.320   0.331   0.349
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Sample Number}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1
\put(0,0){\line(0,1){33}}
\put(19,0){\line(0,1){33}}
\put(39,0){\line(0,1){100}}
\put(58,0){\line(0,1){33}}
\put(78,0){\line(0,1){100}}
\put(97,0){\line(0,1){33}}
\put(117,0){\line(0,1){100}}
\put(136,0){\line(0,1){33}}
\put(156,0){\line(0,1){100}}
\put(175,0){\line(0,1){33}}
\put(195,0){\line(0,1){100}}
\put(214,0){\line(0,1){33}}
\put(234,0){\line(0,1){100}}
\put(253,0){\line(0,1){33}}
\put(273,0){\line(0,1){100}}
\put(292,0){\line(0,1){33}}
\put(312,0){\line(0,1){100}}
\put(331,0){\line(0,1){33}}
\put(351,0){\line(0,1){100}}
\put(370,0){\line(0,1){33}}
\put(390,0){\line(0,1){100}}
\put(409,0){\line(0,1){33}}
\put(429,0){\line(0,1){100}}
\put(448,0){\line(0,1){33}}
\put(468,0){\line(0,1){100}}
\put(487,0){\line(0,1){33}}
\put(506,0){\line(0,1){100}}
\put(526,0){\line(0,1){33}}

```

```

\put(545,0){\line(0,1){100}}
\put(565,0){\line(0,1){33}}
\put(584,0){\line(0,1){100}}
\put(604,0){\line(0,1){33}}
\put(623,0){\line(0,1){100}}
\put(643,0){\line(0,1){33}}
\put(662,0){\line(0,1){89}}
\put(682,0){\line(0,1){22}}
\put(701,0){\line(0,1){67}}
\put(721,0){\line(0,1){22}}
\put(740,0){\line(0,1){67}}
\put(760,0){\line(0,1){22}}
\put(779,0){\line(0,1){67}}
\put(799,0){\line(0,1){22}}
\put(818,0){\line(0,1){67}}
\put(838,0){\line(0,1){22}}
\put(857,0){\line(0,1){67}}
\put(877,0){\line(0,1){22}}
\put(896,0){\line(0,1){67}}
\put(916,0){\line(0,1){22}}
\put(935,0){\line(0,1){67}}
\put(955,0){\line(0,1){22}}
\put(974,0){\line(0,1){67}}
\put(994,0){\line(0,1){22}}
\put(1013,0){\line(0,1){67}}
\put(1032,0){\line(0,1){22}}
\put(1052,0){\line(0,1){67}}
\put(1071,0){\line(0,1){22}}
\put(1091,0){\line(0,1){67}}
\put(1110,0){\line(0,1){22}}
\put(1130,0){\line(0,1){67}}
\put(1149,0){\line(0,1){22}}
\put(1169,0){\line(0,1){67}}
\put(1188,0){\line(0,1){22}}
\put(1208,0){\line(0,1){56}}
\put(1227,0){\line(0,1){11}}
\put(1247,0){\line(0,1){33}}
\put(1266,0){\line(0,1){11}}
\put(1286,0){\line(0,1){33}}
\put(1305,0){\line(0,1){11}}
\put(1325,0){\line(0,1){33}}
\put(1344,0){\line(0,1){11}}

```



```

}
\ vbox{\ noindent\ textbf{Region}

{\ smaller
\ begin{tabular}{ rrrr }
n&missing&distinct&value \
344&0&1&Anvers \ end{tabular}
\ begin{verbatim}

Value      Anvers
Frequency   344
Proportion   1
\ end{verbatim}
}
\ smallskip\ hrule\ smallskip
}
\ vbox{\ noindent\ textbf{Island}\ setlength{\ unitlength}{0.001in}\ hfill\ begin{picture}(1.5,.1)(
\ put(0,0){\ line(0,1){100}}
\ put(500,0){\ line(0,1){74}}
\ put(1000,0){\ line(0,1){31}}
\ end{picture}

{\ smaller
\ begin{tabular}{ rrr }
n&missing&distinct \
344&0&3 \ end{tabular}
\ begin{verbatim}

Value      Biscoe      Dream Torgersen
Frequency   168         124         52
Proportion  0.488      0.360      0.151
\ end{verbatim}
}
\ smallskip\ hrule\ smallskip
}
\ vbox{\ noindent\ textbf{Stage}

{\ smaller
\ begin{tabular}{ rrrr }
n&missing&distinct&value \
344&0&1&Adult, 1 Egg Stage \ end{tabular}
\ begin{verbatim}

```

```

Value      Adult, 1 Egg Stage
Frequency      344
Proportion      1
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Individual ID}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
344&0&190 \end{tabular}
\begin{verbatim}

lowest : N100A1 N100A2 N10A1  N10A2  N11A1 , highest: N98A2  N99A1  N99A2  N9A1  N9A2
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Clutch Completion}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
344&0&2 \end{tabular}
\begin{verbatim}

Value      No    Yes
Frequency    36   308
Proportion 0.105 0.895
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Date Egg}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.1
\put(0,0){\line(0,1){43}}
\put(50,0){\line(0,1){7}}
\put(100,0){\line(0,1){50}}
\put(150,0){\line(0,1){14}}
\put(200,0){\line(0,1){64}}
\put(250,0){\line(0,1){14}}

```



```

\put(300,0){\line(0,1){21}}
\put(350,0){\line(0,1){14}}
\put(400,0){\line(0,1){64}}
\put(450,0){\line(0,1){79}}
\put(500,0){\line(0,1){21}}
\put(550,0){\line(0,1){93}}
\put(600,0){\line(0,1){7}}
\put(650,0){\line(0,1){79}}
\put(700,0){\line(0,1){57}}
\put(750,0){\line(0,1){21}}
\put(800,0){\line(0,1){43}}
\put(850,0){\line(0,1){50}}
\put(900,0){\line(0,1){14}}
\put(950,0){\line(0,1){29}}
\put(1000,0){\line(0,1){14}}
\put(1050,0){\line(0,1){29}}
\put(1100,0){\line(0,1){7}}
\put(1150,0){\line(0,1){57}}
\put(1200,0){\line(0,1){36}}
\put(1250,0){\line(0,1){93}}
\put(1300,0){\line(0,1){21}}
\put(1350,0){\line(0,1){100}}
\put(1400,0){\line(0,1){57}}
\put(1450,0){\line(0,1){29}}
\end{picture}

{\smaller
\begin{verbatim}
      n      missing    distinct      Info      Mean      Gmd      .05      .10
      344          0         50      0.999 2008-11-27      328 2007-11-12 2007-11-16
      .25      .50      .75      .90      .95
2007-11-28 2008-11-09 2009-11-16 2009-11-22 2009-11-26

lowest : 2007-11-09 2007-11-10 2007-11-11 2007-11-12 2007-11-13
highest: 2009-11-22 2009-11-23 2009-11-25 2009-11-27 2009-12-01
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Culmen Length (mm)}}\setlength{\unitlength}{0.001in}\hfill\begin{picture}
\put(0,0){\line(0,1){11}}
\put(54,0){\line(0,1){11}}

```

```

\put(75,0){\line(0,1){11}}
\put(108,0){\line(0,1){22}}
\put(129,0){\line(0,1){22}}
\put(140,0){\line(0,1){22}}
\put(161,0){\line(0,1){33}}
\put(172,0){\line(0,1){22}}
\put(183,0){\line(0,1){22}}
\put(194,0){\line(0,1){44}}
\put(204,0){\line(0,1){22}}
\put(215,0){\line(0,1){44}}
\put(226,0){\line(0,1){44}}
\put(237,0){\line(0,1){44}}
\put(248,0){\line(0,1){44}}
\put(258,0){\line(0,1){22}}
\put(269,0){\line(0,1){22}}
\put(280,0){\line(0,1){56}}
\put(291,0){\line(0,1){22}}
\put(301,0){\line(0,1){67}}
\put(312,0){\line(0,1){78}}
\put(323,0){\line(0,1){44}}
\put(334,0){\line(0,1){33}}
\put(344,0){\line(0,1){11}}
\put(355,0){\line(0,1){44}}
\put(366,0){\line(0,1){56}}
\put(377,0){\line(0,1){44}}
\put(387,0){\line(0,1){44}}
\put(398,0){\line(0,1){33}}
\put(409,0){\line(0,1){100}}
\put(420,0){\line(0,1){11}}
\put(430,0){\line(0,1){11}}
\put(441,0){\line(0,1){56}}
\put(452,0){\line(0,1){22}}
\put(463,0){\line(0,1){56}}
\put(473,0){\line(0,1){67}}
\put(484,0){\line(0,1){89}}
\put(495,0){\line(0,1){22}}
\put(506,0){\line(0,1){44}}
\put(517,0){\line(0,1){22}}
\put(527,0){\line(0,1){11}}
\put(538,0){\line(0,1){44}}
\put(549,0){\line(0,1){33}}
\put(560,0){\line(0,1){44}}

```

```

\put(570,0){\line(0,1){33}}
\put(581,0){\line(0,1){44}}
\put(592,0){\line(0,1){11}}
\put(603,0){\line(0,1){67}}
\put(613,0){\line(0,1){44}}
\put(624,0){\line(0,1){11}}
\put(635,0){\line(0,1){11}}
\put(646,0){\line(0,1){33}}
\put(667,0){\line(0,1){44}}
\put(689,0){\line(0,1){22}}
\put(699,0){\line(0,1){44}}
\put(710,0){\line(0,1){89}}
\put(721,0){\line(0,1){78}}
\put(732,0){\line(0,1){56}}
\put(743,0){\line(0,1){44}}
\put(753,0){\line(0,1){56}}
\put(764,0){\line(0,1){67}}
\put(775,0){\line(0,1){100}}
\put(786,0){\line(0,1){44}}
\put(796,0){\line(0,1){67}}
\put(807,0){\line(0,1){11}}
\put(818,0){\line(0,1){44}}
\put(829,0){\line(0,1){56}}
\put(839,0){\line(0,1){33}}
\put(850,0){\line(0,1){11}}
\put(861,0){\line(0,1){22}}
\put(872,0){\line(0,1){22}}
\put(882,0){\line(0,1){67}}
\put(893,0){\line(0,1){44}}
\put(904,0){\line(0,1){11}}
\put(915,0){\line(0,1){67}}
\put(925,0){\line(0,1){44}}
\put(936,0){\line(0,1){44}}
\put(947,0){\line(0,1){44}}
\put(958,0){\line(0,1){44}}
\put(968,0){\line(0,1){78}}
\put(979,0){\line(0,1){44}}
\put(990,0){\line(0,1){78}}
\put(1001,0){\line(0,1){33}}
\put(1012,0){\line(0,1){67}}
\put(1022,0){\line(0,1){33}}
\put(1033,0){\line(0,1){44}}

```

```

\put(1044,0){\line(0,1){33}}
\put(1055,0){\line(0,1){11}}
\put(1065,0){\line(0,1){11}}
\put(1076,0){\line(0,1){44}}
\put(1087,0){\line(0,1){22}}
\put(1098,0){\line(0,1){11}}
\put(1108,0){\line(0,1){11}}
\put(1119,0){\line(0,1){11}}
\put(1151,0){\line(0,1){22}}
\put(1194,0){\line(0,1){22}}
\put(1237,0){\line(0,1){11}}
\put(1281,0){\line(0,1){22}}
\put(1399,0){\line(0,1){11}}
\put(1485,0){\line(0,1){11}}
\end{picture}

{\smaller
\begin{tabular}{l}
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
342&2&164&1&43.92&6.274&35.70&36.60&39.23&44.45&48.50&50.80&51.99 \end{tabular}
\begin{verbatim}

lowest : 32.1 33.1 33.5 34.0 34.1, highest: 55.1 55.8 55.9 58.0 59.6
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Culmen Depth (mm)}\setlength{\unitlength}{0.001in}\hfill\begin{picture}
\put(0,0){\line(0,1){8}}
\put(18,0){\line(0,1){8}}
\put(35,0){\line(0,1){8}}
\put(53,0){\line(0,1){8}}
\put(71,0){\line(0,1){17}}
\put(88,0){\line(0,1){8}}
\put(106,0){\line(0,1){50}}
\put(123,0){\line(0,1){33}}
\put(141,0){\line(0,1){33}}
\put(159,0){\line(0,1){17}}
\put(176,0){\line(0,1){25}}
\put(194,0){\line(0,1){50}}
\put(212,0){\line(0,1){33}}
\put(229,0){\line(0,1){42}}

```

