Homework 2

Summary Report for the Mushroom Dataset

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目錄

1.Variable Definition

Variable Name	Data Type	Definition
family	character	String of the name of the family of mushroom species
name	character	String of the of the mushroom species
class	categorical	poisonous=p, edibile=e
cap-diameter (m)	numerical	float number(s) in cm, two values = min-max, one value = mean
cap-shape (n)	categorical	bell = b, conical = c, convex = x, flat = f, sunken = s, spherical = p, others = o
cap-surface (n)	categorical	fibrous = i, grooves = g, scaly = y, smooth = s, shiny = h, leathery = l, silky = k, sticky = t, wrinkled = w, fleshy = e
cap-color (n)	categorical	brown = n, buff = b, gray = g, green = r, pink = p, purple = u, red = e, white = w, yellow = y, blue = l, orange = o, black = k
does-bruise-bleed (n)	categorical	bruises-or-bleeding = t, no = f
gill-attachment (n)	categorical	adnate = a, adnexed = x, decurrent = d, free = e, sinuate = s, pores = p, none = f, unknown = ?
gill-spacing (n)	categorical	close = c, distant = d, none = f
gill-color (n)	categorical	see cap-color + none = f
stem-height (m)	numerical	float number(s) in cm, two values = min-max, one value = mean
stem-width (m)	numerical	float number(s) in mm, two values = min-max, one value = mean
stem-root (n)	categorical	bulbous = b, swollen = s, club = c, cup = u, equal = e, rhizomorphs = z, rooted = r
stem-surface (n)	categorical	see cap-surface + none = f
stem-color (n)	categorical	see cap-color + none = f
veil-type (n)	categorical	partial = p, universal = u
veil-color (n)	categorical	see cap-color + none = f
has-ring (n)	categorical	ring = t, none = f
ring-type (n)	categorical	cobwebby = c, evanescent = e, flaring = r, grooved = g, large = l, pendant = p, sheathing = s, zone = z, scaly = y, movable = m, none = f, unknown = ?
spore-print-color (n)	categorical	brown = n, buff = b, gray = g, green = r, pink = p, purple = u, red = e, white = w, yellow = y, blue = l, orange = o, black = k
habitat (n)	categorical	grasses = g, leaves = l, meadows = m, paths = p, heaths = h, urban = u, waste = w, woods = d
season (n)	categorical	spring = s, summer = u, autumn = a, winter = w

圖 1: Variable Definition

2.Data Description

```
library(reticulate)
library(Hmisc)
```

```
data <- read.csv("D:\\Desktop\\2025Spring\\2025Spring_Statistical_Consulting\\Homework2\\mushroom\\prima
latex(describe(data), file="", options=list(tabenv="longtable"))
```

data
23 Variables 173 Observations

family

n	missing	distinct
173	0	23

```
lowest : Amanita Family     Bolbitius Family   Bolete Family      Bracket Fungi      Chanterelle Family
highest: Russula Family     Saddle-Cup Family  Stropharia Family  Tricholoma Family  Wax Gill Family
```

name

n	missing	distinct
173	0	173

```
lowest : Amethyst Deceiver        Aniseed Funnel Cap       Apricot Fungus           Bare-toothed Russula     Bay Bolete
highest: Yellow-gilled Russula    Yellow-staining Mushroom Yellow-stemmed Bell Cap  Yellow Swamp Russula     Yellow Wax cap
```

class

n	missing	distinct
173	0	2

Value	e	p
Frequency	77	96
Proportion	0.445	0.555

cap.diameter

n	missing	distinct
173	0	51

```
lowest : [0.4, 1]   [0.5, 1.5] [0.5, 1]   [0.7, 1.3] [1, 1.5]
highest: [8, 14]    [8, 15]    [8, 20]    [8, 25]    [8, 30]
```

cap.shape

n	missing	distinct
173	0	27

```
lowest : [b, f, s] [b, f]    [b, x, f] [b, x]    [b]
highest: [x, f]    [x, o]    [x, p]    [x, s]    [x]
```

