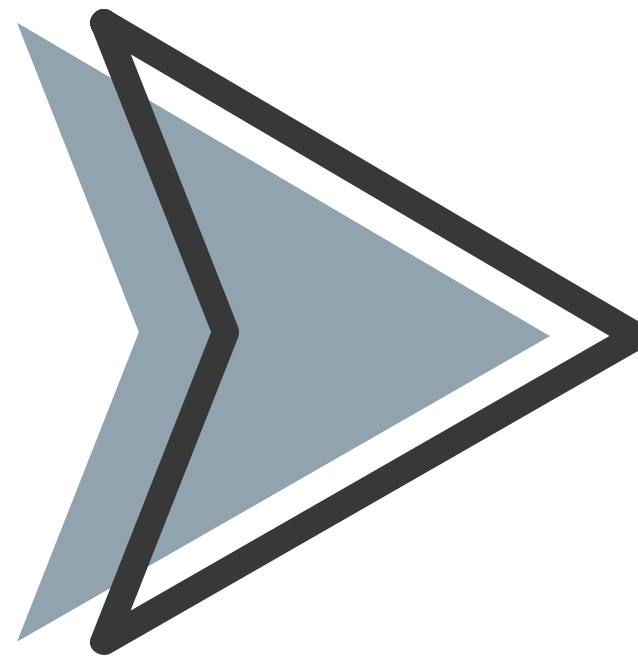




Marky Coco



marky coco 2

Comprehensive Tool
for Mercury Genes
Detection



-
-
- Automatic validation of hgcA and hgcB
- Automatic validation of merA and merB
- Generation of merA and merB for MAGs, SAGs, and isolates
- Taxonomic assignment of the genes
- Automatic gene coverage normalization with different normalization techniques
-
-
-