```

\put(247,0){\line(0,1){67}}
\put(265,0){\line(0,1){42}}
\put(282,0){\line(0,1){17}}
\put(300,0){\line(0,1){25}}
\put(317,0){\line(0,1){8}}
\put(335,0){\line(0,1){83}}
\put(353,0){\line(0,1){25}}
\put(370,0){\line(0,1){33}}
\put(388,0){\line(0,1){33}}
\put(406,0){\line(0,1){17}}
\put(423,0){\line(0,1){17}}
\put(441,0){\line(0,1){25}}
\put(458,0){\line(0,1){50}}
\put(476,0){\line(0,1){33}}
\put(494,0){\line(0,1){42}}
\put(511,0){\line(0,1){33}}
\put(529,0){\line(0,1){50}}
\put(547,0){\line(0,1){25}}
\put(564,0){\line(0,1){33}}
\put(582,0){\line(0,1){17}}
\put(600,0){\line(0,1){33}}
\put(617,0){\line(0,1){50}}
\put(635,0){\line(0,1){17}}
\put(652,0){\line(0,1){33}}
\put(670,0){\line(0,1){17}}
\put(688,0){\line(0,1){100}}
\put(705,0){\line(0,1){67}}
\put(723,0){\line(0,1){50}}
\put(741,0){\line(0,1){75}}
\put(758,0){\line(0,1){8}}
\put(776,0){\line(0,1){50}}
\put(794,0){\line(0,1){33}}
\put(811,0){\line(0,1){17}}
\put(829,0){\line(0,1){75}}
\put(846,0){\line(0,1){83}}
\put(864,0){\line(0,1){42}}
\put(882,0){\line(0,1){75}}
\put(899,0){\line(0,1){42}}
\put(917,0){\line(0,1){33}}
\put(935,0){\line(0,1){42}}
\put(952,0){\line(0,1){83}}
\put(970,0){\line(0,1){83}}

```

```
\put(988,0){\line(0,1){50}}
\put(1005,0){\line(0,1){58}}
\put(1023,0){\line(0,1){75}}
\put(1040,0){\line(0,1){75}}
\put(1058,0){\line(0,1){42}}
\put(1076,0){\line(0,1){33}}
\put(1093,0){\line(0,1){17}}
\put(1111,0){\line(0,1){42}}
\put(1129,0){\line(0,1){50}}
\put(1146,0){\line(0,1){25}}
\put(1164,0){\line(0,1){17}}
\put(1181,0){\line(0,1){25}}
\put(1199,0){\line(0,1){25}}
\put(1217,0){\line(0,1){50}}
\put(1234,0){\line(0,1){8}}
\put(1252,0){\line(0,1){8}}
\put(1270,0){\line(0,1){25}}
\put(1305,0){\line(0,1){8}}
\put(1323,0){\line(0,1){8}}
\put(1340,0){\line(0,1){25}}
\put(1358,0){\line(0,1){8}}
\put(1411,0){\line(0,1){25}}
\put(1428,0){\line(0,1){17}}
\put(1481,0){\line(0,1){8}}
\end{picture}

{\smaller
\begin{tabular}{l rrrrrrrrrrrrr }
n&missing&d&i&s&t&i&n&c&t&&I&n&f&o&&M&e&a&n&&G&m&d&&.05&&.10&&.25&&.50&&.75&&.90&&.95 \\\
342&&2&&80&&1&&17.15&&2.267&&13.9&&14.3&&15.6&&17.3&&18.7&&19.5&&20.0 \end{tabular}
\begin{verbatim}

lowest : 13.1 13.2 13.3 13.4 13.5, highest: 20.7 20.8 21.1 21.2 21.5

\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Flipper Length (mm)}\setlength{\unitlength}{0.001in}\hfill\begin{picture}
```

```

\put(175,0){\line(0,1){5}}
\put(200,0){\line(0,1){23}}
\put(225,0){\line(0,1){32}}
\put(250,0){\line(0,1){14}}
\put(275,0){\line(0,1){9}}
\put(300,0){\line(0,1){32}}
\put(324,0){\line(0,1){41}}
\put(349,0){\line(0,1){32}}
\put(374,0){\line(0,1){73}}
\put(399,0){\line(0,1){27}}
\put(424,0){\line(0,1){32}}
\put(449,0){\line(0,1){100}}
\put(474,0){\line(0,1){59}}
\put(499,0){\line(0,1){32}}
\put(524,0){\line(0,1){68}}
\put(549,0){\line(0,1){23}}
\put(574,0){\line(0,1){77}}
\put(599,0){\line(0,1){45}}
\put(624,0){\line(0,1){45}}
\put(649,0){\line(0,1){36}}
\put(674,0){\line(0,1){27}}
\put(699,0){\line(0,1){18}}
\put(724,0){\line(0,1){27}}
\put(749,0){\line(0,1){18}}
\put(774,0){\line(0,1){23}}
\put(824,0){\line(0,1){14}}
\put(849,0){\line(0,1){5}}
\put(874,0){\line(0,1){9}}
\put(899,0){\line(0,1){36}}
\put(924,0){\line(0,1){23}}
\put(949,0){\line(0,1){64}}
\put(973,0){\line(0,1){9}}
\put(998,0){\line(0,1){32}}
\put(1023,0){\line(0,1){27}}
\put(1048,0){\line(0,1){27}}
\put(1073,0){\line(0,1){55}}
\put(1098,0){\line(0,1){36}}
\put(1123,0){\line(0,1){27}}
\put(1148,0){\line(0,1){23}}
\put(1173,0){\line(0,1){23}}
\put(1198,0){\line(0,1){36}}
\put(1223,0){\line(0,1){23}}

```





```

\put(309,0){\line(0,1){67}}
\put(319,0){\line(0,1){25}}
\put(330,0){\line(0,1){58}}
\put(340,0){\line(0,1){17}}
\put(350,0){\line(0,1){75}}
\put(361,0){\line(0,1){8}}
\put(371,0){\line(0,1){58}}
\put(381,0){\line(0,1){8}}
\put(392,0){\line(0,1){50}}
\put(402,0){\line(0,1){17}}
\put(412,0){\line(0,1){92}}
\put(423,0){\line(0,1){25}}
\put(433,0){\line(0,1){42}}
\put(443,0){\line(0,1){33}}
\put(453,0){\line(0,1){100}}
\put(464,0){\line(0,1){8}}
\put(474,0){\line(0,1){8}}
\put(484,0){\line(0,1){8}}
\put(495,0){\line(0,1){83}}
\put(515,0){\line(0,1){83}}
\put(526,0){\line(0,1){8}}
\put(536,0){\line(0,1){42}}
\put(557,0){\line(0,1){50}}
\put(567,0){\line(0,1){8}}
\put(577,0){\line(0,1){42}}
\put(598,0){\line(0,1){50}}
\put(618,0){\line(0,1){42}}
\put(639,0){\line(0,1){42}}
\put(649,0){\line(0,1){8}}
\put(660,0){\line(0,1){67}}
\put(680,0){\line(0,1){17}}
\put(690,0){\line(0,1){8}}
\put(701,0){\line(0,1){67}}
\put(721,0){\line(0,1){42}}
\put(732,0){\line(0,1){8}}
\put(742,0){\line(0,1){25}}
\put(763,0){\line(0,1){17}}
\put(773,0){\line(0,1){8}}
\put(783,0){\line(0,1){42}}
\put(794,0){\line(0,1){17}}
\put(804,0){\line(0,1){42}}
\put(814,0){\line(0,1){8}}

```

```

\put(824,0){\line(0,1){50}}
\put(835,0){\line(0,1){25}}
\put(845,0){\line(0,1){42}}
\put(855,0){\line(0,1){8}}
\put(866,0){\line(0,1){25}}
\put(886,0){\line(0,1){33}}
\put(897,0){\line(0,1){25}}
\put(907,0){\line(0,1){17}}
\put(917,0){\line(0,1){17}}
\put(928,0){\line(0,1){17}}
\put(938,0){\line(0,1){8}}
\put(948,0){\line(0,1){50}}
\put(969,0){\line(0,1){25}}
\put(989,0){\line(0,1){25}}
\put(1010,0){\line(0,1){17}}
\put(1031,0){\line(0,1){33}}
\put(1051,0){\line(0,1){25}}
\put(1072,0){\line(0,1){33}}
\put(1092,0){\line(0,1){25}}
\put(1113,0){\line(0,1){42}}
\put(1134,0){\line(0,1){8}}
\put(1154,0){\line(0,1){42}}
\put(1175,0){\line(0,1){50}}
\put(1195,0){\line(0,1){17}}
\put(1216,0){\line(0,1){25}}
\put(1237,0){\line(0,1){42}}
\put(1257,0){\line(0,1){8}}
\put(1278,0){\line(0,1){17}}
\put(1299,0){\line(0,1){25}}
\put(1340,0){\line(0,1){17}}
\put(1360,0){\line(0,1){17}}
\put(1381,0){\line(0,1){8}}
\put(1484,0){\line(0,1){8}}
\end{picture}

{\smaller
\begin{tabular}{r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
342&2&94&1&4202&911.8&3150&3300&3550&4050&4750&5400&5650 \end{tabular}
\begin{verbatim}

lowest : 2700 2850 2900 2925 2975, highest: 5850 5950 6000 6050 6300

```

```

\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Sex}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
333&11&2 \end{tabular}
\begin{verbatim}

Value      FEMALE    MALE
Frequency    165      168
Proportion  0.495    0.505
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{$\Delta$ 15 N (o/oo)}: \setlength{\unitlength}{0.001in}\hfill\begin{p
\put(0,0){\line(0,1){27}}
\put(25,0){\line(0,1){18}}
\put(37,0){\line(0,1){9}}
\put(75,0){\line(0,1){9}}
\put(87,0){\line(0,1){9}}
\put(100,0){\line(0,1){9}}
\put(112,0){\line(0,1){18}}
\put(125,0){\line(0,1){18}}
\put(150,0){\line(0,1){27}}
\put(162,0){\line(0,1){36}}
\put(175,0){\line(0,1){9}}
\put(200,0){\line(0,1){27}}
\put(212,0){\line(0,1){9}}
\put(225,0){\line(0,1){27}}
\put(237,0){\line(0,1){18}}
\put(250,0){\line(0,1){36}}
\put(275,0){\line(0,1){27}}
\put(287,0){\line(0,1){27}}
\put(300,0){\line(0,1){27}}
\put(312,0){\line(0,1){55}}
\put(325,0){\line(0,1){36}}
\put(337,0){\line(0,1){9}}

```

```

\put(350,0){\line(0,1){64}}
\put(362,0){\line(0,1){18}}
\put(375,0){\line(0,1){73}}
\put(387,0){\line(0,1){27}}
\put(400,0){\line(0,1){55}}
\put(412,0){\line(0,1){64}}
\put(424,0){\line(0,1){27}}
\put(437,0){\line(0,1){18}}
\put(449,0){\line(0,1){73}}
\put(462,0){\line(0,1){36}}
\put(474,0){\line(0,1){36}}
\put(487,0){\line(0,1){36}}
\put(499,0){\line(0,1){18}}
\put(512,0){\line(0,1){45}}
\put(524,0){\line(0,1){100}}
\put(537,0){\line(0,1){36}}
\put(549,0){\line(0,1){27}}
\put(562,0){\line(0,1){9}}
\put(574,0){\line(0,1){45}}
\put(587,0){\line(0,1){45}}
\put(599,0){\line(0,1){36}}
\put(612,0){\line(0,1){36}}
\put(624,0){\line(0,1){73}}
\put(637,0){\line(0,1){55}}
\put(649,0){\line(0,1){27}}
\put(662,0){\line(0,1){9}}
\put(674,0){\line(0,1){27}}
\put(687,0){\line(0,1){27}}
\put(699,0){\line(0,1){18}}
\put(712,0){\line(0,1){27}}
\put(724,0){\line(0,1){45}}
\put(737,0){\line(0,1){9}}
\put(749,0){\line(0,1){27}}
\put(762,0){\line(0,1){45}}
\put(774,0){\line(0,1){27}}
\put(787,0){\line(0,1){36}}
\put(799,0){\line(0,1){18}}
\put(812,0){\line(0,1){55}}
\put(824,0){\line(0,1){36}}
\put(836,0){\line(0,1){36}}
\put(849,0){\line(0,1){9}}
\put(861,0){\line(0,1){36}}

```