Cap.surface

n	missing	distinct
133	40	40

```
lowest : [d, e, y, i] [d, k, s]    [d, k]       [d, s]       [d]
highest: [t]          [w, t]       [w]          [y, s]       [y]
```

cap.color

n	missing	distinct
173	0	67

```
lowest : [b, p, e, y]    [b, u]          [b]             [e, n, p, w]    [e, n, y]
highest: [y, n]          [y, o, g, n, r] [y, o, r, n]    [y, o]          [y]
```

does.bruise.or.bleed

n	missing	distinct
173	0	2

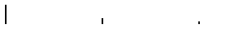
Value	[f]	[t]
Frequency	143	30
Proportion	0.827	0.173

gill.attachment

n	missing	distinct
145	28	8

Value	[a, d]	[a]	[d]	[e]	[f]	[p]	[s]	[x]
Frequency	8	32	25	16	10	17	16	21
Proportion	0.055	0.221	0.172	0.110	0.069	0.117	0.110	0.145

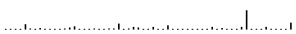
gill.spacing



n	missing	distinct
102	71	3

Value	[c]	[d]	[f]
Frequency	70	22	10
Proportion	0.686	0.216	0.098

gill.color



n	missing	distinct
173	0	59

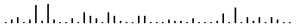
lowest : [b, p, w] [b, u] [b] [e] [f]
highest: [y, o, e] [y, r, k] [y, r] [y, w] [y]

stem.height

n	missing	distinct
173	0	46

lowest : [0] [1, 2] [1, 3] [10, 12] [10, 15], highest: [8, 12] [8, 15] [8, 20] [8, 25] [8, 30]

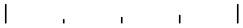
stem.width



n	missing	distinct
173	0	48

lowest : [0.5, 1] [0] [1, 2] [1, 3] [1] , highest: [7, 15] [8, 12] [8, 15] [8, 18] [8, 20]

stem.root



n	missing	distinct
27	146	5

Value	[b]	[c]	[f]	[r]	[s]
Frequency	9	2	3	4	9
Proportion	0.333	0.074	0.111	0.148	0.333

stem.surface

n	missing	distinct
65	108	14

Value	[f]	[g]	[h]	[i, s]	[i, t]	[i, y]	[i]	[k, s]	[k]	[s, h]	[s]	[t]
Frequency	3	5	1	1	1	1	11	1	4	1	15	7
Proportion	0.046	0.077	0.015	0.015	0.015	0.015	0.169	0.015	0.062	0.015	0.231	0.108

Value	[y, s]	[y]
Frequency	1	13
Proportion	0.015	0.200

stem.color

n	missing	distinct
173	0	41

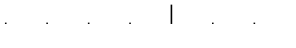
lowest : [b, u] [e, n] [e, u, y] [e, y] [e]
highest: [w] [y, e, n] [y, n] [y, o, k] [y]

veil.type

n	missing	distinct	value
9	164	1	[u]

Value	[u]
Frequency	9
Proportion	1

veil.color



n	missing	distinct
21	152	7

Value	[e, n]	[k]	[n]	[u]	[w]	[y, w]	[y]
Frequency	1	1	1	1	15	1	1
Proportion	0.048	0.048	0.048	0.048	0.714	0.048	0.048

has.ring

```
   n    missing    distinct
 173          0           2

Value        [f]   [t]
Frequency    130    43
Proportion 0.751 0.249
```

ring.type

```
   n    missing    distinct
 166          7          13

Value      [e, g]    [e]    [f] [g, p]    [g] [l, e] [l, p] [l, r]    [l]    [m]    [p]    [r]
Frequency       1      6    137      2      2      1      1      2      2      1      2      3
Proportion  0.006  0.036  0.825  0.012  0.012  0.006  0.006  0.012  0.012  0.006  0.012  0.018

Value         [z]
Frequency       6
Proportion  0.036
```

