Class 17: Essential UNIX for Bioinformatics

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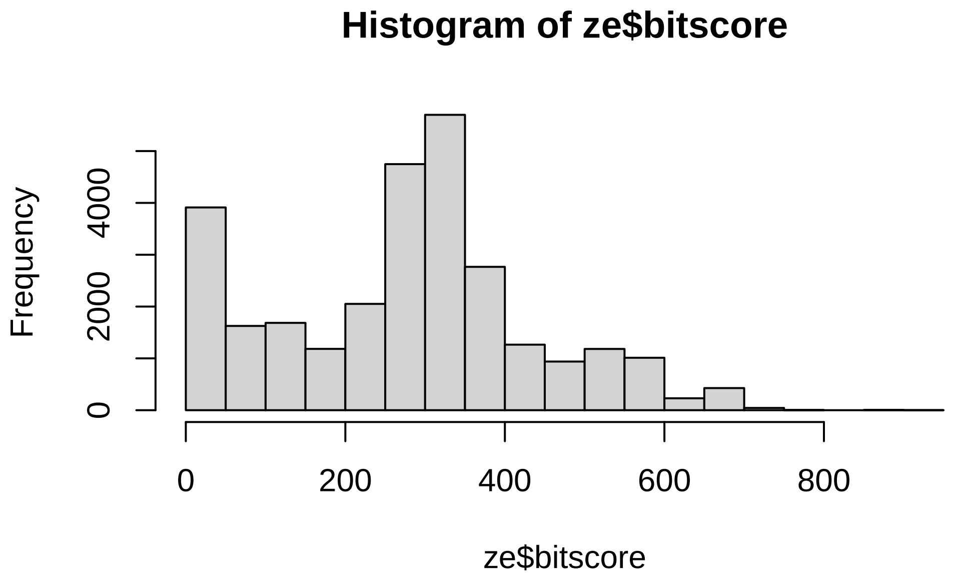
```
ze <- read.delim("mm-second.x.zebrafish.tsv")

colnames(ze) <- c("qseqid", "sseqid", "pident", "length", "mismatch", "gapopen", "qstart",

head(ze)
```

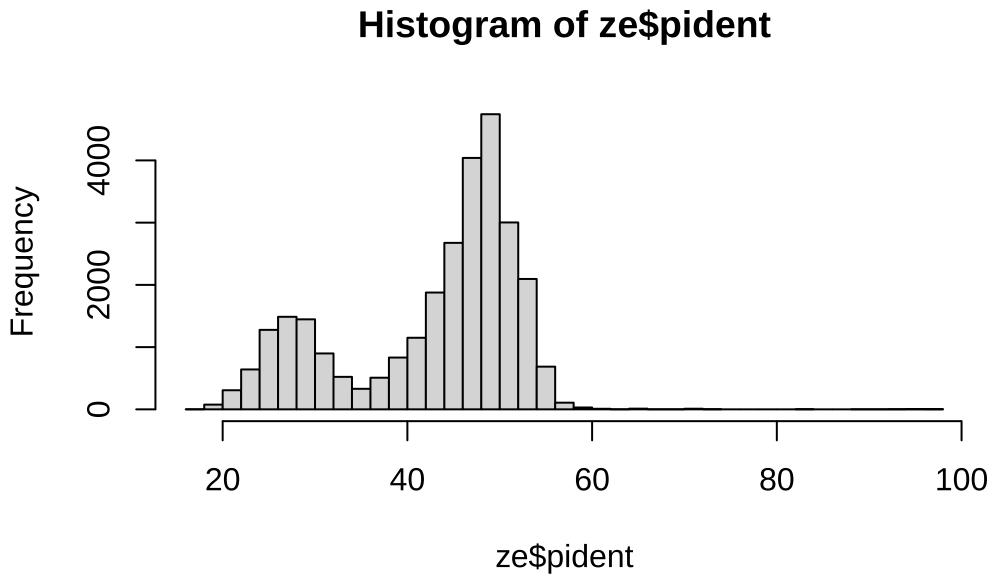
```
       qseqid         sseqid pident length mismatch gapopen qstart qend sstart
1 NP_598866.1 NP_001313634.1 46.154    273      130       6      4  267    476
2 NP_598866.1 XP_009294513.1 46.154    273      130       6      4  267    475
3 NP_598866.1 NP_001186666.1 33.071    127       76       5      4  126    338
4 NP_598866.1 NP_001003517.1 30.400    125       82       4      4  126    344
5 NP_598866.1 NP_001003517.1 30.645     62       41       2     53  113     43
6 NP_598866.1    NP_956073.2 34.444     90       56       3     40  126    527
  send   evalue bitscore
1  740 4.51e-63    214.0
2  739 4.69e-63    214.0
3  459 5.19e-12     67.8
4  465 2.67e-11     65.5
5  103 4.40e-01     33.9
6  616 1.70e-10     63.2
```