```

\put(874,0){\line(0,1){27}}
\put(886,0){\line(0,1){27}}
\put(899,0){\line(0,1){36}}
\put(911,0){\line(0,1){18}}
\put(924,0){\line(0,1){36}}
\put(936,0){\line(0,1){27}}
\put(949,0){\line(0,1){9}}
\put(961,0){\line(0,1){45}}
\put(974,0){\line(0,1){9}}
\put(986,0){\line(0,1){45}}
\put(999,0){\line(0,1){27}}
\put(1011,0){\line(0,1){27}}
\put(1024,0){\line(0,1){27}}
\put(1036,0){\line(0,1){27}}
\put(1049,0){\line(0,1){36}}
\put(1061,0){\line(0,1){9}}
\put(1074,0){\line(0,1){55}}
\put(1086,0){\line(0,1){18}}
\put(1099,0){\line(0,1){9}}
\put(1111,0){\line(0,1){27}}
\put(1124,0){\line(0,1){27}}
\put(1136,0){\line(0,1){55}}
\put(1161,0){\line(0,1){36}}
\put(1174,0){\line(0,1){18}}
\put(1186,0){\line(0,1){9}}
\put(1199,0){\line(0,1){9}}
\put(1224,0){\line(0,1){18}}
\put(1236,0){\line(0,1){18}}
\put(1248,0){\line(0,1){18}}
\put(1261,0){\line(0,1){18}}
\put(1273,0){\line(0,1){18}}
\put(1286,0){\line(0,1){18}}
\put(1298,0){\line(0,1){9}}
\put(1311,0){\line(0,1){18}}
\put(1323,0){\line(0,1){9}}
\put(1336,0){\line(0,1){9}}
\put(1348,0){\line(0,1){27}}
\put(1398,0){\line(0,1){9}}
\put(1436,0){\line(0,1){9}}
\put(1461,0){\line(0,1){9}}
\put(1486,0){\line(0,1){27}}
\end{picture}

```

```

{\smaller
\begin{tabular}{r r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
330&14&330&1&8.733&0.6323&7.897&8.047&8.300&8.652&9.172&9.491&9.689 \end{tabular}
\begin{verbatim}

lowest : 7.63220 7.63452 7.63884 7.68528 7.68870, highest: 9.93727 9.98044 10.02019 10.02019
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{$\Delta$ 13 C (o/oo)}: \setlength{\unitlength}{0.001in}\hfill\begin{p
\put(0,0){\line(0,1){7}}
\put(23,0){\line(0,1){7}}
\put(46,0){\line(0,1){7}}
\put(69,0){\line(0,1){60}}
\put(92,0){\line(0,1){53}}
\put(115,0){\line(0,1){53}}
\put(138,0){\line(0,1){53}}
\put(161,0){\line(0,1){33}}
\put(184,0){\line(0,1){80}}
\put(207,0){\line(0,1){27}}
\put(230,0){\line(0,1){27}}
\put(254,0){\line(0,1){33}}
\put(277,0){\line(0,1){67}}
\put(300,0){\line(0,1){47}}
\put(323,0){\line(0,1){47}}
\put(346,0){\line(0,1){53}}
\put(369,0){\line(0,1){80}}
\put(392,0){\line(0,1){60}}
\put(415,0){\line(0,1){87}}
\put(438,0){\line(0,1){100}}
\put(461,0){\line(0,1){47}}
\put(484,0){\line(0,1){20}}
\put(507,0){\line(0,1){40}}
\put(530,0){\line(0,1){27}}
\put(553,0){\line(0,1){53}}
\put(576,0){\line(0,1){20}}
\put(599,0){\line(0,1){33}}
\put(622,0){\line(0,1){7}}
\put(645,0){\line(0,1){27}}
\put(668,0){\line(0,1){27}}

```

```

\put(691,0){\line(0,1){53}}
\put(714,0){\line(0,1){53}}
\put(738,0){\line(0,1){73}}
\put(761,0){\line(0,1){20}}
\put(784,0){\line(0,1){27}}
\put(807,0){\line(0,1){40}}
\put(830,0){\line(0,1){33}}
\put(853,0){\line(0,1){20}}
\put(876,0){\line(0,1){40}}
\put(899,0){\line(0,1){47}}
\put(922,0){\line(0,1){27}}
\put(945,0){\line(0,1){7}}
\put(968,0){\line(0,1){20}}
\put(991,0){\line(0,1){13}}
\put(1014,0){\line(0,1){20}}
\put(1037,0){\line(0,1){27}}
\put(1060,0){\line(0,1){40}}
\put(1083,0){\line(0,1){53}}
\put(1106,0){\line(0,1){53}}
\put(1129,0){\line(0,1){47}}
\put(1152,0){\line(0,1){20}}
\put(1175,0){\line(0,1){33}}
\put(1198,0){\line(0,1){40}}
\put(1221,0){\line(0,1){33}}
\put(1245,0){\line(0,1){27}}
\put(1268,0){\line(0,1){20}}
\put(1314,0){\line(0,1){13}}
\put(1337,0){\line(0,1){7}}
\put(1429,0){\line(0,1){13}}
\put(1475,0){\line(0,1){7}}
\end{picture}

{\smaller[2]
\begin{tabular}{ rrrrrrrrrrrr }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
331&13&331&1&-25.69&0.9093&-26.79&-26.69&-26.32&-25.83&-25.06&-24.53&-24.36 \end{tabular}
\begin{verbatim}

lowest : -27.01854 -26.95470 -26.89644 -26.86485 -26.86352
highest: -24.16566 -24.10255 -23.90309 -23.89017 -23.78767
\end{verbatim}
}

```

```

\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Comments}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.1)
\put(0,0){\line(0,1){3}}
\put(150,0){\line(0,1){3}}
\put(300,0){\line(0,1){100}}
\put(450,0){\line(0,1){3}}
\put(600,0){\line(0,1){6}}
\put(750,0){\line(0,1){6}}
\put(900,0){\line(0,1){3}}
\put(1050,0){\line(0,1){21}}
\put(1200,0){\line(0,1){12}}
\put(1350,0){\line(0,1){3}}
\end{picture}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
54&290&10 \end{tabular}
\begin{verbatim}

lowest : Adult not sampled.
highest: No blood sample obtained.
\end{verbatim}
}
\smallskip\hrule\smallskip
}
}\end{spacing}

```

Adult not samp  
No delta15N da

## Table 1

```
library(table1)
```

Warning: 'table1' R 4.2.3

'table1'



```
'package:Hmisc':

label, label<-, units

'package:base':

units, units<-
```

```
table1(~ bill_length_mm + bill_depth_mm + flipper_length_mm + body_mass_g | species, data = penguins)
```

Get nicer `table1` LaTeX output by simply installing the `kableExtra` package

	Adelie	Chinstrap	Gentoo	Overall
	(N=152)	(N=68)	(N=124)	(N=344)
bill_length_mm				
Mean (SD)	38.8 (2.66)	48.8 (3.34)	47.5 (3.08)	43.9 (5.46)
Median [Min, Max]	38.8 [32.1, 46.0]	49.6 [40.9, 58.0]	47.3 [40.9, 59.6]	44.5 [32.1, 59.6]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)
bill_depth_mm				
Mean (SD)	18.3 (1.22)	18.4 (1.14)	15.0 (0.981)	17.2 (1.97)
Median [Min, Max]	18.4 [15.5, 21.5]	18.5 [16.4, 20.8]	15.0 [13.1, 17.3]	17.3 [13.1, 21.5]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)
flipper_length_mm				
Mean (SD)	190 (6.54)	196 (7.13)	217 (6.48)	201 (14.1)
Median [Min, Max]	190 [172, 210]	196 [178, 212]	216 [203, 231]	197 [172, 231]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)
body_mass_g				
Mean (SD)	3700 (459)	3730 (384)	5080 (504)	4200 (802)
Median [Min, Max]	3700 [2850, 4780]	3700 [2700, 4800]	5000 [3950, 6300]	4050 [2700, 6300]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)

```
penguins_raw$Species <- sub(" \\(.*\\)", "", penguins_raw$Species)
table1(~ `Culmen Length (mm)` + `Culmen Depth (mm)` + `Flipper Length (mm)` + `Body Mass (g)`
      | Island + Sex | Species,
      data = penguins_raw)
```

Get nicer `table1` LaTeX output by simply installing the `kableExtra` package

	Adelie Penguin	Chinstrap penguin	Gentoo penguin	Overall
	(N=152)	(N=68)	(N=124)	(N=344)
Culmen Length (mm)				
Mean (SD)	38.8 (2.66)	48.8 (3.34)	47.5 (3.08)	43.9 (5.46)
Median [Min, Max]	38.8 [32.1, 46.0]	49.6 [40.9, 58.0]	47.3 [40.9, 59.6]	44.5 [32.1, 59.6]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)
Culmen Depth (mm)				
Mean (SD)	18.3 (1.22)	18.4 (1.14)	15.0 (0.981)	17.2 (1.97)
Median [Min, Max]	18.4 [15.5, 21.5]	18.5 [16.4, 20.8]	15.0 [13.1, 17.3]	17.3 [13.1, 21.5]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)
Flipper Length (mm)				
Mean (SD)	190 (6.54)	196 (7.13)	217 (6.48)	201 (14.1)
Median [Min, Max]	190 [172, 210]	196 [178, 212]	216 [203, 231]	197 [172, 231]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)
Body Mass (g)				
Mean (SD)	3700 (459)	3730 (384)	5080 (504)	4200 (802)
Median [Min, Max]	3700 [2850, 4780]	3700 [2700, 4800]	5000 [3950, 6300]	4050 [2700, 6300]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)
Island				
Biscoe	44 (28.9%)	0 (0%)	124 (100%)	168 (48.8%)
Dream	56 (36.8%)	68 (100%)	0 (0%)	124 (36.0%)
Torgersen	52 (34.2%)	0 (0%)	0 (0%)	52 (15.1%)
Sex				
FEMALE	73 (48.0%)	34 (50.0%)	58 (46.8%)	165 (48.0%)
MALE	73 (48.0%)	34 (50.0%)	61 (49.2%)	168 (48.8%)
Missing	6 (3.9%)	0 (0%)	5 (4.0%)	11 (3.2%)

## Missing Values

```
library(Hmisc)
library(DataExplorer)
```

Warning: 'DataExplorer' R 4.2.3

```
latex(describe(penguins), file = "", caption.placement = "top")
```

```
\begin{spacing}{0.7}
\begin{center}\textbf{ penguins \ 8 Variables~~~~~ 344 ~Observations}\end{center}
\smallskip\hrule\smallskip{\small
\vbox{\noindent\textbf{species}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.1)
\put(0,0){\line(0,1){100}}
\put(500,0){\line(0,1){45}}
\put(1000,0){\line(0,1){82}}
\end{picture}

{\smaller
\begin{tabular}{ rrr }
n&missing&distinct \
344&0&3 \end{tabular}
\begin{verbatim}

Value          Adelie Chinstrap      Gentoo
Frequency      152          68        124
Proportion     0.442       0.198      0.360
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{island}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.1)
\put(0,0){\line(0,1){100}}
\put(500,0){\line(0,1){74}}
\put(1000,0){\line(0,1){31}}
\end{picture}

