1. freq.table <- table(VLBWI$sex)

head(freq.table)

female male

320 330

1. summary( VLBWI$race)

Length Class Mode

671 character character

3.

b<- filter(VLBWI, race=="black",vent==1, sex=="female")

head(b, 3)

# A tibble: 3 × 21

patnum hospstay lowph pltct race bwt gest inout twn lol magsulf

<dbl> <dbl> <dbl> <dbl> <chr> <dbl> <dbl> <chr> <dbl> <dbl> <dbl>

1 3 -2 7.06 114 black 620 23 born… 0 NA NA

2 5 2 6.97 54 black 925 28 born… 0 NA NA

3 22 70 7.13 229 black 1120 29 born… 0 NA NA

# … with 10 more variables: meth <dbl>, toc <dbl>, delivery <chr>,

# apg1 <dbl>, vent <dbl>, pneumo <dbl>, pda <dbl>, cld <dbl>,

# sex <chr>, dead <dbl>

# ℹ Use `colnames()` to see all variable names

4.

col1<- mutate(VLBWI, sub1= lowph>7)

tail(col1)

head(col1)

A tibble: 6 × 22

patnum hospstay lowph pltct race bwt gest inout twn lol magsulf

<dbl> <dbl> <dbl> <dbl> <chr> <dbl> <dbl> <chr> <dbl> <dbl> <dbl>

1 1 34 NA 100 white 1250 35 born… 0 NA NA

2 2 9 7.25 244 white 1370 32 born… 0 NA NA

3 3 -2 7.06 114 black 620 23 born… 0 NA NA

4 4 40 7.25 182 black 1480 32 born… 0 NA NA

5 5 2 6.97 54 black 925 28 born… 0 NA NA

6 6 62 7.19 NA white 940 28 born… 0 NA NA

# … with 11 more variables: meth <dbl>, toc <dbl>, delivery <chr>,

# apg1 <dbl>, vent <dbl>, pneumo <dbl>, pda <dbl>, cld <dbl>,

# sex <chr>, dead <dbl>, sub1 <lgl>

# ℹ Use `colnames()` to see all variable names

5. newdata<- arrange(col1,delivery, twn)

head(newdata)

A tibble: 6 × 22

patnum hospstay lowph pltct race bwt gest inout twn lol magsulf

<dbl> <dbl> <dbl> <dbl> <chr> <dbl> <dbl> <chr> <dbl> <dbl> <dbl>

1 1 34 NA 100 white 1250 35 born… 0 NA NA

2 2 9 7.25 244 white 1370 32 born… 0 NA NA

3 5 2 6.97 54 black 925 28 born… 0 NA NA

4 6 62 7.19 NA white 940 28 born… 0 NA NA

5 10 28 7.16 153 black 1350 34 born… 0 NA NA

6 14 69 7.42 361 white 1180 28 born… 0 NA NA

# … with 11 more variables: meth <dbl>, toc <dbl>, delivery <chr>,

# apg1 <dbl>, vent <dbl>, pneumo <dbl>, pda <dbl>, cld <dbl>,

# sex <chr>, dead <dbl>, sub1 <lgl>

# ℹ Use `colnames()` to see all variable names

6. str(newdata)

tibble [671 × 22] (S3: tbl\_df/tbl/data.frame)

$ patnum : num [1:671] 1 2 5 6 10 14 17 23 29 31 ...

$ hospstay: num [1:671] 34 9 2 62 28 69 44 85 29 75 ...

$ lowph : num [1:671] NA 7.25 6.97 7.19 7.16 ...

$ pltct : num [1:671] 100 244 54 NA 153 361 186 68 170 179 ...

$ race : chr [1:671] "white" "white" "black" "white" ...

$ bwt : num [1:671] 1250 1370 925 940 1350 1180 1490 740 1300 970 ...

$ gest : num [1:671] 35 32 28 28 34 28 33 26 31 29 ...

$ inout : chr [1:671] "born at duke" "born at duke" "born at duke" "born at duke" ...

$ twn : num [1:671] 0 0 0 0 0 0 0 0 0 0 ...