Let's make a histogram of `$bitscore` values.

```
hist(ze$bitscore, breaks=30)
```

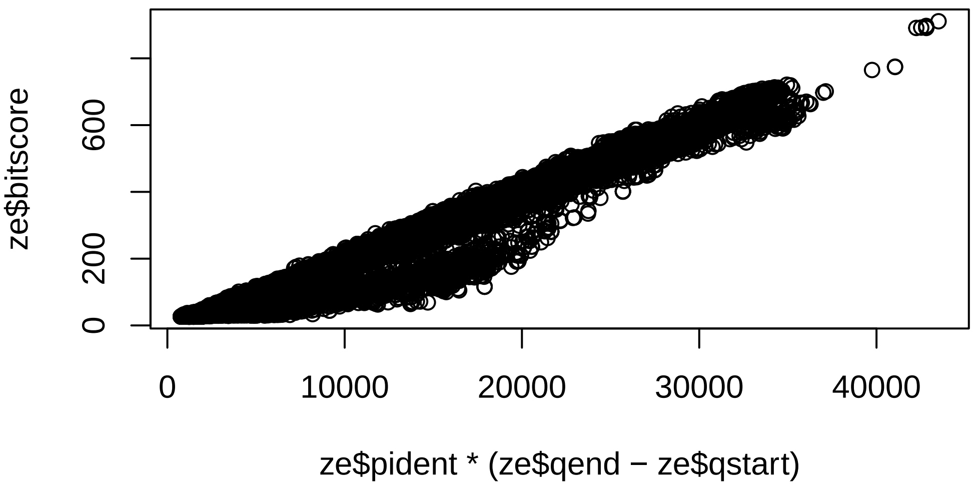


```r
hist(ze$pident, breaks=30)
```



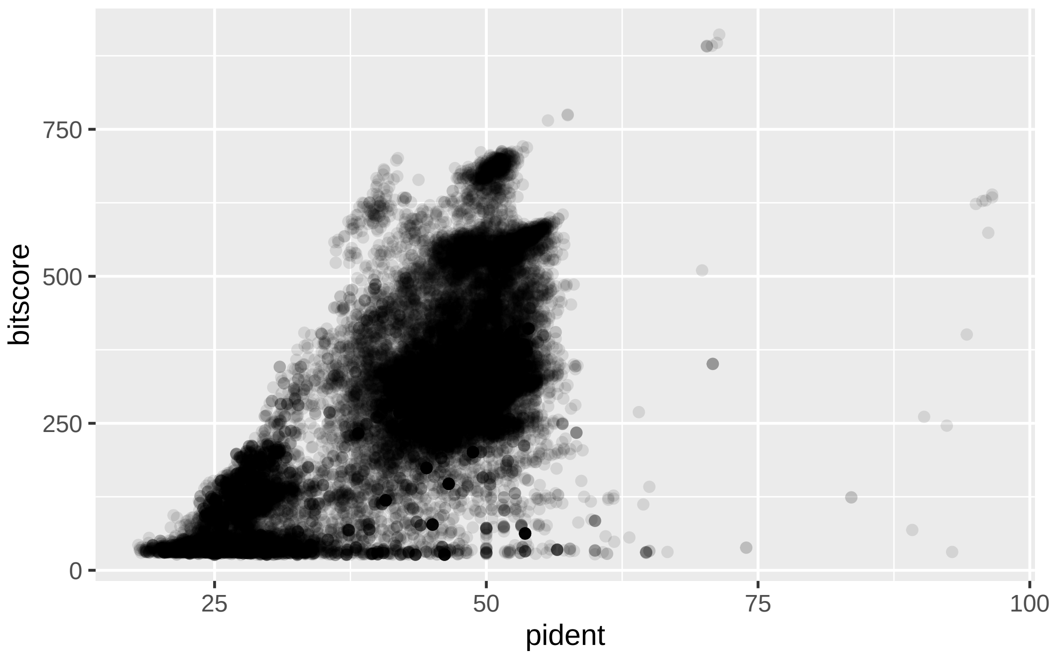
Bitscores are only somewhat related to pident; they take into account not only the percent identity but the length of the alignment. You can get a napkin sketch estimate of this by doing the following:

```
## Asuming your blast results are stored in an object called 'ze'
plot(ze$pident  * (ze$qend - ze$qstart), ze$bitscore)
```