{\smaller
\begin{tabular}{ rrr }
n&missing&distinct \
```

```

344&0&3 \end{tabular}
\begin{verbatim}

Value          Biscoe      Dream Torgersen
Frequency       168        124         52
Proportion      0.488      0.360       0.151
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{bill\_length\_mm}\setlength{\unitlength}{0.001in}\hfill\begin{picture}
\put(0,0){\line(0,1){11}}
\put(54,0){\line(0,1){11}}
\put(75,0){\line(0,1){11}}
\put(108,0){\line(0,1){22}}
\put(129,0){\line(0,1){22}}
\put(140,0){\line(0,1){22}}
\put(161,0){\line(0,1){33}}
\put(172,0){\line(0,1){22}}
\put(183,0){\line(0,1){22}}
\put(194,0){\line(0,1){44}}
\put(204,0){\line(0,1){22}}
\put(215,0){\line(0,1){44}}
\put(226,0){\line(0,1){44}}
\put(237,0){\line(0,1){44}}
\put(248,0){\line(0,1){44}}
\put(258,0){\line(0,1){22}}
\put(269,0){\line(0,1){22}}
\put(280,0){\line(0,1){56}}
\put(291,0){\line(0,1){22}}
\put(301,0){\line(0,1){67}}
\put(312,0){\line(0,1){78}}
\put(323,0){\line(0,1){44}}
\put(334,0){\line(0,1){33}}
\put(344,0){\line(0,1){11}}
\put(355,0){\line(0,1){44}}
\put(366,0){\line(0,1){56}}
\put(377,0){\line(0,1){44}}
\put(387,0){\line(0,1){44}}
\put(398,0){\line(0,1){33}}
\put(409,0){\line(0,1){100}}
\put(420,0){\line(0,1){11}}

```

```

\put(430,0){\line(0,1){11}}
\put(441,0){\line(0,1){56}}
\put(452,0){\line(0,1){22}}
\put(463,0){\line(0,1){56}}
\put(473,0){\line(0,1){67}}
\put(484,0){\line(0,1){89}}
\put(495,0){\line(0,1){22}}
\put(506,0){\line(0,1){44}}
\put(517,0){\line(0,1){22}}
\put(527,0){\line(0,1){11}}
\put(538,0){\line(0,1){44}}
\put(549,0){\line(0,1){33}}
\put(560,0){\line(0,1){44}}
\put(570,0){\line(0,1){33}}
\put(581,0){\line(0,1){44}}
\put(592,0){\line(0,1){11}}
\put(603,0){\line(0,1){67}}
\put(613,0){\line(0,1){44}}
\put(624,0){\line(0,1){11}}
\put(635,0){\line(0,1){11}}
\put(646,0){\line(0,1){33}}
\put(667,0){\line(0,1){44}}
\put(689,0){\line(0,1){22}}
\put(699,0){\line(0,1){44}}
\put(710,0){\line(0,1){89}}
\put(721,0){\line(0,1){78}}
\put(732,0){\line(0,1){56}}
\put(743,0){\line(0,1){44}}
\put(753,0){\line(0,1){56}}
\put(764,0){\line(0,1){67}}
\put(775,0){\line(0,1){100}}
\put(786,0){\line(0,1){44}}
\put(796,0){\line(0,1){67}}
\put(807,0){\line(0,1){11}}
\put(818,0){\line(0,1){44}}
\put(829,0){\line(0,1){56}}
\put(839,0){\line(0,1){33}}
\put(850,0){\line(0,1){11}}
\put(861,0){\line(0,1){22}}
\put(872,0){\line(0,1){22}}
\put(882,0){\line(0,1){67}}
\put(893,0){\line(0,1){44}}

```

```

\put(904,0){\line(0,1){11}}
\put(915,0){\line(0,1){67}}
\put(925,0){\line(0,1){44}}
\put(936,0){\line(0,1){44}}
\put(947,0){\line(0,1){44}}
\put(958,0){\line(0,1){44}}
\put(968,0){\line(0,1){78}}
\put(979,0){\line(0,1){44}}
\put(990,0){\line(0,1){78}}
\put(1001,0){\line(0,1){33}}
\put(1012,0){\line(0,1){67}}
\put(1022,0){\line(0,1){33}}
\put(1033,0){\line(0,1){44}}
\put(1044,0){\line(0,1){33}}
\put(1055,0){\line(0,1){11}}
\put(1065,0){\line(0,1){11}}
\put(1076,0){\line(0,1){44}}
\put(1087,0){\line(0,1){22}}
\put(1098,0){\line(0,1){11}}
\put(1108,0){\line(0,1){11}}
\put(1119,0){\line(0,1){11}}
\put(1151,0){\line(0,1){22}}
\put(1194,0){\line(0,1){22}}
\put(1237,0){\line(0,1){11}}
\put(1281,0){\line(0,1){22}}
\put(1399,0){\line(0,1){11}}
\put(1485,0){\line(0,1){11}}
\end{picture}

{\smaller
\begin{tabular}{r r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
342&2&164&1&43.92&6.274&35.70&36.60&39.23&44.45&48.50&50.80&51.99 \end{tabular}}
\begin{verbatim}

lowest : 32.1 33.1 33.5 34.0 34.1, highest: 55.1 55.8 55.9 58.0 59.6
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{bill\_depth\_mm}\setlength{\unitlength}{0.001in}\hfill\begin{picture}
\put(0,0){\line(0,1){8}}

```

```

\put(18,0){\line(0,1){8}}
\put(35,0){\line(0,1){8}}
\put(53,0){\line(0,1){8}}
\put(71,0){\line(0,1){17}}
\put(88,0){\line(0,1){8}}
\put(106,0){\line(0,1){50}}
\put(123,0){\line(0,1){33}}
\put(141,0){\line(0,1){33}}
\put(159,0){\line(0,1){17}}
\put(176,0){\line(0,1){25}}
\put(194,0){\line(0,1){50}}
\put(212,0){\line(0,1){33}}
\put(229,0){\line(0,1){42}}
\put(247,0){\line(0,1){67}}
\put(265,0){\line(0,1){42}}
\put(282,0){\line(0,1){17}}
\put(300,0){\line(0,1){25}}
\put(317,0){\line(0,1){8}}
\put(335,0){\line(0,1){83}}
\put(353,0){\line(0,1){25}}
\put(370,0){\line(0,1){33}}
\put(388,0){\line(0,1){33}}
\put(406,0){\line(0,1){17}}
\put(423,0){\line(0,1){17}}
\put(441,0){\line(0,1){25}}
\put(458,0){\line(0,1){50}}
\put(476,0){\line(0,1){33}}
\put(494,0){\line(0,1){42}}
\put(511,0){\line(0,1){33}}
\put(529,0){\line(0,1){50}}
\put(547,0){\line(0,1){25}}
\put(564,0){\line(0,1){33}}
\put(582,0){\line(0,1){17}}
\put(600,0){\line(0,1){33}}
\put(617,0){\line(0,1){50}}
\put(635,0){\line(0,1){17}}
\put(652,0){\line(0,1){33}}
\put(670,0){\line(0,1){17}}
\put(688,0){\line(0,1){100}}
\put(705,0){\line(0,1){67}}
\put(723,0){\line(0,1){50}}
\put(741,0){\line(0,1){75}}

```

```

\put(758,0){\line(0,1){8}}
\put(776,0){\line(0,1){50}}
\put(794,0){\line(0,1){33}}
\put(811,0){\line(0,1){17}}
\put(829,0){\line(0,1){75}}
\put(846,0){\line(0,1){83}}
\put(864,0){\line(0,1){42}}
\put(882,0){\line(0,1){75}}
\put(899,0){\line(0,1){42}}
\put(917,0){\line(0,1){33}}
\put(935,0){\line(0,1){42}}
\put(952,0){\line(0,1){83}}
\put(970,0){\line(0,1){83}}
\put(988,0){\line(0,1){50}}
\put(1005,0){\line(0,1){58}}
\put(1023,0){\line(0,1){75}}
\put(1040,0){\line(0,1){75}}
\put(1058,0){\line(0,1){42}}
\put(1076,0){\line(0,1){33}}
\put(1093,0){\line(0,1){17}}
\put(1111,0){\line(0,1){42}}
\put(1129,0){\line(0,1){50}}
\put(1146,0){\line(0,1){25}}
\put(1164,0){\line(0,1){17}}
\put(1181,0){\line(0,1){25}}
\put(1199,0){\line(0,1){25}}
\put(1217,0){\line(0,1){50}}
\put(1234,0){\line(0,1){8}}
\put(1252,0){\line(0,1){8}}
\put(1270,0){\line(0,1){25}}
\put(1305,0){\line(0,1){8}}
\put(1323,0){\line(0,1){8}}
\put(1340,0){\line(0,1){25}}
\put(1358,0){\line(0,1){8}}
\put(1411,0){\line(0,1){25}}
\put(1428,0){\line(0,1){17}}
\put(1481,0){\line(0,1){8}}
\end{picture}

{\smaller
\begin{tabular}{ rrrrrrrrrrrr }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\

```



```

342&2&80&1&17.15&2.267&13.9&14.3&15.6&17.3&18.7&19.5&20.0 \end{tabular}
\begin{verbatim}

lowest : 13.1 13.2 13.3 13.4 13.5, highest: 20.7 20.8 21.1 21.2 21.5
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{flipper\_\length\_\mm}\setlength{\unitlength}{0.001in}\hfill\begin{pict
\put(0,0){\line(0,1){5}}
\put(50,0){\line(0,1){5}}
\put(100,0){\line(0,1){5}}
\put(150,0){\line(0,1){18}}
\put(175,0){\line(0,1){5}}
\put(200,0){\line(0,1){23}}
\put(225,0){\line(0,1){32}}
\put(250,0){\line(0,1){14}}
\put(275,0){\line(0,1){9}}
\put(300,0){\line(0,1){32}}
\put(324,0){\line(0,1){41}}
\put(349,0){\line(0,1){32}}
\put(374,0){\line(0,1){73}}
\put(399,0){\line(0,1){27}}
\put(424,0){\line(0,1){32}}
\put(449,0){\line(0,1){100}}
\put(474,0){\line(0,1){59}}
\put(499,0){\line(0,1){32}}
\put(524,0){\line(0,1){68}}
\put(549,0){\line(0,1){23}}
\put(574,0){\line(0,1){77}}
\put(599,0){\line(0,1){45}}
\put(624,0){\line(0,1){45}}
\put(649,0){\line(0,1){36}}
\put(674,0){\line(0,1){27}}
\put(699,0){\line(0,1){18}}
\put(724,0){\line(0,1){27}}
\put(749,0){\line(0,1){18}}
\put(774,0){\line(0,1){23}}
\put(824,0){\line(0,1){14}}
\put(849,0){\line(0,1){5}}
\put(874,0){\line(0,1){9}}
\put(899,0){\line(0,1){36}}

```

```

\put(924,0){\line(0,1){23}}
\put(949,0){\line(0,1){64}}
\put(973,0){\line(0,1){9}}
\put(998,0){\line(0,1){32}}
\put(1023,0){\line(0,1){27}}
\put(1048,0){\line(0,1){27}}
\put(1073,0){\line(0,1){55}}
\put(1098,0){\line(0,1){36}}
\put(1123,0){\line(0,1){27}}
\put(1148,0){\line(0,1){23}}
\put(1173,0){\line(0,1){23}}
\put(1198,0){\line(0,1){36}}
\put(1223,0){\line(0,1){23}}
\put(1248,0){\line(0,1){27}}
\put(1273,0){\line(0,1){9}}
\put(1298,0){\line(0,1){14}}
\put(1323,0){\line(0,1){18}}
\put(1348,0){\line(0,1){5}}
\put(1398,0){\line(0,1){18}}
\put(1423,0){\line(0,1){9}}
\put(1448,0){\line(0,1){32}}
\put(1473,0){\line(0,1){5}}
\end{picture}

{\smaller
\begin{tabular}{r r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
342&2&55&0.999&200.9&16.03&181.0&185.0&190.0&197.0&213.0&220.9&225.0 \end{tabular}
\begin{verbatim}

lowest : 172 174 176 178 179, highest: 226 228 229 230 231
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{body\_mass\_g}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1
\put(0,0){\line(0,1){8}}
\put(62,0){\line(0,1){17}}
\put(82,0){\line(0,1){33}}
\put(93,0){\line(0,1){8}}
\put(113,0){\line(0,1){8}}
\put(124,0){\line(0,1){17}}

```