Marky
Coco2

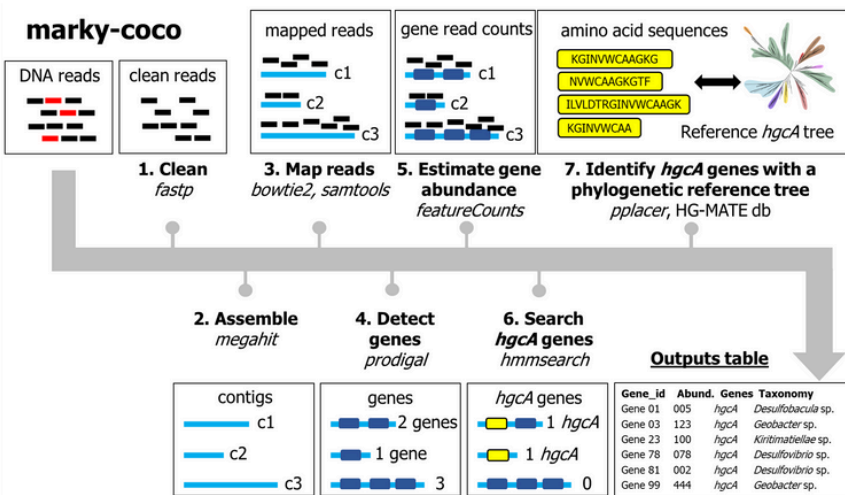


Marky
Coco2
alpha

-
-
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-
-
-

Marky Coco² alpha

Marky Coco



Conversion to Python

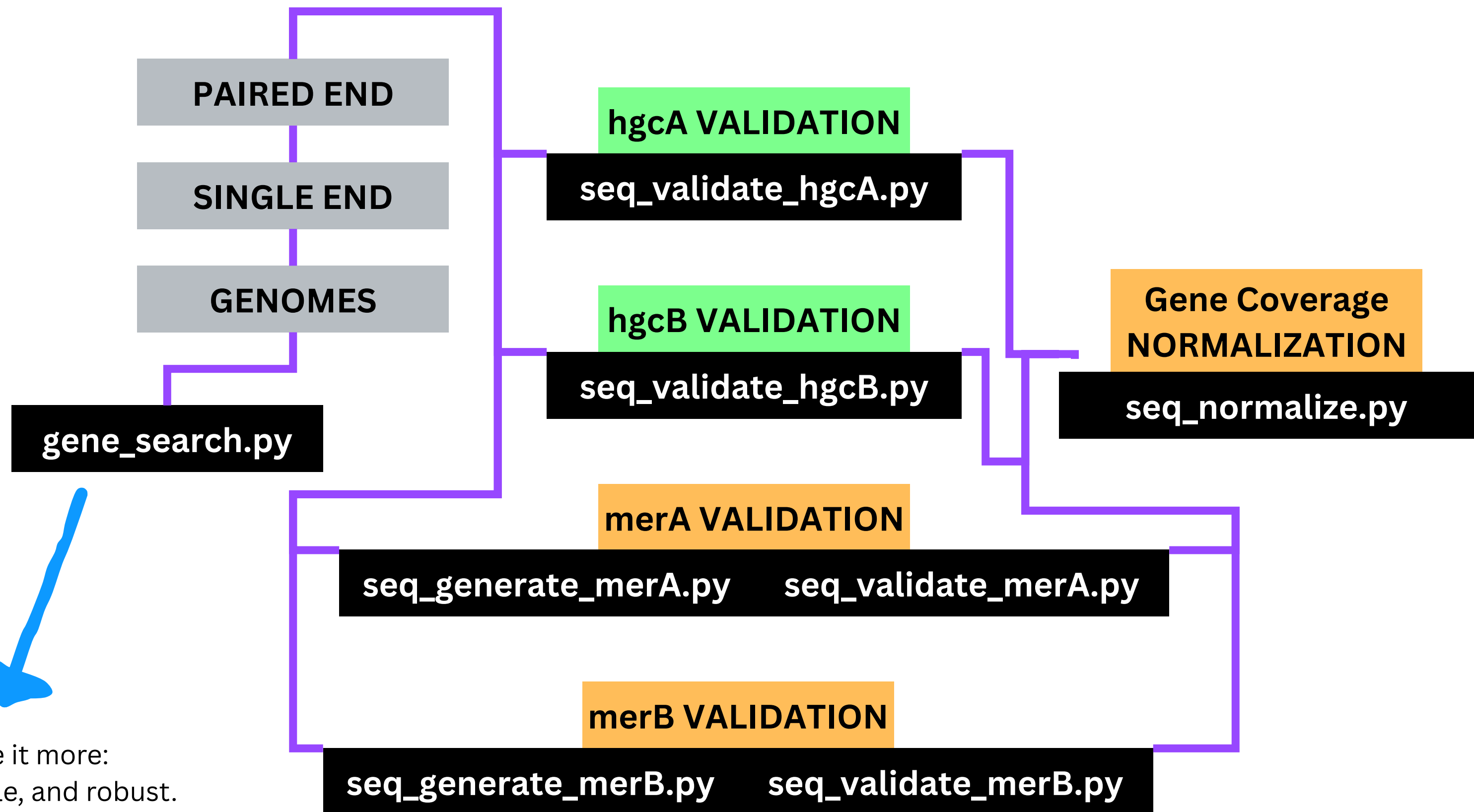
Python will make it more:
maintainable, readable, and robust.

It would eliminate:

temporary files

long chains of awk/sed/grep.

repetition of large blocks of code



GENOMES

PAIRED END

SINGLE END

merA and merB validation

- Generation of merA and merB:
for each BIN it run **hmmsearch** and **esl-reformat** to produce one table and one FASTA file for merA and merB



- Validation of merA and merB

merA validation

*merA: Bacillus sp. RC607

merB: Escherichia coli plasmid R831b

multi-step validation

BLASTP

MUSCLE

SCORE TABLE

>30% AA sequence similarity

alignment with reference*

score based on the presence of specific AAs

Tabular file

high-confidence
merA sequences

seq_id | length | read | cov | contig | sequence | gene_type

Number of Sequences

The score table

The following MerA sequence signatures have been experimentally shown to be essential for MerA activity (Barkay et al., 2003):

- the conserved cysteine pair at positions 207 and 212
- the vicinal cysteine pair at the carboxy terminus (positions 628 and 629),
- tyrosine at position 264 (Rennex et al., 1993)

C207	C212	C628	C629	Y264
1	1	1	1	1

0 to 5 points

Aligned MerB homologs were examined for the presence of the following sequence signatures:

- cysteine at position 96 (numbering in reference to MerB from R831b)
- aspartic acid at position 99,
- and cysteines at position 159 and 117

Following Pitts and Summers, 2002 and Lafrance-Vanasse et al., 2009.