Spore.print.color

```
   n    missing    distinct
  18        155           8

Value         [g] [k, r] [k, u]    [k]    [n] [p, w]    [p]    [w]
Frequency       1      1      1      5      3      1      3      3
Proportion  0.056  0.056  0.056  0.278  0.167  0.056  0.167  0.167
```

habitat

```
   n    missing    distinct
 173          0          21

lowest : [d, h]    [d]       [g, d, h] [g, d]    [g, h, d]
highest: [m, d]    [m, h]    [m]       [p, d]    [w]
```

season

```
   n    missing    distinct
 173          0          10

Value            [a, w]          [a]    [s, a, w] [s, u, a, w]    [s, u, a]       [s, u]
Frequency            15           16            1           13            5            3
Proportion        0.087        0.092        0.006        0.075        0.029        0.017

Value                [s]    [u, a, w]       [u, a]          [u]
Frequency              1           12          106            1
Proportion         0.006        0.069        0.613        0.006
```

3.Table 1

```
library(dplyr)
library(tidyr)
library(stringr)
library(table1)

numerical_cols <- c("cap.diameter", "stem.height", "stem.width")
categorical_cols <- setdiff(colnames(data), c("family", "name", "class", numerical_cols))

expand_categorical_features <- function(df, categorical_cols) {
  df_expanded <- df

  for (col in categorical_cols) {
    df_expanded <- df_expanded %>%
      mutate(!!sym(col) := str_split(!!sym(col), ",\\s*")) %>%  # Split and trim spaces
      unnest(!!sym(col)) %>%
      mutate(!!sym(col) := str_replace_all(!!sym(col), "[\\[\\]]", ""))  # Remove brackets
  }
```

```
  return(df_expanded)
}

expanded_list <- expand_categorical_features(data, categorical_cols)

formula <- as.formula(paste("~", paste(c(categorical_cols, numerical_cols), collapse = " + "), " | class

table1(formula, data = expanded_list)
```

	e	p	Overall
	(N=2427)	(N=4988)	(N=7415)
cap.shape			
b	44 (1.8%)	1403 (28.1%)	1447 (19.5%)
c	36 (1.5%)	124 (2.5%)	160 (2.2%)
f	745 (30.7%)	924 (18.5%)	1669 (22.5%)
o	16 (0.7%)	148 (3.0%)	164 (2.2%)
p	176 (7.3%)	116 (2.3%)	292 (3.9%)
s	286 (11.8%)	440 (8.8%)	726 (9.8%)
x	1124 (46.3%)	1833 (36.7%)	2957 (39.9%)
Cap.surface			
	494 (20.4%)	327 (6.6%)	821 (11.1%)
d	242 (10.0%)	368 (7.4%)	610 (8.2%)
e	57 (2.3%)	130 (2.6%)	187 (2.5%)
g	148 (6.1%)	168 (3.4%)	316 (4.3%)
h	260 (10.7%)	577 (11.6%)	837 (11.3%)
i	24 (1.0%)	281 (5.6%)	305 (4.1%)
k	6 (0.2%)	168 (3.4%)	174 (2.3%)
l	28 (1.2%)	76 (1.5%)	104 (1.4%)
s	614 (25.3%)	536 (10.7%)	1150 (15.5%)
t	256 (10.5%)	1434 (28.7%)	1690 (22.8%)
w	78 (3.2%)	196 (3.9%)	274 (3.7%)
y	220 (9.1%)	727 (14.6%)	947 (12.8%)
cap.color			
b	87 (3.6%)	20 (0.4%)	107 (1.4%)
e	132 (5.4%)	325 (6.5%)	457 (6.2%)
g	204 (8.4%)	366 (7.3%)	570 (7.7%)
k	48 (2.0%)	338 (6.8%)	386 (5.2%)
l	62 (2.6%)	656 (13.2%)	718 (9.7%)
n	813 (33.5%)	915 (18.3%)	1728 (23.3%)
n	2 (0.1%)	0 (0%)	2 (0.0%)
o	290 (11.9%)	381 (7.6%)	671 (9.0%)
p	86 (3.5%)	189 (3.8%)	275 (3.7%)
r	51 (2.1%)	1048 (21.0%)	1099 (14.8%)
u	77 (3.2%)	73 (1.5%)	150 (2.0%)
w	418 (17.2%)	212 (4.3%)	630 (8.5%)
y	157 (6.5%)	465 (9.3%)	622 (8.4%)
does.bruise.or.bleed			
f	2207 (90.9%)	3936 (78.9%)	6143 (82.8%)
t	220 (9.1%)	1052 (21.1%)	1272 (17.2%)
gill.attachment			
	145 (6.0%)	512 (10.3%)	657 (8.9%)
a	812 (33.5%)	953 (19.1%)	1765 (23.8%)
d	364 (15.0%)	1062 (21.3%)	1426 (19.2%)