```

\put(144,0){\line(0,1){33}}
\put(155,0){\line(0,1){8}}
\put(165,0){\line(0,1){8}}
\put(186,0){\line(0,1){33}}
\put(196,0){\line(0,1){17}}
\put(206,0){\line(0,1){42}}
\put(227,0){\line(0,1){42}}
\put(237,0){\line(0,1){8}}
\put(247,0){\line(0,1){50}}
\put(258,0){\line(0,1){42}}
\put(268,0){\line(0,1){42}}
\put(289,0){\line(0,1){67}}
\put(299,0){\line(0,1){17}}
\put(309,0){\line(0,1){67}}
\put(319,0){\line(0,1){25}}
\put(330,0){\line(0,1){58}}
\put(340,0){\line(0,1){17}}
\put(350,0){\line(0,1){75}}
\put(361,0){\line(0,1){8}}
\put(371,0){\line(0,1){58}}
\put(381,0){\line(0,1){8}}
\put(392,0){\line(0,1){50}}
\put(402,0){\line(0,1){17}}
\put(412,0){\line(0,1){92}}
\put(423,0){\line(0,1){25}}
\put(433,0){\line(0,1){42}}
\put(443,0){\line(0,1){33}}
\put(453,0){\line(0,1){100}}
\put(464,0){\line(0,1){8}}
\put(474,0){\line(0,1){8}}
\put(484,0){\line(0,1){8}}
\put(495,0){\line(0,1){83}}
\put(515,0){\line(0,1){83}}
\put(526,0){\line(0,1){8}}
\put(536,0){\line(0,1){42}}
\put(557,0){\line(0,1){50}}
\put(567,0){\line(0,1){8}}
\put(577,0){\line(0,1){42}}
\put(598,0){\line(0,1){50}}
\put(618,0){\line(0,1){42}}
\put(639,0){\line(0,1){42}}
\put(649,0){\line(0,1){8}}

```

```

\put(660,0){\line(0,1){67}}
\put(680,0){\line(0,1){17}}
\put(690,0){\line(0,1){8}}
\put(701,0){\line(0,1){67}}
\put(721,0){\line(0,1){42}}
\put(732,0){\line(0,1){8}}
\put(742,0){\line(0,1){25}}
\put(763,0){\line(0,1){17}}
\put(773,0){\line(0,1){8}}
\put(783,0){\line(0,1){42}}
\put(794,0){\line(0,1){17}}
\put(804,0){\line(0,1){42}}
\put(814,0){\line(0,1){8}}
\put(824,0){\line(0,1){50}}
\put(835,0){\line(0,1){25}}
\put(845,0){\line(0,1){42}}
\put(855,0){\line(0,1){8}}
\put(866,0){\line(0,1){25}}
\put(886,0){\line(0,1){33}}
\put(897,0){\line(0,1){25}}
\put(907,0){\line(0,1){17}}
\put(917,0){\line(0,1){17}}
\put(928,0){\line(0,1){17}}
\put(938,0){\line(0,1){8}}
\put(948,0){\line(0,1){50}}
\put(969,0){\line(0,1){25}}
\put(989,0){\line(0,1){25}}
\put(1010,0){\line(0,1){17}}
\put(1031,0){\line(0,1){33}}
\put(1051,0){\line(0,1){25}}
\put(1072,0){\line(0,1){33}}
\put(1092,0){\line(0,1){25}}
\put(1113,0){\line(0,1){42}}
\put(1134,0){\line(0,1){8}}
\put(1154,0){\line(0,1){42}}
\put(1175,0){\line(0,1){50}}
\put(1195,0){\line(0,1){17}}
\put(1216,0){\line(0,1){25}}
\put(1237,0){\line(0,1){42}}
\put(1257,0){\line(0,1){8}}
\put(1278,0){\line(0,1){17}}
\put(1299,0){\line(0,1){25}}

```

```

\put(1340,0){\line(0,1){17}}
\put(1360,0){\line(0,1){17}}
\put(1381,0){\line(0,1){8}}
\put(1484,0){\line(0,1){8}}
\end{picture}

{\smaller
\begin{tabular}{r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
342&2&94&1&4202&911.8&3150&3300&3550&4050&4750&5400&5650 \end{tabular}
\begin{verbatim}

lowest : 2700 2850 2900 2925 2975, highest: 5850 5950 6000 6050 6300
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{sex}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
333&11&2 \end{tabular}
\begin{verbatim}

Value      female    male
Frequency   165      168
Proportion  0.495    0.505
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{year}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.1)(1500,0)
\put(0,0){\line(0,1){92}}
\put(500,0){\line(0,1){95}}
\put(1000,0){\line(0,1){100}}
\end{picture}

{\smaller
\begin{tabular}{r r r r r r }
n&missing&distinct&Info&Mean&Gmd \\\
344&0&3&0.888&2008&0.8919 \end{tabular}

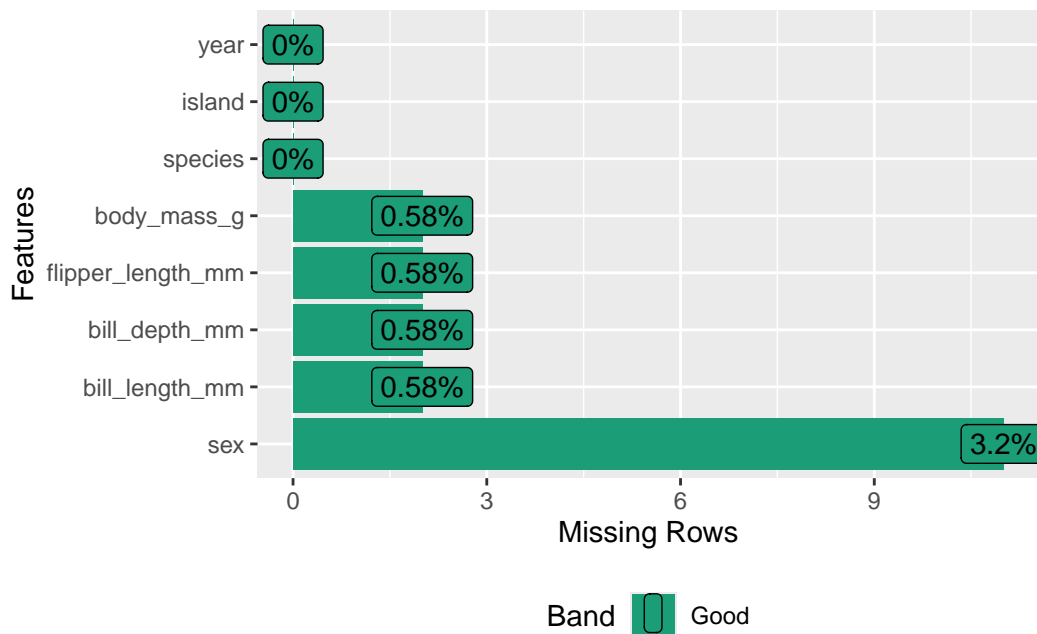
```

```

\begin{verbatim}
Value      2007  2008  2009
Frequency   110   114   120
Proportion 0.320 0.331 0.349
\end{verbatim}
}
\smallskip\hrule\smallskip
}
}\end{spacing}

```

```
plot_missing(penguins)
```



```
latex(describe(penguins_raw), file = "", caption.placement = "top")
```

```

\begin{spacing}{0.7}
\begin{center}\textbf{ penguins\_raw \ 17 Variables~~~~~ 344 ~Observations}\end{center}
\smallskip\hrule\smallskip{\small
\vbox{\noindent\textbf{studyName}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.
\put(0,0){\line(0,1){92}}
\put(500,0){\line(0,1){95}}

```

```

\put(1000,0){\line(0,1){100}}
\end{picture}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
344&0&3 \end{tabular}
\begin{verbatim}

Value      PAL0708 PAL0809 PAL0910
Frequency   110     114     120
Proportion  0.320   0.331   0.349
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Sample Number}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1
\put(0,0){\line(0,1){33}}
\put(19,0){\line(0,1){33}}
\put(39,0){\line(0,1){100}}
\put(58,0){\line(0,1){33}}
\put(78,0){\line(0,1){100}}
\put(97,0){\line(0,1){33}}
\put(117,0){\line(0,1){100}}
\put(136,0){\line(0,1){33}}
\put(156,0){\line(0,1){100}}
\put(175,0){\line(0,1){33}}
\put(195,0){\line(0,1){100}}
\put(214,0){\line(0,1){33}}
\put(234,0){\line(0,1){100}}
\put(253,0){\line(0,1){33}}
\put(273,0){\line(0,1){100}}
\put(292,0){\line(0,1){33}}
\put(312,0){\line(0,1){100}}
\put(331,0){\line(0,1){33}}
\put(351,0){\line(0,1){100}}
\put(370,0){\line(0,1){33}}
\put(390,0){\line(0,1){100}}
\put(409,0){\line(0,1){33}}
\put(429,0){\line(0,1){100}}
\put(448,0){\line(0,1){33}}
\put(468,0){\line(0,1){100}}

```

```

\put(487,0){\line(0,1){33}}
\put(506,0){\line(0,1){100}}
\put(526,0){\line(0,1){33}}
\put(545,0){\line(0,1){100}}
\put(565,0){\line(0,1){33}}
\put(584,0){\line(0,1){100}}
\put(604,0){\line(0,1){33}}
\put(623,0){\line(0,1){100}}
\put(643,0){\line(0,1){33}}
\put(662,0){\line(0,1){89}}
\put(682,0){\line(0,1){22}}
\put(701,0){\line(0,1){67}}
\put(721,0){\line(0,1){22}}
\put(740,0){\line(0,1){67}}
\put(760,0){\line(0,1){22}}
\put(779,0){\line(0,1){67}}
\put(799,0){\line(0,1){22}}
\put(818,0){\line(0,1){67}}
\put(838,0){\line(0,1){22}}
\put(857,0){\line(0,1){67}}
\put(877,0){\line(0,1){22}}
\put(896,0){\line(0,1){67}}
\put(916,0){\line(0,1){22}}
\put(935,0){\line(0,1){67}}
\put(955,0){\line(0,1){22}}
\put(974,0){\line(0,1){67}}
\put(994,0){\line(0,1){22}}
\put(1013,0){\line(0,1){67}}
\put(1032,0){\line(0,1){22}}
\put(1052,0){\line(0,1){67}}
\put(1071,0){\line(0,1){22}}
\put(1091,0){\line(0,1){67}}
\put(1110,0){\line(0,1){22}}
\put(1130,0){\line(0,1){67}}
\put(1149,0){\line(0,1){22}}
\put(1169,0){\line(0,1){67}}
\put(1188,0){\line(0,1){22}}
\put(1208,0){\line(0,1){56}}
\put(1227,0){\line(0,1){11}}
\put(1247,0){\line(0,1){33}}
\put(1266,0){\line(0,1){11}}
\put(1286,0){\line(0,1){33}}

```



```

\put(1305,0){\line(0,1){11}}
\put(1325,0){\line(0,1){33}}
\put(1344,0){\line(0,1){11}}
\put(1364,0){\line(0,1){33}}
\put(1383,0){\line(0,1){11}}
\put(1403,0){\line(0,1){33}}
\put(1422,0){\line(0,1){11}}
\put(1442,0){\line(0,1){33}}
\put(1461,0){\line(0,1){11}}
\put(1481,0){\line(0,1){22}}
\end{picture}

{\smaller[2]
\begin{tabular}{r r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
344&0&152&1&63.15&46.35& 6.15& 12.00& 29.00& 58.00& 95.25&121.00&134.85 \end{tabular}
\begin{verbatim}

lowest :    1    2    3    4    5, highest: 148 149 150 151 152
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Species}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.1)
\put(0,0){\line(0,1){100}}
\put(500,0){\line(0,1){45}}
\put(1000,0){\line(0,1){82}}
\end{picture}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
344&0&3 \end{tabular}
\begin{verbatim}

Value          Adelie Penguin Chinstrap penguin      Gentoo penguin
Frequency              152                68              124
Proportion          0.442                0.198              0.360
\end{verbatim}
}
\smallskip\hrule\smallskip
}

```

```

\ vbox{\ noindent\ textbf{Region}

{\ smaller
\ begin{tabular}{ rrrr }
n&missing&distinct&value \
344&0&1&Anvers \ end{tabular}
\ begin{verbatim}

Value      Anvers
Frequency   344
Proportion   1
\ end{verbatim}
}
\ smallskip\ hrule\ smallskip
}
\ vbox{\ noindent\ textbf{Island}\ setlength{\ unitlength}{0.001in}\ hfill\ begin{picture}(1.5,.1)(
\ put(0,0){\ line(0,1){100}}
\ put(500,0){\ line(0,1){74}}
\ put(1000,0){\ line(0,1){31}}
\ end{picture}