$ lol : num [1:671] NA NA NA NA NA NA NA NA NA NA ...

$ magsulf : num [1:671] NA NA NA NA NA NA NA NA NA NA ...

$ meth : num [1:671] 0 1 0 1 1 0 1 0 0 0 ...

$ toc : num [1:671] 0 0 0 0 0 0 0 0 0 1 ...

$ delivery: chr [1:671] "abdominal" "abdominal" "abdominal" "abdominal" ...

$ apg1 : num [1:671] 8 7 5 8 4 6 8 9 1 1 ...

$ vent : num [1:671] 0 0 1 1 0 0 0 0 1 1 ...

$ pneumo : num [1:671] 0 0 1 0 0 0 0 0 1 0 ...

$ pda : num [1:671] 0 0 0 0 0 0 0 0 0 0 ...

$ cld : num [1:671] 0 0 0 0 0 0 0 0 0 1 ...

$ sex : chr [1:671] "female" "female" "female" "female" ...

$ dead : num [1:671] 0 0 1 0 0 0 0 0 0 0 ...

$ sub1 : logi [1:671] NA TRUE FALSE TRUE TRUE TRUE ...

7.

gp <- group\_by(VLBWI,race,sex)

mn <- summarise(gp)

head(mn)

> head(mn)

# A tibble: 6 × 2

# Groups: race [3]

**race sex**

<chr> <chr>

1 black female

2 black male

3 native american female

4 native american male

5 oriental female

6 oriental male

----------------------------------------------------------------------------------

summary(gp)

summary(gp)

patnum hospstay lowph pltct

Min. : 1.0 Min. :-6574.00 Min. :6.530 Min. : 16.0

1st Qu.:168.5 1st Qu.: 16.00 1st Qu.:7.130 1st Qu.:143.0

Median :336.0 Median : 37.00 Median :7.210 Median :202.0

Mean :336.0 Mean : 40.36 Mean :7.202 Mean :201.6

3rd Qu.:503.5 3rd Qu.: 62.00 3rd Qu.:7.310 3rd Qu.:252.0

Max. :671.0 Max. : 3668.00 Max. :7.550 Max. :571.0

NA's :31 NA's :62 NA's :70

race bwt gest inout

Length:671 Min. : 400 Min. :22.00 Length:671

Class :character 1st Qu.: 900 1st Qu.:27.00 Class :character

Mode :character Median :1120 Median :29.00 Mode :character

Mean :1094 Mean :28.87

3rd Qu.:1310 3rd Qu.:31.00

Max. :1580 Max. :40.00

NA's :2 NA's :4

twn lol magsulf meth

Min. :0.0000 Min. : 0.000 Min. :0.0000 Min. :0.0000

1st Qu.:0.0000 1st Qu.: 0.000 1st Qu.:0.0000 1st Qu.:0.0000

Median :0.0000 Median : 3.500 Median :0.0000 Median :0.0000

Mean :0.2074 Mean : 8.438 Mean :0.1344 Mean :0.4372

3rd Qu.:0.0000 3rd Qu.: 9.000 3rd Qu.:0.0000 3rd Qu.:1.0000

Max. :1.0000 Max. :192.000 Max. :1.0000 Max. :1.0000

NA's :20 NA's :381 NA's :247 NA's :106

toc delivery apg1 vent

Min. :0.0000 Length:671 Min. :0.000 Min. :0.0000

1st Qu.:0.0000 Class :character 1st Qu.:2.000 1st Qu.:0.0000

Median :0.0000 Mode :character Median :5.000 Median :1.0000

Mean :0.2248 Mean :4.903 Mean :0.5803

3rd Qu.:0.0000 3rd Qu.:7.000 3rd Qu.:1.0000

Max. :1.0000 Max. :9.000 Max. :1.0000

NA's :106 NA's :34 NA's :30

pneumo pda cld sex

Min. :0.0000 Min. :0.0000 Min. :0.0000 Length:671

1st Qu.:0.0000 1st Qu.:0.0000 1st Qu.:0.0000 Class :character

Median :0.0000 Median :0.0000 Median :0.0000 Mode :character

Mean :0.1969 Mean :0.2087 Mean :0.2694

3rd Qu.:0.0000 3rd Qu.:0.0000 3rd Qu.:1.0000

Max. :1.0000 Max. :1.0000 Max. :1.0000

NA's :26 NA's :29 NA's :66

dead

Min. :0.0000

1st Qu.:0.0000

Median :0.0000

Mean :0.2146

3rd Qu.:0.0000

Max. :1.0000

8.