	e	p	Overall
e	372 (15.3%)	568 (11.4%)	940 (12.7%)
f	34 (1.4%)	46 (0.9%)	80 (1.1%)
p	136 (5.6%)	108 (2.2%)	244 (3.3%)
s	312 (12.9%)	1411 (28.3%)	1723 (23.2%)
x	252 (10.4%)	328 (6.6%)	580 (7.8%)
gill.spacing			
	732 (30.2%)	1846 (37.0%)	2578 (34.8%)
c	993 (40.9%)	2914 (58.4%)	3907 (52.7%)
d	668 (27.5%)	182 (3.6%)	850 (11.5%)
f	34 (1.4%)	46 (0.9%)	80 (1.1%)
gill.color			
b	137 (5.6%)	224 (4.5%)	361 (4.9%)
e	112 (4.6%)	41 (0.8%)	153 (2.1%)
f	34 (1.4%)	46 (0.9%)	80 (1.1%)
g	164 (6.8%)	723 (14.5%)	887 (12.0%)
k	166 (6.8%)	264 (5.3%)	430 (5.8%)
n	318 (13.1%)	1029 (20.6%)	1347 (18.2%)
o	196 (8.1%)	174 (3.5%)	370 (5.0%)
p	220 (9.1%)	184 (3.7%)	404 (5.4%)
r	84 (3.5%)	285 (5.7%)	369 (5.0%)
u	82 (3.4%)	455 (9.1%)	537 (7.2%)
w	650 (26.8%)	727 (14.6%)	1377 (18.6%)
y	264 (10.9%)	836 (16.8%)	1100 (14.8%)
stem.root			
	2147 (88.5%)	4564 (91.5%)	6711 (90.5%)
b	144 (5.9%)	72 (1.4%)	216 (2.9%)
s	136 (5.6%)	96 (1.9%)	232 (3.1%)
c	0 (0%)	40 (0.8%)	40 (0.5%)
f	0 (0%)	32 (0.6%)	32 (0.4%)
r	0 (0%)	184 (3.7%)	184 (2.5%)
stem.surface			
	1661 (68.4%)	2232 (44.7%)	3893 (52.5%)
i	116 (4.8%)	290 (5.8%)	406 (5.5%)
k	100 (4.1%)	92 (1.8%)	192 (2.6%)
s	358 (14.8%)	282 (5.7%)	640 (8.6%)
t	136 (5.6%)	519 (10.4%)	655 (8.8%)
y	56 (2.3%)	1449 (29.0%)	1505 (20.3%)
f	0 (0%)	32 (0.6%)	32 (0.4%)
g	0 (0%)	52 (1.0%)	52 (0.7%)
h	0 (0%)	40 (0.8%)	40 (0.5%)
stem.color			
b	64 (2.6%)	0 (0%)	64 (0.9%)
e	128 (5.3%)	56 (1.1%)	184 (2.5%)
g	93 (3.8%)	278 (5.6%)	371 (5.0%)
k	2 (0.1%)	204 (4.1%)	206 (2.8%)
l	24 (1.0%)	432 (8.7%)	456 (6.1%)
n	488 (20.1%)	1327 (26.6%)	1815 (24.5%)
o	242 (10.0%)	264 (5.3%)	506 (6.8%)
p	36 (1.5%)	22 (0.4%)	58 (0.8%)
r	24 (1.0%)	456 (9.1%)	480 (6.5%)
u	112 (4.6%)	73 (1.5%)	185 (2.5%)
w	1096 (45.2%)	1084 (21.7%)	2180 (29.4%)