{\ smaller
\ begin{tabular}{ rrr }
n&missing&distinct \
344&0&3 \ end{tabular}
\ begin{verbatim}

Value      Biscoe      Dream Torgersen
Frequency   168        124        52
Proportion  0.488      0.360      0.151
\ end{verbatim}
}
\ smallskip\ hrule\ smallskip
}
\ vbox{\ noindent\ textbf{Stage}

{\ smaller
\ begin{tabular}{ rrrr }
n&missing&distinct&value \
344&0&1&Adult, 1 Egg Stage \ end{tabular}
\ begin{verbatim}

```

```

Value      Adult, 1 Egg Stage
Frequency      344
Proportion      1
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Individual ID}}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\
344&0&190 \end{tabular}
\begin{verbatim}

lowest : N100A1 N100A2 N10A1  N10A2  N11A1 , highest: N98A2  N99A1  N99A2  N9A1  N9A2
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Clutch Completion}}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\
344&0&2 \end{tabular}
\begin{verbatim}

Value      No   Yes
Frequency    36   308
Proportion 0.105 0.895
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Date Egg}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.1
\put(0,0){\line(0,1){43}}
\put(50,0){\line(0,1){7}}
\put(100,0){\line(0,1){50}}
\put(150,0){\line(0,1){14}}
\put(200,0){\line(0,1){64}}
\put(250,0){\line(0,1){14}}

```

```

\put(300,0){\line(0,1){21}}
\put(350,0){\line(0,1){14}}
\put(400,0){\line(0,1){64}}
\put(450,0){\line(0,1){79}}
\put(500,0){\line(0,1){21}}
\put(550,0){\line(0,1){93}}
\put(600,0){\line(0,1){7}}
\put(650,0){\line(0,1){79}}
\put(700,0){\line(0,1){57}}
\put(750,0){\line(0,1){21}}
\put(800,0){\line(0,1){43}}
\put(850,0){\line(0,1){50}}
\put(900,0){\line(0,1){14}}
\put(950,0){\line(0,1){29}}
\put(1000,0){\line(0,1){14}}
\put(1050,0){\line(0,1){29}}
\put(1100,0){\line(0,1){7}}
\put(1150,0){\line(0,1){57}}
\put(1200,0){\line(0,1){36}}
\put(1250,0){\line(0,1){93}}
\put(1300,0){\line(0,1){21}}
\put(1350,0){\line(0,1){100}}
\put(1400,0){\line(0,1){57}}
\put(1450,0){\line(0,1){29}}
\end{picture}

{\smaller
\begin{verbatim}
      n      missing    distinct      Info      Mean      Gmd      .05      .10
    344         0         50    0.999 2008-11-27    328 2007-11-12 2007-11-16
    .25      .50      .75      .90      .95
2007-11-28 2008-11-09 2009-11-16 2009-11-22 2009-11-26

lowest : 2007-11-09 2007-11-10 2007-11-11 2007-11-12 2007-11-13
highest: 2009-11-22 2009-11-23 2009-11-25 2009-11-27 2009-12-01
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Culmen Length (mm)}}\setlength{\unitlength}{0.001in}\hfill\begin{picture}
\put(0,0){\line(0,1){11}}
\put(54,0){\line(0,1){11}}

```

```

\put(75,0){\line(0,1){11}}
\put(108,0){\line(0,1){22}}
\put(129,0){\line(0,1){22}}
\put(140,0){\line(0,1){22}}
\put(161,0){\line(0,1){33}}
\put(172,0){\line(0,1){22}}
\put(183,0){\line(0,1){22}}
\put(194,0){\line(0,1){44}}
\put(204,0){\line(0,1){22}}
\put(215,0){\line(0,1){44}}
\put(226,0){\line(0,1){44}}
\put(237,0){\line(0,1){44}}
\put(248,0){\line(0,1){44}}
\put(258,0){\line(0,1){22}}
\put(269,0){\line(0,1){22}}
\put(280,0){\line(0,1){56}}
\put(291,0){\line(0,1){22}}
\put(301,0){\line(0,1){67}}
\put(312,0){\line(0,1){78}}
\put(323,0){\line(0,1){44}}
\put(334,0){\line(0,1){33}}
\put(344,0){\line(0,1){11}}
\put(355,0){\line(0,1){44}}
\put(366,0){\line(0,1){56}}
\put(377,0){\line(0,1){44}}
\put(387,0){\line(0,1){44}}
\put(398,0){\line(0,1){33}}
\put(409,0){\line(0,1){100}}
\put(420,0){\line(0,1){11}}
\put(430,0){\line(0,1){11}}
\put(441,0){\line(0,1){56}}
\put(452,0){\line(0,1){22}}
\put(463,0){\line(0,1){56}}
\put(473,0){\line(0,1){67}}
\put(484,0){\line(0,1){89}}
\put(495,0){\line(0,1){22}}
\put(506,0){\line(0,1){44}}
\put(517,0){\line(0,1){22}}
\put(527,0){\line(0,1){11}}
\put(538,0){\line(0,1){44}}
\put(549,0){\line(0,1){33}}
\put(560,0){\line(0,1){44}}

```

```

\put(570,0){\line(0,1){33}}
\put(581,0){\line(0,1){44}}
\put(592,0){\line(0,1){11}}
\put(603,0){\line(0,1){67}}
\put(613,0){\line(0,1){44}}
\put(624,0){\line(0,1){11}}
\put(635,0){\line(0,1){11}}
\put(646,0){\line(0,1){33}}
\put(667,0){\line(0,1){44}}
\put(689,0){\line(0,1){22}}
\put(699,0){\line(0,1){44}}
\put(710,0){\line(0,1){89}}
\put(721,0){\line(0,1){78}}
\put(732,0){\line(0,1){56}}
\put(743,0){\line(0,1){44}}
\put(753,0){\line(0,1){56}}
\put(764,0){\line(0,1){67}}
\put(775,0){\line(0,1){100}}
\put(786,0){\line(0,1){44}}
\put(796,0){\line(0,1){67}}
\put(807,0){\line(0,1){11}}
\put(818,0){\line(0,1){44}}
\put(829,0){\line(0,1){56}}
\put(839,0){\line(0,1){33}}
\put(850,0){\line(0,1){11}}
\put(861,0){\line(0,1){22}}
\put(872,0){\line(0,1){22}}
\put(882,0){\line(0,1){67}}
\put(893,0){\line(0,1){44}}
\put(904,0){\line(0,1){11}}
\put(915,0){\line(0,1){67}}
\put(925,0){\line(0,1){44}}
\put(936,0){\line(0,1){44}}
\put(947,0){\line(0,1){44}}
\put(958,0){\line(0,1){44}}
\put(968,0){\line(0,1){78}}
\put(979,0){\line(0,1){44}}
\put(990,0){\line(0,1){78}}
\put(1001,0){\line(0,1){33}}
\put(1012,0){\line(0,1){67}}
\put(1022,0){\line(0,1){33}}
\put(1033,0){\line(0,1){44}}

```

```

\put(1044,0){\line(0,1){33}}
\put(1055,0){\line(0,1){11}}
\put(1065,0){\line(0,1){11}}
\put(1076,0){\line(0,1){44}}
\put(1087,0){\line(0,1){22}}
\put(1098,0){\line(0,1){11}}
\put(1108,0){\line(0,1){11}}
\put(1119,0){\line(0,1){11}}
\put(1151,0){\line(0,1){22}}
\put(1194,0){\line(0,1){22}}
\put(1237,0){\line(0,1){11}}
\put(1281,0){\line(0,1){22}}
\put(1399,0){\line(0,1){11}}
\put(1485,0){\line(0,1){11}}
\end{picture}

{\smaller
\begin{tabular}{r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
342&2&164&1&43.92&6.274&35.70&36.60&39.23&44.45&48.50&50.80&51.99 \end{tabular}
\begin{verbatim}

lowest : 32.1 33.1 33.5 34.0 34.1, highest: 55.1 55.8 55.9 58.0 59.6
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Culmen Depth (mm)}\setlength{\unitlength}{0.001in}\hfill\begin{picture}
\put(0,0){\line(0,1){8}}
\put(18,0){\line(0,1){8}}
\put(35,0){\line(0,1){8}}
\put(53,0){\line(0,1){8}}
\put(71,0){\line(0,1){17}}
\put(88,0){\line(0,1){8}}
\put(106,0){\line(0,1){50}}
\put(123,0){\line(0,1){33}}
\put(141,0){\line(0,1){33}}
\put(159,0){\line(0,1){17}}
\put(176,0){\line(0,1){25}}
\put(194,0){\line(0,1){50}}
\put(212,0){\line(0,1){33}}
\put(229,0){\line(0,1){42}}

```

```

\put(247,0){\line(0,1){67}}
\put(265,0){\line(0,1){42}}
\put(282,0){\line(0,1){17}}
\put(300,0){\line(0,1){25}}
\put(317,0){\line(0,1){8}}
\put(335,0){\line(0,1){83}}
\put(353,0){\line(0,1){25}}
\put(370,0){\line(0,1){33}}
\put(388,0){\line(0,1){33}}
\put(406,0){\line(0,1){17}}
\put(423,0){\line(0,1){17}}
\put(441,0){\line(0,1){25}}
\put(458,0){\line(0,1){50}}
\put(476,0){\line(0,1){33}}
\put(494,0){\line(0,1){42}}
\put(511,0){\line(0,1){33}}
\put(529,0){\line(0,1){50}}
\put(547,0){\line(0,1){25}}
\put(564,0){\line(0,1){33}}
\put(582,0){\line(0,1){17}}
\put(600,0){\line(0,1){33}}
\put(617,0){\line(0,1){50}}
\put(635,0){\line(0,1){17}}
\put(652,0){\line(0,1){33}}
\put(670,0){\line(0,1){17}}
\put(688,0){\line(0,1){100}}
\put(705,0){\line(0,1){67}}
\put(723,0){\line(0,1){50}}
\put(741,0){\line(0,1){75}}
\put(758,0){\line(0,1){8}}
\put(776,0){\line(0,1){50}}
\put(794,0){\line(0,1){33}}
\put(811,0){\line(0,1){17}}
\put(829,0){\line(0,1){75}}
\put(846,0){\line(0,1){83}}
\put(864,0){\line(0,1){42}}
\put(882,0){\line(0,1){75}}
\put(899,0){\line(0,1){42}}
\put(917,0){\line(0,1){33}}
\put(935,0){\line(0,1){42}}
\put(952,0){\line(0,1){83}}
\put(970,0){\line(0,1){83}}

```



```
\put(988,0){\line(0,1){50}}
\put(1005,0){\line(0,1){58}}
\put(1023,0){\line(0,1){75}}
\put(1040,0){\line(0,1){75}}
\put(1058,0){\line(0,1){42}}
\put(1076,0){\line(0,1){33}}
\put(1093,0){\line(0,1){17}}
\put(1111,0){\line(0,1){42}}
\put(1129,0){\line(0,1){50}}
\put(1146,0){\line(0,1){25}}
\put(1164,0){\line(0,1){17}}
\put(1181,0){\line(0,1){25}}
\put(1199,0){\line(0,1){25}}
\put(1217,0){\line(0,1){50}}
\put(1234,0){\line(0,1){8}}
\put(1252,0){\line(0,1){8}}
\put(1270,0){\line(0,1){25}}
\put(1305,0){\line(0,1){8}}
\put(1323,0){\line(0,1){8}}
\put(1340,0){\line(0,1){25}}
\put(1358,0){\line(0,1){8}}
\put(1411,0){\line(0,1){25}}
\put(1428,0){\line(0,1){17}}
\put(1481,0){\line(0,1){8}}
\end{picture}

{\smaller
\begin{tabular}{l rrrrrrrrrrrrr }
n&missing&d&i&s&t&i&n&c&t&&I&n&f&o&&M&e&a&n&&G&m&d&&.05&&.10&&.25&&.50&&.75&&.90&&.95 \\\
342&&2&&80&&1&&17.15&&2.267&&13.9&&14.3&&15.6&&17.3&&18.7&&19.5&&20.0 \end{tabular}
\begin{verbatim}

lowest : 13.1 13.2 13.3 13.4 13.5, highest: 20.7 20.8 21.1 21.2 21.5

\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Flipper Length (mm)}\setlength{\unitlength}{0.001in}\hfill\begin{picture}
```