g<-VLBWI %>% filter (race=="female") %>% summarise(VLBWI$race)

head(g)

g<-VLBWI %>% filter (race=="female") %>% summarise(VLBWI$race)

> head(g)

# A tibble: 6 × 1

`VLBWI$race`

<chr>

1 white

2 white

3 black

4 black

5 black

6 white

9.

summ\_lowph<- summary (VLBWI$lowph)

> head(summ\_lowph)

Min. 1st Qu. Median Mean 3rd Qu. Max.

6.529999 7.129997 7.209999 7.201903 7.309998 7.549999

10.

b<- select(VLBWI,c(2:20))

> head(b)

# A tibble: 6 × 19

hospstay lowph pltct race bwt gest inout twn lol magsulf meth toc deliv…¹ apg1

<dbl> <dbl> <dbl> <chr> <dbl> <dbl> <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <chr> <dbl>

1 34 NA 100 white 1250 35 born a… 0 NA NA 0 0 abdomi… 8

2 9 7.25 244 white 1370 32 born a… 0 NA NA 1 0 abdomi… 7

3 -2 7.06 114 black 620 23 born a… 0 NA NA 0 1 vaginal 1

4 40 7.25 182 black 1480 32 born a… 0 NA NA 1 0 vaginal 8

5 2 6.97 54 black 925 28 born a… 0 NA NA 0 0 abdomi… 5

6 62 7.19 NA white 940 28 born a… 0 NA NA 1 0 abdomi… 8

# … with 5 more variables: vent <dbl>, pneumo <dbl>, pda <dbl>, cld <dbl>, sex <chr>, and

# abbreviated variable name ¹​delivery

# ℹ Use `colnames()` to see all variable names

--------------------------------------------------------------------------------------------------------------------

11. b<- select(VLBWI,c(2:5))

> head(b)

# A tibble: 6 × 4

hospstay lowph pltct race

<dbl> <dbl> <dbl> <chr>

1 34 NA 100 white

2 9 7.25 244 white

3 -2 7.06 114 black

4 40 7.25 182 black

5 2 6.97 54 black

6 62 7.19 NA white

12

arrang1 <- arrange(VLBWI, desc(lowph), race)

> head(arrang1)

# A tibble: 6 × 21

patnum hospstay lowph pltct race bwt gest inout twn lol magsulf meth toc deliv…¹

<dbl> <dbl> <dbl> <dbl> <chr> <dbl> <dbl> <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <chr>

1 529 59 7.55 247 white 1480 34 born… 1 10 0 1 0 vaginal

2 530 31 7.52 272 white 1200 34 born… 1 10 0 1 0 vaginal

3 476 14 7.5 250 nativ… 1220 32 born… 0 10 0 1 0 vaginal

4 320 12 7.49 278 black 1500 34 born… 0 4 NA 0 0 vaginal

5 453 12 7.49 332 black 1400 33 born… 0 8 0 1 0 vaginal

6 264 32 7.48 356 black 1290 30 born… 0 NA 0 1 0 vaginal

# … with 7 more variables: apg1 <dbl>, vent <dbl>, pneumo <dbl>, pda <dbl>, cld <dbl>,

# sex <chr>, dead <dbl>, and abbreviated variable name ¹​delivery

# ℹ Use `colnames()` to see all variable names

------------------------------------------------------------------------------------------------------------------------------

13.