	e	p	Overall
y	118 (4.9%)	760 (15.2%)	878 (11.8%)
f	0 (0%)	32 (0.6%)	32 (0.4%)
veil.type			
	2391 (98.5%)	4860 (97.4%)	7251 (97.8%)
u	36 (1.5%)	128 (2.6%)	164 (2.2%)
veil.color			
	2235 (92.1%)	4778 (95.8%)	7013 (94.6%)
w	180 (7.4%)	164 (3.3%)	344 (4.6%)
y	12 (0.5%)	0 (0%)	12 (0.2%)
e	0 (0%)	4 (0.1%)	4 (0.1%)
k	0 (0%)	16 (0.3%)	16 (0.2%)
n	0 (0%)	8 (0.2%)	8 (0.1%)
u	0 (0%)	18 (0.4%)	18 (0.2%)
has.ring			
f	1918 (79.0%)	2942 (59.0%)	4860 (65.5%)
t	509 (21.0%)	2046 (41.0%)	2555 (34.5%)
ring.type			
	96 (4.0%)	124 (2.5%)	220 (3.0%)
e	228 (9.4%)	1376 (27.6%)	1604 (21.6%)
f	1919 (79.1%)	2994 (60.0%)	4913 (66.3%)
g	20 (0.8%)	36 (0.7%)	56 (0.8%)
l	72 (3.0%)	18 (0.4%)	90 (1.2%)
m	16 (0.7%)	0 (0%)	16 (0.2%)
p	20 (0.8%)	32 (0.6%)	52 (0.7%)
r	56 (2.3%)	120 (2.4%)	176 (2.4%)
z	0 (0%)	288 (5.8%)	288 (3.9%)
Spore.print.color			
	2247 (92.6%)	3435 (68.9%)	5682 (76.6%)
g	12 (0.5%)	0 (0%)	12 (0.2%)
k	8 (0.3%)	728 (14.6%)	736 (9.9%)
p	16 (0.7%)	32 (0.6%)	48 (0.6%)
w	144 (5.9%)	16 (0.3%)	160 (2.2%)
n	0 (0%)	105 (2.1%)	105 (1.4%)
r	0 (0%)	24 (0.5%)	24 (0.3%)
u	0 (0%)	648 (13.0%)	648 (8.7%)
habitat			
d	1463 (60.3%)	2322 (46.6%)	3785 (51.0%)
g	388 (16.0%)	1339 (26.8%)	1727 (23.3%)
h	62 (2.6%)	87 (1.7%)	149 (2.0%)
l	170 (7.0%)	316 (6.3%)	486 (6.6%)
m	264 (10.9%)	890 (17.8%)	1154 (15.6%)
u	48 (2.0%)	0 (0%)	48 (0.6%)
w	32 (1.3%)	0 (0%)	32 (0.4%)
p	0 (0%)	34 (0.7%)	34 (0.5%)
season			
a	1043 (43.0%)	2437 (48.9%)	3480 (46.9%)
s	176 (7.3%)	123 (2.5%)	299 (4.0%)
u	682 (28.1%)	2188 (43.9%)	2870 (38.7%)
w	526 (21.7%)	240 (4.8%)	766 (10.3%)
cap.diameter			
[0.5, 1.5]	64 (2.6%)	16 (0.3%)	80 (1.1%)
[1, 2]	144 (5.9%)	29 (0.6%)	173 (2.3%)