```

\put(175,0){\line(0,1){5}}
\put(200,0){\line(0,1){23}}
\put(225,0){\line(0,1){32}}
\put(250,0){\line(0,1){14}}
\put(275,0){\line(0,1){9}}
\put(300,0){\line(0,1){32}}
\put(324,0){\line(0,1){41}}
\put(349,0){\line(0,1){32}}
\put(374,0){\line(0,1){73}}
\put(399,0){\line(0,1){27}}
\put(424,0){\line(0,1){32}}
\put(449,0){\line(0,1){100}}
\put(474,0){\line(0,1){59}}
\put(499,0){\line(0,1){32}}
\put(524,0){\line(0,1){68}}
\put(549,0){\line(0,1){23}}
\put(574,0){\line(0,1){77}}
\put(599,0){\line(0,1){45}}
\put(624,0){\line(0,1){45}}
\put(649,0){\line(0,1){36}}
\put(674,0){\line(0,1){27}}
\put(699,0){\line(0,1){18}}
\put(724,0){\line(0,1){27}}
\put(749,0){\line(0,1){18}}
\put(774,0){\line(0,1){23}}
\put(824,0){\line(0,1){14}}
\put(849,0){\line(0,1){5}}
\put(874,0){\line(0,1){9}}
\put(899,0){\line(0,1){36}}
\put(924,0){\line(0,1){23}}
\put(949,0){\line(0,1){64}}
\put(973,0){\line(0,1){9}}
\put(998,0){\line(0,1){32}}
\put(1023,0){\line(0,1){27}}
\put(1048,0){\line(0,1){27}}
\put(1073,0){\line(0,1){55}}
\put(1098,0){\line(0,1){36}}
\put(1123,0){\line(0,1){27}}
\put(1148,0){\line(0,1){23}}
\put(1173,0){\line(0,1){23}}
\put(1198,0){\line(0,1){36}}
\put(1223,0){\line(0,1){23}}

```



```

\put(309,0){\line(0,1){67}}
\put(319,0){\line(0,1){25}}
\put(330,0){\line(0,1){58}}
\put(340,0){\line(0,1){17}}
\put(350,0){\line(0,1){75}}
\put(361,0){\line(0,1){8}}
\put(371,0){\line(0,1){58}}
\put(381,0){\line(0,1){8}}
\put(392,0){\line(0,1){50}}
\put(402,0){\line(0,1){17}}
\put(412,0){\line(0,1){92}}
\put(423,0){\line(0,1){25}}
\put(433,0){\line(0,1){42}}
\put(443,0){\line(0,1){33}}
\put(453,0){\line(0,1){100}}
\put(464,0){\line(0,1){8}}
\put(474,0){\line(0,1){8}}
\put(484,0){\line(0,1){8}}
\put(495,0){\line(0,1){83}}
\put(515,0){\line(0,1){83}}
\put(526,0){\line(0,1){8}}
\put(536,0){\line(0,1){42}}
\put(557,0){\line(0,1){50}}
\put(567,0){\line(0,1){8}}
\put(577,0){\line(0,1){42}}
\put(598,0){\line(0,1){50}}
\put(618,0){\line(0,1){42}}
\put(639,0){\line(0,1){42}}
\put(649,0){\line(0,1){8}}
\put(660,0){\line(0,1){67}}
\put(680,0){\line(0,1){17}}
\put(690,0){\line(0,1){8}}
\put(701,0){\line(0,1){67}}
\put(721,0){\line(0,1){42}}
\put(732,0){\line(0,1){8}}
\put(742,0){\line(0,1){25}}
\put(763,0){\line(0,1){17}}
\put(773,0){\line(0,1){8}}
\put(783,0){\line(0,1){42}}
\put(794,0){\line(0,1){17}}
\put(804,0){\line(0,1){42}}
\put(814,0){\line(0,1){8}}

```

```

\put(824,0){\line(0,1){50}}
\put(835,0){\line(0,1){25}}
\put(845,0){\line(0,1){42}}
\put(855,0){\line(0,1){8}}
\put(866,0){\line(0,1){25}}
\put(886,0){\line(0,1){33}}
\put(897,0){\line(0,1){25}}
\put(907,0){\line(0,1){17}}
\put(917,0){\line(0,1){17}}
\put(928,0){\line(0,1){17}}
\put(938,0){\line(0,1){8}}
\put(948,0){\line(0,1){50}}
\put(969,0){\line(0,1){25}}
\put(989,0){\line(0,1){25}}
\put(1010,0){\line(0,1){17}}
\put(1031,0){\line(0,1){33}}
\put(1051,0){\line(0,1){25}}
\put(1072,0){\line(0,1){33}}
\put(1092,0){\line(0,1){25}}
\put(1113,0){\line(0,1){42}}
\put(1134,0){\line(0,1){8}}
\put(1154,0){\line(0,1){42}}
\put(1175,0){\line(0,1){50}}
\put(1195,0){\line(0,1){17}}
\put(1216,0){\line(0,1){25}}
\put(1237,0){\line(0,1){42}}
\put(1257,0){\line(0,1){8}}
\put(1278,0){\line(0,1){17}}
\put(1299,0){\line(0,1){25}}
\put(1340,0){\line(0,1){17}}
\put(1360,0){\line(0,1){17}}
\put(1381,0){\line(0,1){8}}
\put(1484,0){\line(0,1){8}}
\end{picture}

{\smaller
\begin{tabular}{r r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
342&2&94&1&4202&911.8&3150&3300&3550&4050&4750&5400&5650 \end{tabular}
\begin{verbatim}

lowest : 2700 2850 2900 2925 2975, highest: 5850 5950 6000 6050 6300

```

```

\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{Sex}

{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
333&11&2 \end{tabular}
\begin{verbatim}

Value      FEMALE    MALE
Frequency    165      168
Proportion  0.495    0.505
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\ vbox{\noindent\textbf{$\Delta$ 15 N (o/oo)}: \setlength{\unitlength}{0.001in}\hfill\begin{p
\put(0,0){\line(0,1){27}}
\put(25,0){\line(0,1){18}}
\put(37,0){\line(0,1){9}}
\put(75,0){\line(0,1){9}}
\put(87,0){\line(0,1){9}}
\put(100,0){\line(0,1){9}}
\put(112,0){\line(0,1){18}}
\put(125,0){\line(0,1){18}}
\put(150,0){\line(0,1){27}}
\put(162,0){\line(0,1){36}}
\put(175,0){\line(0,1){9}}
\put(200,0){\line(0,1){27}}
\put(212,0){\line(0,1){9}}
\put(225,0){\line(0,1){27}}
\put(237,0){\line(0,1){18}}
\put(250,0){\line(0,1){36}}
\put(275,0){\line(0,1){27}}
\put(287,0){\line(0,1){27}}
\put(300,0){\line(0,1){27}}
\put(312,0){\line(0,1){55}}
\put(325,0){\line(0,1){36}}
\put(337,0){\line(0,1){9}}

```

```

\put(350,0){\line(0,1){64}}
\put(362,0){\line(0,1){18}}
\put(375,0){\line(0,1){73}}
\put(387,0){\line(0,1){27}}
\put(400,0){\line(0,1){55}}
\put(412,0){\line(0,1){64}}
\put(424,0){\line(0,1){27}}
\put(437,0){\line(0,1){18}}
\put(449,0){\line(0,1){73}}
\put(462,0){\line(0,1){36}}
\put(474,0){\line(0,1){36}}
\put(487,0){\line(0,1){36}}
\put(499,0){\line(0,1){18}}
\put(512,0){\line(0,1){45}}
\put(524,0){\line(0,1){100}}
\put(537,0){\line(0,1){36}}
\put(549,0){\line(0,1){27}}
\put(562,0){\line(0,1){9}}
\put(574,0){\line(0,1){45}}
\put(587,0){\line(0,1){45}}
\put(599,0){\line(0,1){36}}
\put(612,0){\line(0,1){36}}
\put(624,0){\line(0,1){73}}
\put(637,0){\line(0,1){55}}
\put(649,0){\line(0,1){27}}
\put(662,0){\line(0,1){9}}
\put(674,0){\line(0,1){27}}
\put(687,0){\line(0,1){27}}
\put(699,0){\line(0,1){18}}
\put(712,0){\line(0,1){27}}
\put(724,0){\line(0,1){45}}
\put(737,0){\line(0,1){9}}
\put(749,0){\line(0,1){27}}
\put(762,0){\line(0,1){45}}
\put(774,0){\line(0,1){27}}
\put(787,0){\line(0,1){36}}
\put(799,0){\line(0,1){18}}
\put(812,0){\line(0,1){55}}
\put(824,0){\line(0,1){36}}
\put(836,0){\line(0,1){36}}
\put(849,0){\line(0,1){9}}
\put(861,0){\line(0,1){36}}

```

```

\put(874,0){\line(0,1){27}}
\put(886,0){\line(0,1){27}}
\put(899,0){\line(0,1){36}}
\put(911,0){\line(0,1){18}}
\put(924,0){\line(0,1){36}}
\put(936,0){\line(0,1){27}}
\put(949,0){\line(0,1){9}}
\put(961,0){\line(0,1){45}}
\put(974,0){\line(0,1){9}}
\put(986,0){\line(0,1){45}}
\put(999,0){\line(0,1){27}}
\put(1011,0){\line(0,1){27}}
\put(1024,0){\line(0,1){27}}
\put(1036,0){\line(0,1){27}}
\put(1049,0){\line(0,1){36}}
\put(1061,0){\line(0,1){9}}
\put(1074,0){\line(0,1){55}}
\put(1086,0){\line(0,1){18}}
\put(1099,0){\line(0,1){9}}
\put(1111,0){\line(0,1){27}}
\put(1124,0){\line(0,1){27}}
\put(1136,0){\line(0,1){55}}
\put(1161,0){\line(0,1){36}}
\put(1174,0){\line(0,1){18}}
\put(1186,0){\line(0,1){9}}
\put(1199,0){\line(0,1){9}}
\put(1224,0){\line(0,1){18}}
\put(1236,0){\line(0,1){18}}
\put(1248,0){\line(0,1){18}}
\put(1261,0){\line(0,1){18}}
\put(1273,0){\line(0,1){18}}
\put(1286,0){\line(0,1){18}}
\put(1298,0){\line(0,1){9}}
\put(1311,0){\line(0,1){18}}
\put(1323,0){\line(0,1){9}}
\put(1336,0){\line(0,1){9}}
\put(1348,0){\line(0,1){27}}
\put(1398,0){\line(0,1){9}}
\put(1436,0){\line(0,1){9}}
\put(1461,0){\line(0,1){9}}
\put(1486,0){\line(0,1){27}}
\end{picture}

```



```

{\smaller
\begin{tabular}{r r r r r r r r r r r }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
330&14&330&1&8.733&0.6323&7.897&8.047&8.300&8.652&9.172&9.491&9.689 \end{tabular}
\begin{verbatim}

lowest : 7.63220 7.63452 7.63884 7.68528 7.68870, highest: 9.93727 9.98044 10.02019 10.02019
\end{verbatim}
}
\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{$\Delta$ 13 C (o/oo)}: \setlength{\unitlength}{0.001in}\hfill\begin{p
\put(0,0){\line(0,1){7}}
\put(23,0){\line(0,1){7}}
\put(46,0){\line(0,1){7}}
\put(69,0){\line(0,1){60}}
\put(92,0){\line(0,1){53}}
\put(115,0){\line(0,1){53}}
\put(138,0){\line(0,1){53}}
\put(161,0){\line(0,1){33}}
\put(184,0){\line(0,1){80}}
\put(207,0){\line(0,1){27}}
\put(230,0){\line(0,1){27}}
\put(254,0){\line(0,1){33}}
\put(277,0){\line(0,1){67}}
\put(300,0){\line(0,1){47}}
\put(323,0){\line(0,1){47}}
\put(346,0){\line(0,1){53}}
\put(369,0){\line(0,1){80}}
\put(392,0){\line(0,1){60}}
\put(415,0){\line(0,1){87}}
\put(438,0){\line(0,1){100}}
\put(461,0){\line(0,1){47}}
\put(484,0){\line(0,1){20}}
\put(507,0){\line(0,1){40}}
\put(530,0){\line(0,1){27}}
\put(553,0){\line(0,1){53}}
\put(576,0){\line(0,1){20}}
\put(599,0){\line(0,1){33}}
\put(622,0){\line(0,1){7}}
\put(645,0){\line(0,1){27}}
\put(668,0){\line(0,1){27}}

```

