Overview of ICAMS R package functionalities

Strelka SBS VCF

Strelka ID VCF

Mutect VCF

Read in variant call files (VCFs)

Collate the mutations into "catalogs" of mutational spectra

SBS Catalog: 96, 192, 1536

DBS Catalog: 78, 144, 136

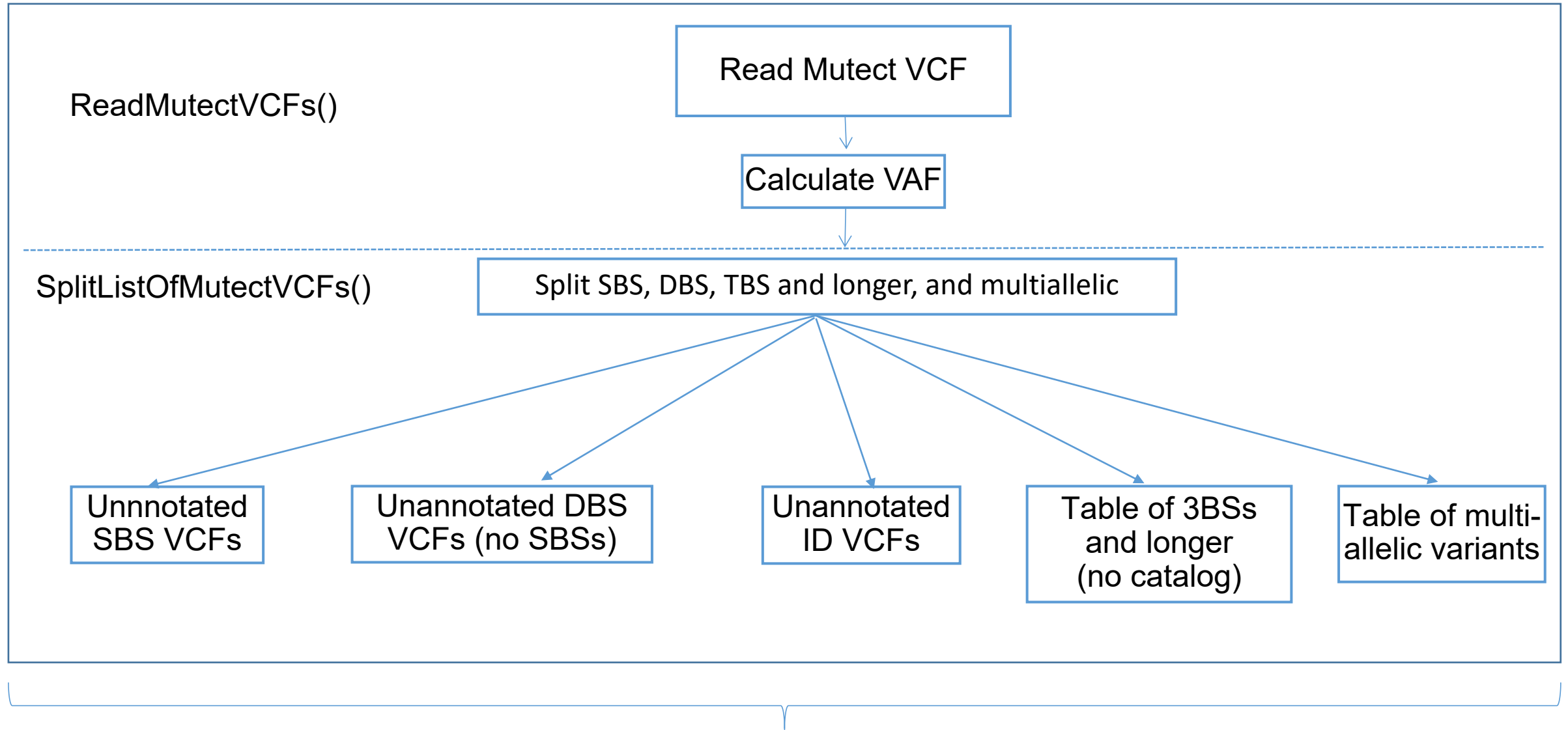Indel Catalog

Transform and plot catalogs of mutational spectra or signatures

density catalog

counts catalog

counts signature catalog

density signature catalog