> a1<- select(VLBWI, lowph, race)

> arrang1 <- arrange(a1, desc(lowph), race)

> head(arrang1)

# A tibble: 6 × 2

lowph race

<dbl> <chr>

1 7.55 white

2 7.52 white

3 7.5 native american

4 7.49 black

5 7.49 black

6 7.48 black

---------------------------------------------------------------------------------------------------------------------------

14.

arrang1 <- arrange(a1, desc(lowph), race)

> head(arrang1)

# A tibble: 6 × 2

lowph race

<dbl> <chr>

1 7.55 white

2 7.52 white

3 7.5 native american

4 7.49 black

5 7.49 black

6 7.48 black

15.

> arrang1 <- arrange(a1, desc(lowph), race=="white")

> head(arrang1)

# A tibble: 6 × 2

lowph race

<dbl> <chr>

1 7.55 white

2 7.52 white

3 7.5 native american

4 7.49 black

5 7.49 black

6 7.48 black

16.

> arrang1 <- arrange(a1, desc(lowph) & race=="white")

> head(arrang1)

# A tibble: 6 × 2

lowph race

<dbl> <chr>

1 7.06 black

2 7.25 black

3 6.97 black

4 7.32 black

5 7.16 black

6 7.18 black

17.

> arrang1 <- arrange(a1, desc(lowph) & !race=="white")

> head(arrang1)

# A tibble: 6 × 2

lowph race

<dbl> <chr>

1 NA white

2 7.25 white

3 7.19 white

4 7.04 white

5 7.42 white

6 7.12 white

18.

select(VLBWI, race, lowph, pltct)

# A tibble: 671 × 3

race lowph pltct

<chr> <dbl> <dbl>

1 white NA 100

2 white 7.25 244

3 black 7.06 114

4 black 7.25 182

5 black 6.97 54

6 white 7.19 NA

7 black 7.32 282

8 NA NA NA

9 NA NA NA

10 black 7.16 153

# … with 661 more rows

# ℹ Use `print(n = ...)` to see more rows

19.

select(VLBWI, race:lowph)

# A tibble: 671 × 3

race pltct lowph

<chr> <dbl> <dbl>

1 white 100 NA

2 white 244 7.25

3 black 114 7.06

4 black 182 7.25

5 black 54 6.97

6 white NA 7.19

7 black 282 7.32

8 NA NA NA

9 NA NA NA

10 black 153 7.16

# … with 661 more rows

# ℹ Use `print(n = ...)` to see more rows

20

select(VLBWI, -race, lowph, pltct)

# A tibble: 671 × 20

patnum hospstay lowph pltct bwt gest inout twn lol magsulf meth toc deliv…¹ apg1

<dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <chr> <dbl>

1 1 34 NA 100 1250 35 born… 0 NA NA 0 0 abdomi… 8

2 2 9 7.25 244 1370 32 born… 0 NA NA 1 0 abdomi… 7

3 3 -2 7.06 114 620 23 born… 0 NA NA 0 1 vaginal 1

4 4 40 7.25 182 1480 32 born… 0 NA NA 1 0 vaginal 8

5 5 2 6.97 54 925 28 born… 0 NA NA 0 0 abdomi… 5

6 6 62 7.19 NA 940 28 born… 0 NA NA 1 0 abdomi… 8

7 7 32 7.32 282 1255 29.5 born… 0 NA NA 1 0 vaginal 9

8 8 NA NA NA 600 26 born… NA NA NA NA NA NA NA

9 9 NA NA NA 700 24 born… NA NA NA NA NA NA NA

10 10 28 7.16 153 1350 34 born… 0 NA NA 1 0 abdomi… 4

# … with 661 more rows, 6 more variables: vent <dbl>, pneumo <dbl>, pda <dbl>, cld <dbl>,

# sex <chr>, dead <dbl>, and abbreviated variable name ¹​delivery

# ℹ Use `print(n = ...)` to see more rows, and `colnames()` to see all variable names

---------------------------------------------------------------------------------------------

21.

Neg<- select(VLBWI, -race, lowph, pltct)

> dim(Neg)

[1] 671 20

> str(VLBWI)

tibble [671 × 21] (S3: tbl\_df/tbl/data.frame)

$ patnum : num [1:671] 1 2 3 4 5 6 7 8 9 10 ...