Let's use ggplot instead.

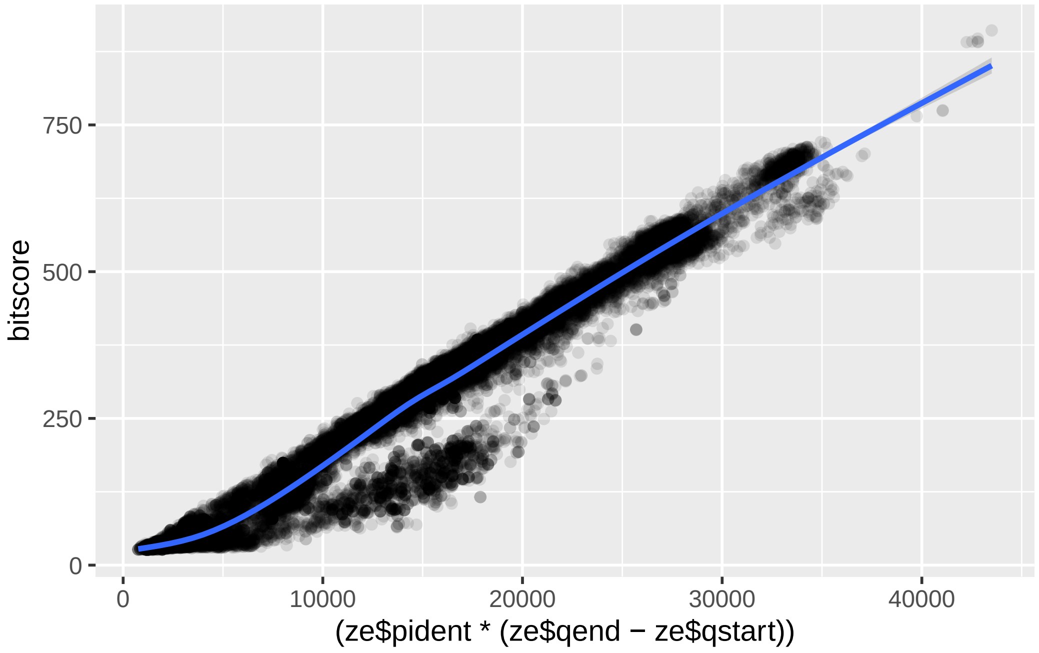
```
library(ggplot2)

ggplot(ze, aes(pident, bitscore)) +
  geom_point(alpha=0.1)
```



```
ggplot(ze, aes((ze$pident * (ze$qend - ze$qstart)), bitscore)) +
  geom_point(alpha=0.1) +
  geom_smooth()
```

```
Warning: Use of `ze$pident` is discouraged.
i Use `pident` instead.

Warning: Use of `ze$qend` is discouraged.
i Use `qend` instead.

Warning: Use of `ze$qstart` is discouraged.
i Use `qstart` instead.

Warning: Use of `ze$pident` is discouraged.
i Use `pident` instead.

Warning: Use of `ze$qend` is discouraged.
i Use `qend` instead.

Warning: Use of `ze$qstart` is discouraged.
i Use `qstart` instead.
```

```
`geom_smooth()` using method = 'gam' and formula = 'y ~ s(x, bs = "cs")'
```


bitscore
(ze$pident * (ze$qend − ze$qstart))