	e	p	Overall
[1, 4]	28 (1.2%)	128 (2.6%)	156 (2.1%)
[10, 25]	16 (0.7%)	18 (0.4%)	34 (0.5%)
[12, 18]	8 (0.3%)	0 (0%)	8 (0.1%)
[12, 25]	24 (1.0%)	0 (0%)	24 (0.3%)
[2, 10]	6 (0.2%)	0 (0%)	6 (0.1%)
[2, 4]	8 (0.3%)	512 (10.3%)	520 (7.0%)
[2, 5]	284 (11.7%)	195 (3.9%)	479 (6.5%)
[2, 6]	36 (1.5%)	1420 (28.5%)	1456 (19.6%)
[2, 7]	192 (7.9%)	8 (0.2%)	200 (2.7%)
[2, 8]	12 (0.5%)	0 (0%)	12 (0.2%)
[3, 10]	252 (10.4%)	48 (1.0%)	300 (4.0%)
[3, 5]	8 (0.3%)	24 (0.5%)	32 (0.4%)
[3, 6]	184 (7.6%)	84 (1.7%)	268 (3.6%)
[3, 7]	24 (1.0%)	17 (0.3%)	41 (0.6%)
[3, 8]	28 (1.2%)	130 (2.6%)	158 (2.1%)
[4, 10]	54 (2.2%)	70 (1.4%)	124 (1.7%)
[4, 12]	24 (1.0%)	25 (0.5%)	49 (0.7%)
[4, 8]	70 (2.9%)	332 (6.7%)	402 (5.4%)
[4, 9]	20 (0.8%)	16 (0.3%)	36 (0.5%)
[5, 10]	104 (4.3%)	132 (2.6%)	236 (3.2%)
[5, 12]	68 (2.8%)	32 (0.6%)	100 (1.3%)
[5, 15]	334 (13.8%)	4 (0.1%)	338 (4.6%)
[5, 18]	16 (0.7%)	0 (0%)	16 (0.2%)
[5, 20]	48 (2.0%)	0 (0%)	48 (0.6%)
[50]	4 (0.2%)	0 (0%)	4 (0.1%)
[6, 10]	32 (1.3%)	8 (0.2%)	40 (0.5%)
[6, 12]	28 (1.2%)	26 (0.5%)	54 (0.7%)
[6, 14]	1 (0.0%)	0 (0%)	1 (0.0%)
[7, 15]	112 (4.6%)	24 (0.5%)	136 (1.8%)
[8, 12]	16 (0.7%)	0 (0%)	16 (0.2%)
[8, 15]	6 (0.2%)	0 (0%)	6 (0.1%)
[8, 20]	48 (2.0%)	24 (0.5%)	72 (1.0%)
[8, 25]	108 (4.5%)	24 (0.5%)	132 (1.8%)
[8, 30]	16 (0.7%)	48 (1.0%)	64 (0.9%)
[0.4, 1]	0 (0%)	16 (0.3%)	16 (0.2%)
[0.5, 1]	0 (0%)	48 (1.0%)	48 (0.6%)
[0.7, 1.3]	0 (0%)	8 (0.2%)	8 (0.1%)
[1, 1.5]	0 (0%)	6 (0.1%)	6 (0.1%)
[1, 3]	0 (0%)	98 (2.0%)	98 (1.3%)
[10, 15]	0 (0%)	16 (0.3%)	16 (0.2%)
[10, 20]	0 (0%)	48 (1.0%)	48 (0.6%)
[2, 3]	0 (0%)	16 (0.3%)	16 (0.2%)
[3, 12]	0 (0%)	96 (1.9%)	96 (1.3%)
[4, 7]	0 (0%)	432 (8.7%)	432 (5.8%)
[5, 14]	0 (0%)	16 (0.3%)	16 (0.2%)
[6, 15]	0 (0%)	98 (2.0%)	98 (1.3%)
[6, 18]	0 (0%)	32 (0.6%)	32 (0.4%)
[7, 20]	0 (0%)	648 (13.0%)	648 (8.7%)
[8, 14]	0 (0%)	16 (0.3%)	16 (0.2%)
stem.height			
[10, 15]	16 (0.7%)	4 (0.1%)	20 (0.3%)
[12, 20]	24 (1.0%)	0 (0%)	24 (0.3%)