$ hospstay: num [1:671] 34 9 -2 40 2 62 32 NA NA 28 ...

$ lowph : num [1:671] NA 7.25 7.06 7.25 6.97 ...

$ pltct : num [1:671] 100 244 114 182 54 NA 282 NA NA 153 ...

$ race : chr [1:671] "white" "white" "black" "black" ...

$ bwt : num [1:671] 1250 1370 620 1480 925 ...

$ gest : num [1:671] 35 32 23 32 28 28 29.5 26 24 34 ...

$ inout : chr [1:671] "born at duke" "born at duke" "born at duke" "born at duke" ...

$ twn : num [1:671] 0 0 0 0 0 0 0 NA NA 0 ...

$ lol : num [1:671] NA NA NA NA NA NA NA NA NA NA ...

$ magsulf : num [1:671] NA NA NA NA NA NA NA NA NA NA ...

$ meth : num [1:671] 0 1 0 1 0 1 1 NA NA 1 ...

$ toc : num [1:671] 0 0 1 0 0 0 0 NA NA 0 ...

$ delivery: chr [1:671] "abdominal" "abdominal" "vaginal" "vaginal" ...

$ apg1 : num [1:671] 8 7 1 8 5 8 9 NA NA 4 ...

$ vent : num [1:671] 0 0 1 0 1 1 0 NA NA 0 ...

$ pneumo : num [1:671] 0 0 0 0 1 0 0 NA NA 0 ...

$ pda : num [1:671] 0 0 0 0 0 0 0 NA NA 0 ...

$ cld : num [1:671] 0 0 NA 0 0 0 0 NA NA 0 ...

$ sex : chr [1:671] "female" "female" "female" "male" ...

$ dead : num [1:671] 0 0 1 0 1 0 0 1 1 0 ...

22. select(select\_sex, 1:4)

# A tibble: 320 × 4

patnum hospstay lowph pltct

<dbl> <dbl> <dbl> <dbl>

1 1 34 NA 100

2 2 9 7.25 244

3 3 -2 7.06 114

4 5 2 6.97 54

5 6 62 7.19 NA

6 7 32 7.32 282

7 10 28 7.16 153

8 15 1 7.12 378

9 18 50 7.27 NA

10 21 44 7.29 134

# … with 310 more rows

# ℹ Use `print(n = ...)` to see more rows

------------------------------------------------------------------------------------------------------------

> select(select\_sex, 1:14)

# A tibble: 320 × 14

patnum hospstay lowph pltct race bwt gest inout twn lol magsulf meth toc deliv…¹

<dbl> <dbl> <dbl> <dbl> <chr> <dbl> <dbl> <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <chr>

1 1 34 NA 100 white 1250 35 born… 0 NA NA 0 0 abdomi…

2 2 9 7.25 244 white 1370 32 born… 0 NA NA 1 0 abdomi…

3 3 -2 7.06 114 black 620 23 born… 0 NA NA 0 1 vaginal

4 5 2 6.97 54 black 925 28 born… 0 NA NA 0 0 abdomi…

5 6 62 7.19 NA white 940 28 born… 0 NA NA 1 0 abdomi…

6 7 32 7.32 282 black 1255 29.5 born… 0 NA NA 1 0 vaginal

7 10 28 7.16 153 black 1350 34 born… 0 NA NA 1 0 abdomi…

8 15 1 7.12 378 white 970 28 born… 0 NA NA 1 1 vaginal

9 18 50 7.27 NA black 1170 31 born… 1 NA NA 1 0 vaginal

10 21 44 7.29 134 white 1000 28 born… 0 NA NA 0 0 vaginal

# … with 310 more rows, and abbreviated variable name ¹​delivery

# ℹ Use `print(n = ...)` to see more rows

23.

FL <- VLBWI %>%

+ select(race, sex) %>%

+ filter(race=="white", sex == "female")

> table(FL)

sex

race female

white 133

--------------------------------------------------------------------------------------------