D99	C159	C117	C96
1	1	1	1

0 to 4 points

The score table

DIFFERENT
THRESHOLD

=

DIFFERENT
NUMBER OF
SEQUENCES

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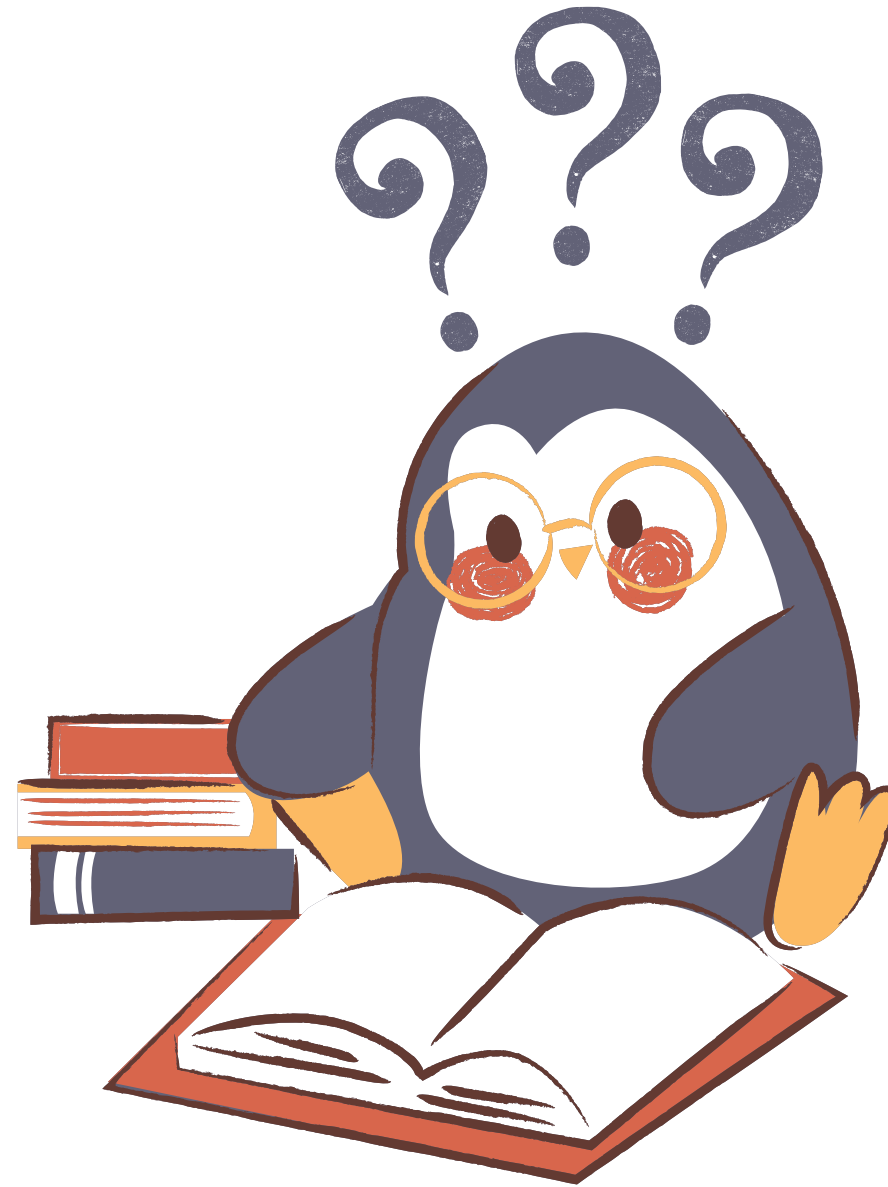
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1	1	1	1

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Hands On

Questions





Thank You
For Your Attention