```

\put(691,0){\line(0,1){53}}
\put(714,0){\line(0,1){53}}
\put(738,0){\line(0,1){73}}
\put(761,0){\line(0,1){20}}
\put(784,0){\line(0,1){27}}
\put(807,0){\line(0,1){40}}
\put(830,0){\line(0,1){33}}
\put(853,0){\line(0,1){20}}
\put(876,0){\line(0,1){40}}
\put(899,0){\line(0,1){47}}
\put(922,0){\line(0,1){27}}
\put(945,0){\line(0,1){7}}
\put(968,0){\line(0,1){20}}
\put(991,0){\line(0,1){13}}
\put(1014,0){\line(0,1){20}}
\put(1037,0){\line(0,1){27}}
\put(1060,0){\line(0,1){40}}
\put(1083,0){\line(0,1){53}}
\put(1106,0){\line(0,1){53}}
\put(1129,0){\line(0,1){47}}
\put(1152,0){\line(0,1){20}}
\put(1175,0){\line(0,1){33}}
\put(1198,0){\line(0,1){40}}
\put(1221,0){\line(0,1){33}}
\put(1245,0){\line(0,1){27}}
\put(1268,0){\line(0,1){20}}
\put(1314,0){\line(0,1){13}}
\put(1337,0){\line(0,1){7}}
\put(1429,0){\line(0,1){13}}
\put(1475,0){\line(0,1){7}}
\end{picture}

{\smaller[2]
\begin{tabular}{ rrrrrrrrrrr }
n&missing&distinct&Info&Mean&Gmd&.05&.10&.25&.50&.75&.90&.95 \\\
331&13&331&1&-25.69&0.9093&-26.79&-26.69&-26.32&-25.83&-25.06&-24.53&-24.36 \end{tabular}
\begin{verbatim}

lowest : -27.01854 -26.95470 -26.89644 -26.86485 -26.86352
highest: -24.16566 -24.10255 -23.90309 -23.89017 -23.78767
\end{verbatim}
}

```

```

\smallskip\hrule\smallskip
}
\vbox{\noindent\textbf{Comments}\setlength{\unitlength}{0.001in}\hfill\begin{picture}(1.5,.1)
\put(0,0){\line(0,1){3}}
\put(150,0){\line(0,1){3}}
\put(300,0){\line(0,1){100}}
\put(450,0){\line(0,1){3}}
\put(600,0){\line(0,1){6}}
\put(750,0){\line(0,1){6}}
\put(900,0){\line(0,1){3}}
\put(1050,0){\line(0,1){21}}
\put(1200,0){\line(0,1){12}}
\put(1350,0){\line(0,1){3}}
\end{picture}

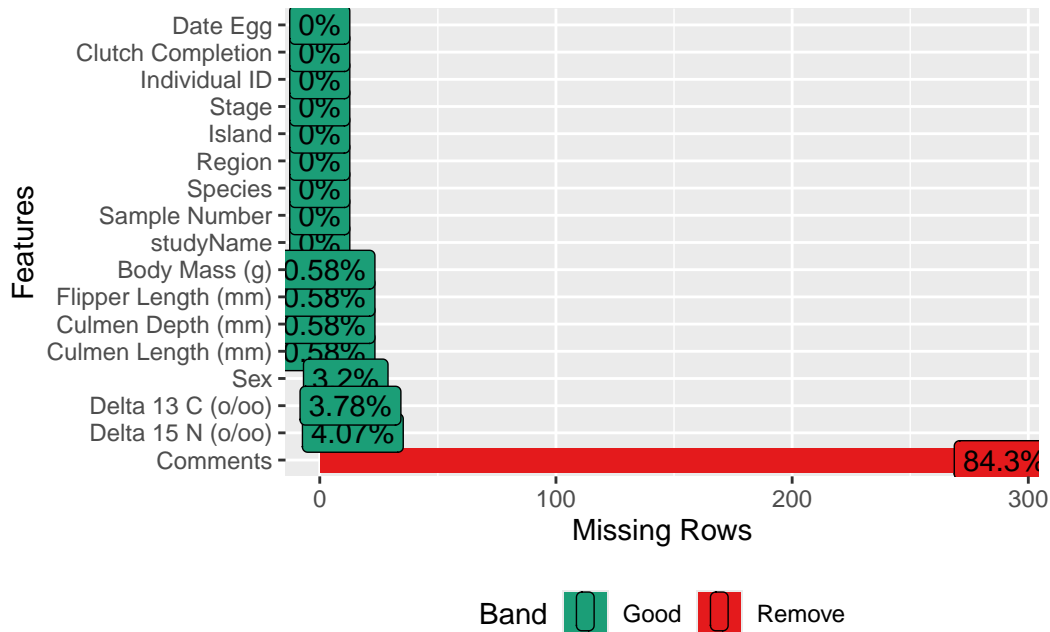
{\smaller
\begin{tabular}{r r r }
n&missing&distinct \\\
54&290&10 \end{tabular}
\begin{verbatim}

lowest : Adult not sampled.
highest: No blood sample obtained.
\end{verbatim}
}
\smallskip\hrule\smallskip
}
}\end{spacing}

```

Adult not sampled.  
No delta15N data

```
plot_missing(penguins_raw)
```



## Penguin mass vs. flipper length

```
library(ggplot2)
mass_flipper <- ggplot(data = penguins,
                       aes(x = flipper_length_mm,
                           y = body_mass_g)) +
  geom_point(aes(color = species,
                  shape = species),
             size = 3,
             alpha = 0.8) +
  scale_color_manual(values = c("darkorange", "purple", "cyan4")) +
  labs(title = "Penguin size, Palmer Station LTER",
       subtitle = "Flipper length and body mass for Adelie, Chinstrap and Gentoo Penguins",
       x = "Flipper length (mm)",
       y = "Body mass (g)",
       color = "Penguin species",
       shape = "Penguin species") +
  theme(legend.position = c(0.2, 0.7),
        plot.title.position = "plot",
```

```
plot.caption = element_text(hjust = 0, face = "italic"),
plot.caption.position = "plot")
```

Warning: A numeric `legend.position` argument in `theme()` was deprecated in ggplot2 3.5.0.

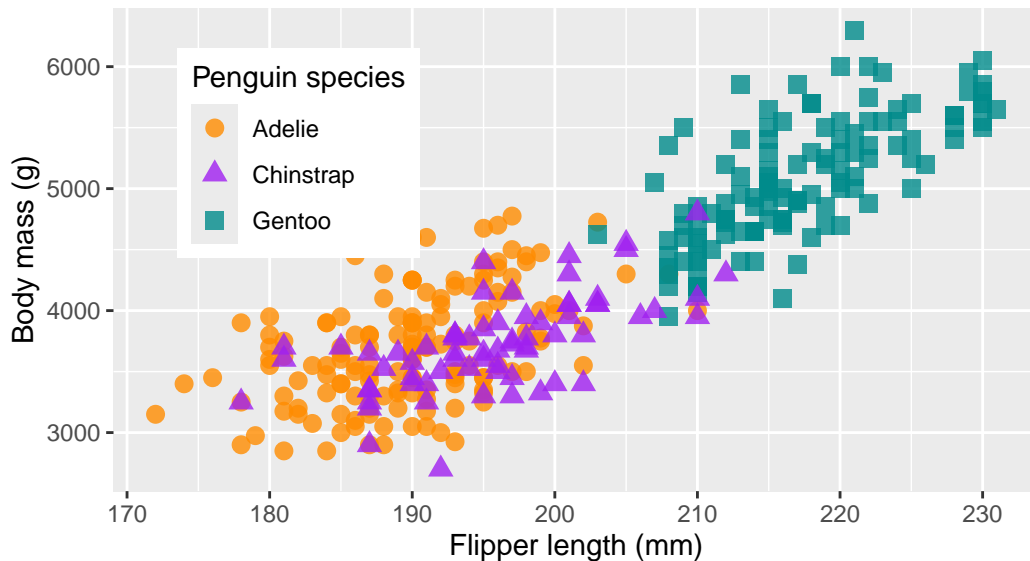
i Please use the `legend.position.inside` argument of `theme()` instead.

mass\_flipper

Warning: Removed 2 rows containing missing values or values outside the scale range (`geom\_point()`).

## Penguin size, Palmer Station LTER

Flipper length and body mass for Adelie, Chinstrap and Gentoo Penguins



## flipper\_hist

```
flipper_hist <- ggplot(data = penguins, aes(x = flipper_length_mm)) +
  geom_histogram(aes(fill = species),
    alpha = 0.5,
```

```

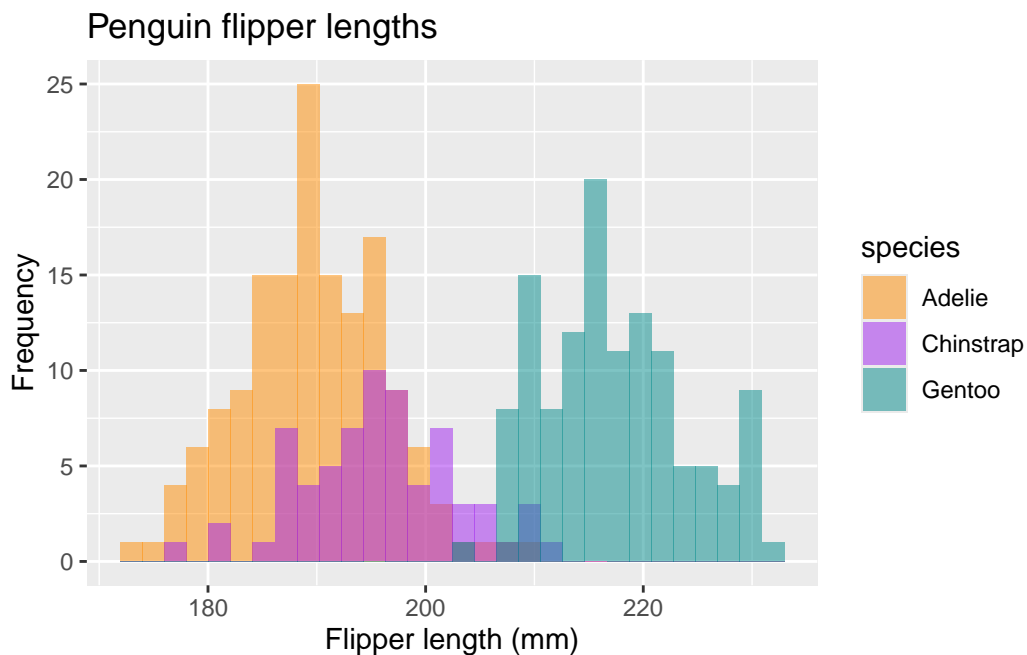
    position = "identity") +
  scale_fill_manual(values = c("darkorange", "purple", "cyan4")) +
  labs(x = "Flipper length (mm)",
       y = "Frequency",
       title = "Penguin flipper lengths")

flipper_hist

```

`stat\_bin()` using `bins = 30`. Pick better value with `binwidth`.

Warning: Removed 2 rows containing non-finite outside the scale range  
(`stat\_bin()`).



## Flipper lengths boxplots + jitter

```

flipper_box <- ggplot(data = penguins, aes(x = species, y = flipper_length_mm)) +
  geom_boxplot(aes(color = species), width = 0.3, show.legend = FALSE) +
  geom_jitter(aes(color = species), alpha = 0.5, show.legend = FALSE, position = position_jitter)

```

```
scale_color_manual(values = c("darkorange", "purple", "cyan4")) +
labs(x = "Species",
     y = "Flipper length (mm)")

flipper_box
```

Warning: Removed 2 rows containing non-finite outside the scale range  
(`stat\_boxplot()`).

Warning: Removed 2 rows containing missing values or values outside the scale range  
(`geom\_point()`).