Write catalogs of mutational spectra or signatures to a file

*SBS 192 and DBS 144 catalogs only include mutations in transcribed regions

Strelka VCF processing
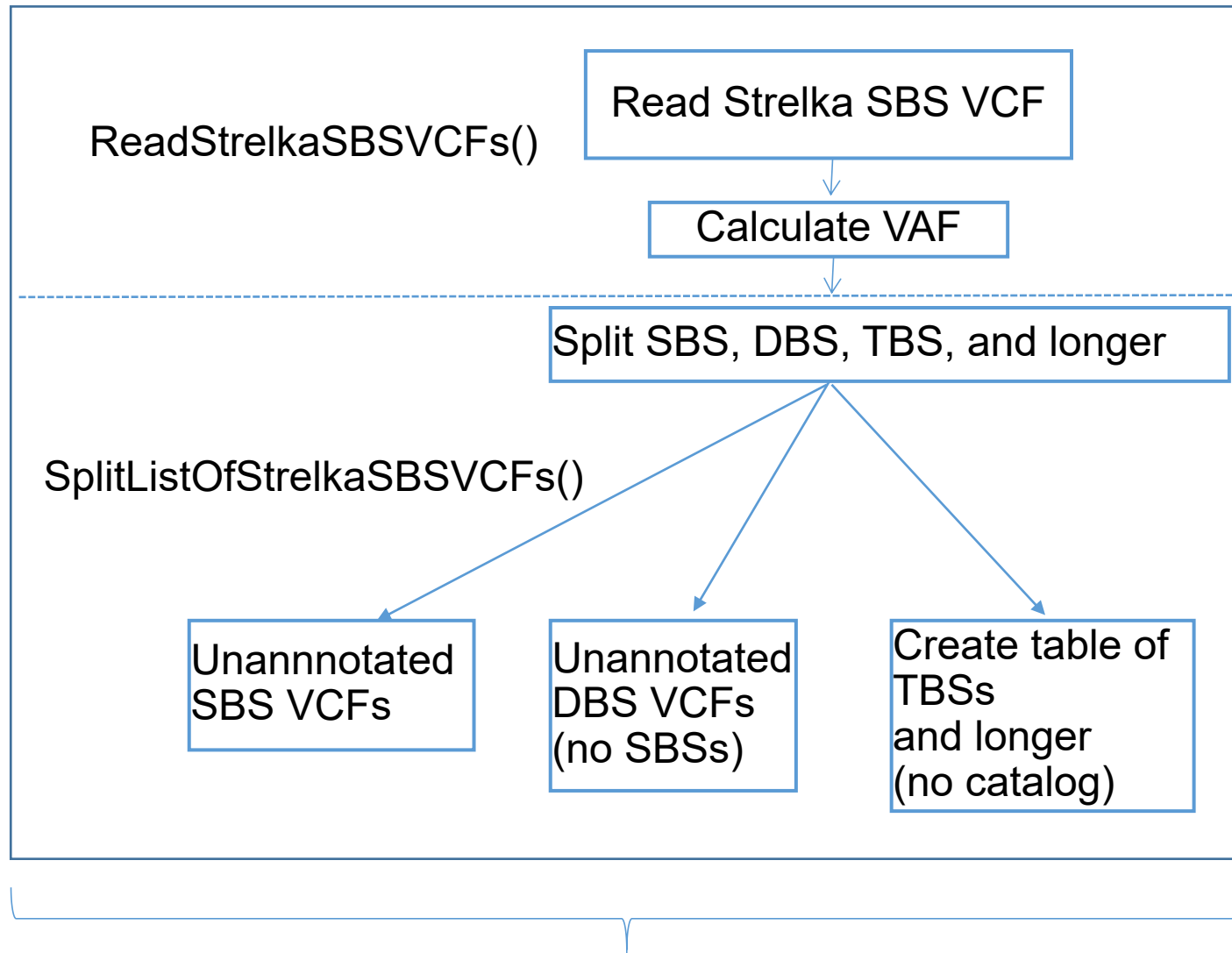
Mutect VCF processing

ReadMutectVCFs()

Read Mutect VCF

Calculate VAF

SplitListOfMutectVCFs()

Split SBS, DBS, TBS and longer, and multiallelic

Unnnotated SBS VCFs

Unannotated DBS VCFs (no SBSs)

Unannotated ID VCFs

Table of 3BSs and longer (no catalog)