	e	p	Overall
[15, 35]	16 (0.7%)	0 (0%)	16 (0.2%)
[2, 3]	16 (0.7%)	0 (0%)	16 (0.2%)
[2, 4]	16 (0.7%)	84 (1.7%)	100 (1.3%)
[2, 5]	8 (0.3%)	175 (3.5%)	183 (2.5%)
[2, 6]	4 (0.2%)	24 (0.5%)	28 (0.4%)
[2, 7]	4 (0.2%)	0 (0%)	4 (0.1%)
[2, 8]	6 (0.2%)	0 (0%)	6 (0.1%)
[3, 10]	212 (8.7%)	72 (1.4%)	284 (3.8%)
[3, 4]	16 (0.7%)	8 (0.2%)	24 (0.3%)
[3, 6]	328 (13.5%)	142 (2.8%)	470 (6.3%)
[3, 7]	94 (3.9%)	22 (0.4%)	116 (1.6%)
[3, 8]	80 (3.3%)	128 (2.6%)	208 (2.8%)
[4, 10]	348 (14.3%)	497 (10.0%)	845 (11.4%)
[4, 6]	73 (3.0%)	1092 (21.9%)	1165 (15.7%)
[4, 7]	48 (2.0%)	168 (3.4%)	216 (2.9%)
[4, 8]	402 (16.6%)	1546 (31.0%)	1948 (26.3%)
[5, 10]	184 (7.6%)	64 (1.3%)	248 (3.3%)
[5, 12]	52 (2.1%)	64 (1.3%)	116 (1.6%)
[5, 15]	48 (2.0%)	204 (4.1%)	252 (3.4%)
[5, 7]	24 (1.0%)	12 (0.2%)	36 (0.5%)
[5, 8]	60 (2.5%)	12 (0.2%)	72 (1.0%)
[5, 9]	8 (0.3%)	0 (0%)	8 (0.1%)
[6, 12]	36 (1.5%)	66 (1.3%)	102 (1.4%)
[7, 11]	64 (2.6%)	0 (0%)	64 (0.9%)
[7, 15]	4 (0.2%)	0 (0%)	4 (0.1%)
[7, 9]	48 (2.0%)	0 (0%)	48 (0.6%)
[8, 10]	16 (0.7%)	0 (0%)	16 (0.2%)
[8, 12]	8 (0.3%)	16 (0.3%)	24 (0.3%)
[8, 15]	4 (0.2%)	0 (0%)	4 (0.1%)
[8, 25]	16 (0.7%)	0 (0%)	16 (0.2%)
[8, 30]	144 (5.9%)	0 (0%)	144 (1.9%)
[0]	0 (0%)	32 (0.6%)	32 (0.4%)
[1, 2]	0 (0%)	96 (1.9%)	96 (1.3%)
[1, 3]	0 (0%)	8 (0.2%)	8 (0.1%)
[10, 12]	0 (0%)	24 (0.5%)	24 (0.3%)
[10, 20]	0 (0%)	8 (0.2%)	8 (0.1%)
[15, 20]	0 (0%)	48 (1.0%)	48 (0.6%)
[3, 5]	0 (0%)	56 (1.1%)	56 (0.8%)
[4, 5]	0 (0%)	72 (1.4%)	72 (1.0%)
[6, 10]	0 (0%)	82 (1.6%)	82 (1.1%)
[6, 14]	0 (0%)	16 (0.3%)	16 (0.2%)
[6, 15]	0 (0%)	26 (0.5%)	26 (0.4%)
[6, 18]	0 (0%)	96 (1.9%)	96 (1.3%)
[8, 20]	0 (0%)	24 (0.5%)	24 (0.3%)
stem.width			
[1, 2]	24 (1.0%)	25 (0.5%)	49 (0.7%)
[1, 3]	72 (3.0%)	0 (0%)	72 (1.0%)
[1]	48 (2.0%)	56 (1.1%)	104 (1.4%)
[10, 15]	524 (21.6%)	355 (7.1%)	879 (11.9%)
[10, 18]	32 (1.3%)	16 (0.3%)	48 (0.6%)
[10, 20]	86 (3.5%)	220 (4.4%)	306 (4.1%)
[10, 25]	16 (0.7%)	9 (0.2%)	25 (0.3%)

