

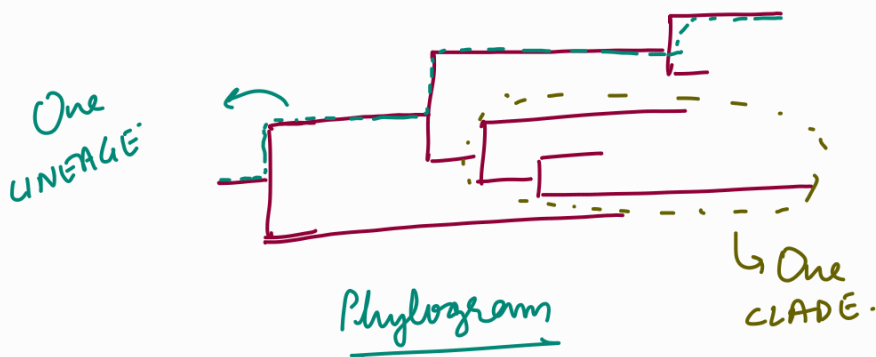
→ Manhattan Tourist Problem

↳ Very closely related to longest subsequence problem.

↳ Maximum no. of tourist places that can be visited in one visit from one end of city to another.

Next assignment:
How to construct tree of life.
(See)

Tree of Life \equiv Phylogenetic tree.



Differences in length show how similar or how different species are from its ancestor.

→ Cladogram: Relative common ancestor.

→ Phylogram: Branch length

→ Ultrametric: Shows when a particular species emerged.

DP.
Clustering
↓
DENDROGRAM

→ Found a new species.

↓
Identify posⁿ of it in phylogenetic tree.

↓
Sequencing to figure out mutations etc.

Mapping A, T, G, C, U → Nucleotides
of an organism

Genome: The entire ^{genetic} composition

Now could be Time.
★ For quiz
Q. Tree of life
★★★★
Length. Time.

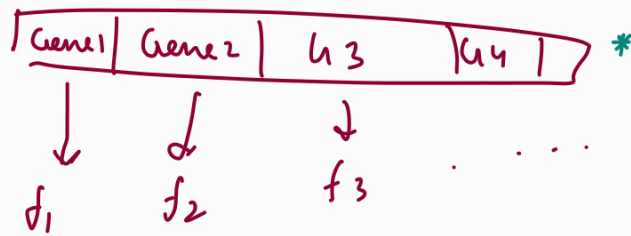
The genome size has increased over time from bacteria to homo sapiens.

$$10^6 \longrightarrow 10^9$$

A lot of funcⁿ got added.

→ Replicating & mutating
(Copying).

• Gene : Segments of DNA.



* Genes are not packed together.

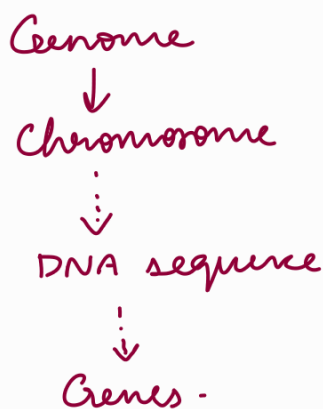
A lot of part of DNA hasn't been identified what it does.

"Junk" DNA

"Coding potential of DNA".

Combinatorial control .. Combination of genes controls a certain function -

→ Genomes are organised as chromosomes.



Human genome.

GENOME 10k.

Project

The Human Genome



Complementary base pairing.



Antiparallel



Read what 3' 4
5' are.

See structure of
nucleotides.

→ Why antiparallel? Why double stranded?

→ RNA → Single strand.

So why double stranded.

Nucleotide = Phosphate + ^(5 carbon)sugar + Base.

DNA : Deoxy ribose

The phosphate - sugar are joined along the axis.

→ Sequence

↓
(Structure) (3D)
↓
Function

→ DNA is coiled
in histone.



Histones.
(Protein).
↑ 8 unit
Octamer

→ The double helical structure
is coiled in some 3D structure.

→ "Bead" on string
↳ Nucleosome.

*** Quiz
Dimension of
cell, nuclei.

Defⁿ of
Euchromatin.

- Centromere: Place where sister chromatids are joined
 - Telomere: Ends of DNA in a chromosome
- Cell division:

Heterochromatin
Centromere
Telomere

Interphase → M-phase.

Extended
structure

Compact

Cytogenetics

- Telomere doesn't contribute anything in cell func.
- The compact parts are distributed non-uniformly in the chromosome.

→ Cytogenetics: Visual morphology of chromosome

Down's syndrome → Extra chromosome

→ Why 23?

Diff organisms have diff. no. of chromosomes

- Can 2 organisms have the same DNA sequence but diff. no. of chromosomes? YES!

Eg, Chinese muntjac & Indian muntjac.

↓
Has XY, Y₂ sex chromosome.