

# Objects in DNA analysis

Nasser M. Abbasi

sometime in 1997

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This is a description of objects used in DNA/Genomics software development. I need to first come up with such a list, and the relationship between them to base any further software development of a sw library.

Each object is described and listing of what other objects it contains and what attributes the objects has.

Each object will be represented as a class. The object attributes will help to define the access methods of the object.

## 1. Chromosome.

contains: contig objects. one DNA Molecule

Attributes:

- (a) Enochromatic size, in kb.
- (b) number of contigs it contains.
- (c) number of bases.
- (d) Name or ID of chromosom (1, 2, ... Y, X).

## 2. contig.

contains: physical position object, cytogenetic position object.

Attributes:

- (a) Name or ID. such as NT\_00039
- (b) size (in kb in bases)

## 3. physical position of contig in the chromosom.

Attributes (these are estimates from RH map positions):

- (a) start position. number
- (b) end position. number

## 4. Cytogenetic position of contig in the chromosom.

Attributes (based on annotation from GenBank entry)

- (a) start id. such as 1p34.3
- (b) end id. such as p36.13

## 5. DNA molecule (or DNA sequence)

contains number of Gene objects, contains one sequence of DNA base pairs objects.

- (a) number of genes.
- (b) number of base pairs.

## 6. Gene

contains number of exons and number of introns.

- (a) number of exons.
- (b) number of introns.

## 7. exon. a region in a gene that is a coding region for protein. Contains number of codons, and a DNA sequence.

- (a) size in bases.
- (b) number of codons.
- (c) start position in gene
- (d) end position in gene.

## 8. intron. a region in a gene that is a not a coding region for protein. Contains a DNA sequence

- (a) size in bases.
- (b) start position in gene
- (c) end position in gene.