	e	p	Overall
[10, 30]	4 (0.2%)	0 (0%)	4 (0.1%)
[10, 60]	4 (0.2%)	0 (0%)	4 (0.1%)
[10]	40 (1.6%)	32 (0.6%)	72 (1.0%)
[12, 18]	4 (0.2%)	0 (0%)	4 (0.1%)
[15, 20]	90 (3.7%)	96 (1.9%)	186 (2.5%)
[15, 25]	205 (8.4%)	18 (0.4%)	223 (3.0%)
[15, 30]	220 (9.1%)	96 (1.9%)	316 (4.3%)
[2, 3]	64 (2.6%)	106 (2.1%)	170 (2.3%)
[2, 4]	12 (0.5%)	108 (2.2%)	120 (1.6%)
[2, 5]	48 (2.0%)	0 (0%)	48 (0.6%)
[20, 25]	4 (0.2%)	0 (0%)	4 (0.1%)
[20, 30]	70 (2.9%)	652 (13.1%)	722 (9.7%)
[20, 40]	16 (0.7%)	64 (1.3%)	80 (1.1%)
[20, 80]	12 (0.5%)	0 (0%)	12 (0.2%)
[3, 5]	48 (2.0%)	32 (0.6%)	80 (1.1%)
[3, 6]	12 (0.5%)	24 (0.5%)	36 (0.5%)
[3, 7]	24 (1.0%)	0 (0%)	24 (0.3%)
[3, 8]	192 (7.9%)	29 (0.6%)	221 (3.0%)
[30, 40]	24 (1.0%)	0 (0%)	24 (0.3%)
[4, 8]	56 (2.3%)	500 (10.0%)	556 (7.5%)
[40, 100]	16 (0.7%)	0 (0%)	16 (0.2%)
[5, 10]	108 (4.5%)	1844 (37.0%)	1952 (26.3%)
[5, 8]	224 (9.2%)	144 (2.9%)	368 (5.0%)
[6, 10]	6 (0.2%)	16 (0.3%)	22 (0.3%)
[6, 12]	68 (2.8%)	48 (1.0%)	116 (1.6%)
[8, 12]	32 (1.3%)	16 (0.3%)	48 (0.6%)
[8, 15]	16 (0.7%)	24 (0.5%)	40 (0.5%)
[8, 20]	6 (0.2%)	0 (0%)	6 (0.1%)
[0.5, 1]	0 (0%)	8 (0.2%)	8 (0.1%)
[0]	0 (0%)	32 (0.6%)	32 (0.4%)
[15, 40]	0 (0%)	16 (0.3%)	16 (0.2%)
[2]	0 (0%)	8 (0.2%)	8 (0.1%)
[20, 50]	0 (0%)	24 (0.5%)	24 (0.3%)
[20, 60]	0 (0%)	48 (1.0%)	48 (0.6%)
[3, 4]	0 (0%)	152 (3.0%)	152 (2.0%)
[4, 5]	0 (0%)	6 (0.1%)	6 (0.1%)
[4, 6]	0 (0%)	72 (1.4%)	72 (1.0%)
[4, 7]	0 (0%)	70 (1.4%)	70 (0.9%)
[5, 12]	0 (0%)	4 (0.1%)	4 (0.1%)
[7, 15]	0 (0%)	16 (0.3%)	16 (0.2%)
[8, 18]	0 (0%)	2 (0.0%)	2 (0.0%)

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# With the help from Chat-GPT
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