

(A) General Feature Format - GFF

- Begins with a set of meta-information header lines
- Divided into 9 fixed columns (including *start* and *end*)
- The last column may include any number of row-specific attributes, *i.e.* tag=value pairs
- Currently in version 3

```
##gff-version 3
##sequence-region ctg123 1 1497228
ctg123 . gene 1000 9000 . + . ID=gene00001;Name=EDEN
ctg123 . mRNA 1050 7000 . + . ID=mRNA00001;Name=EDEN.1;Parent=gene00001
ctg123 . mRNA 1300 7000 . + . ID=mRNA00002;Name=EDEN.2;Parent=gene00001
ctg123 . exon 1300 1500 . + . ID=exon00001;Parent=mRNA00002
ctg123 . exon 3000 3902 . + . ID=exon00002;Parent=mRNA00001, mRNA00002
ctg123 . exon 5000 7000 . + . ID=exon00003;Parent=mRNA00001, mRNA00002
ctg123 . CDS 1201 1500 . + 0 ID=cds00001;Name=edenprotein.1;Parent=mRNA00001
ctg123 . CDS 3000 3902 . + 0 ID=cds00001;Name=edenprotein.1;Parent=mRNA00001
ctg123 . CDS 5000 5500 . + 0 ID=cds00003;Name=edenprotein.2;Parent=mRNA00002
ctg123 . CDS 5000 5500 . + 1 ID=cds00003;Name=edenprotein.2;Parent=mRNA00002
ctg123 . CDS 3391 3902 . + 0 ID=cds00004;Name=edenprotein.3;Parent=mRNA00002
ctg123 . CDS 5000 5500 . + 1 ID=cds00004;Name=edenprotein.3;Parent=mRNA00002
```

(B) Browser Extensible Data - BED

- Divided into 12 fixed columns, 3 of which are required (including *start* and *end*)
- Contains positional information of blocks (subsegments), *e.g.* exons of genes

```
chr22 1000 5000 cloneA 960 + 1000 5000 0 2 567,488, 0,3512
chr22 2000 6000 cloneB 900 - 2000 6000 0 2 433,399, 0,3601
```

(C) Wiggle Track Format - WIG

- Each block of data starts with a declaration line. Two types: *variableStep* for irregular and *fixedStep* for regular positioning of track elements
- *Span* attribute defines the length of each track element
- *Step* defines the distance between starts of each element (*fixedStep* only)
- Two columns for *variableStep* (*start* and *value*), one for *fixedStep* (*value*)

```
variableStep chrom=chr1      fixedStep chrom=chr1 start=201 step=100 span=100
201 25.0                      25.0
301 26.0                      26.0
351 25.0                      25.0
476 23.0                      23.0
variableStep chrom=chr2      fixedStep chrom=chr2 start=151 step=100 span=100
151 10.0                      10.0
251 11.0                      11.0
376 13.0                      13.0
501 14.0                      14.0
```