Table of multi-allelic variants
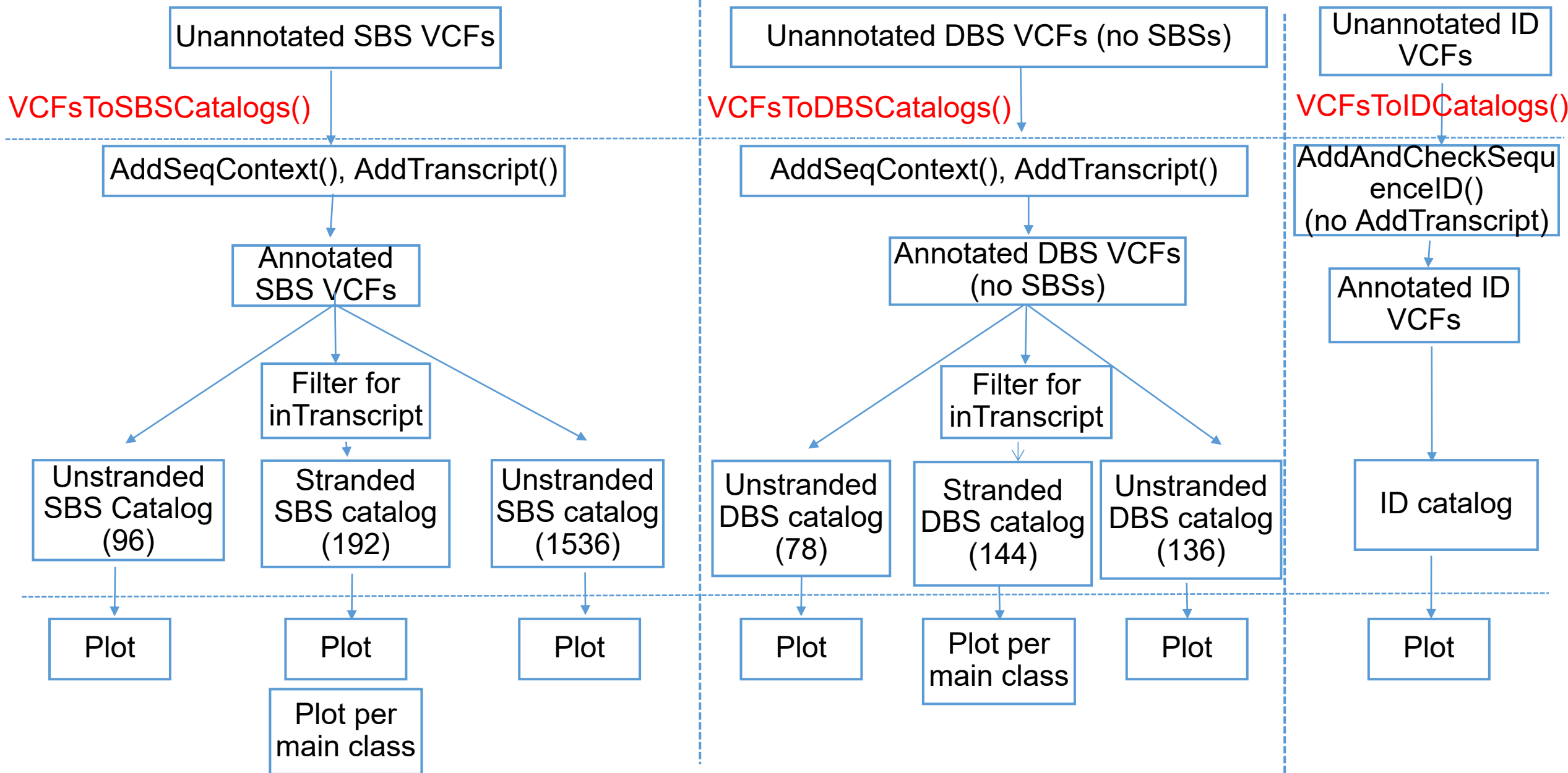
ReadAndSplitMutectVCFs()

* Functions whose names in red color are exported in ICAMS

VCFs to catalogs and beyond

Unannotated SBS VCFs

Unannotated DBS VCFs (no SBSs)

Unannotated ID VCFs

VCFsToSBSCatalogs()

VCFsToDBSCatalogs()

VCFsToIDCatalogs()

AddSeqContext(), AddTranscript()

AddSeqContext(), AddTranscript()

AddAndCheckSequenceID()
(no AddTranscript)

Annotated SBS VCFs

Annotated DBS VCFs (no SBSs)

Annotated ID VCFs

Filter for inTranscript

Filter for inTranscript

Unstranded SBS Catalog (96)

Stranded SBS catalog (192)

Unstranded SBS catalog (1536)

Unstranded DBS catalog (78)

Stranded DBS catalog (144)

Unstranded DBS catalog (136)

ID catalog

Plot

Plot

Plot

Plot

Plot per main class

Plot

Plot

Plot per main class

* Functions whose names in red color are exported in ICAMS

Important exported functions in ICAMS

INPUT x

FUNCTION f:

OUTPUT f(x)

https://howtoprogramwithjava.com/functions-in-javascript/
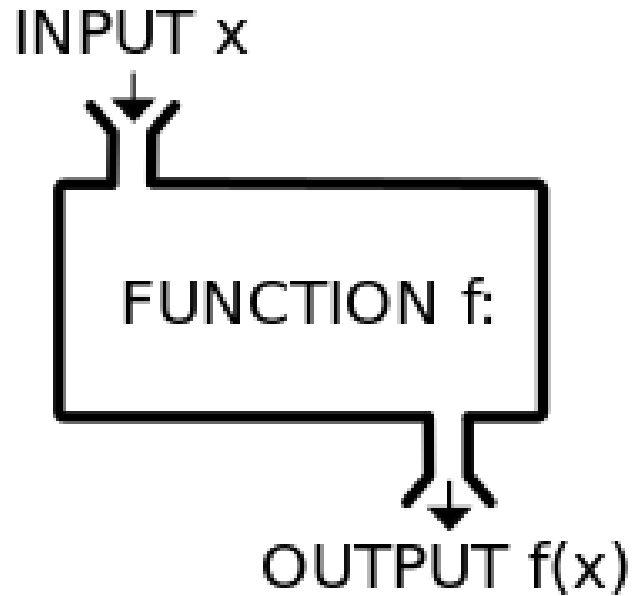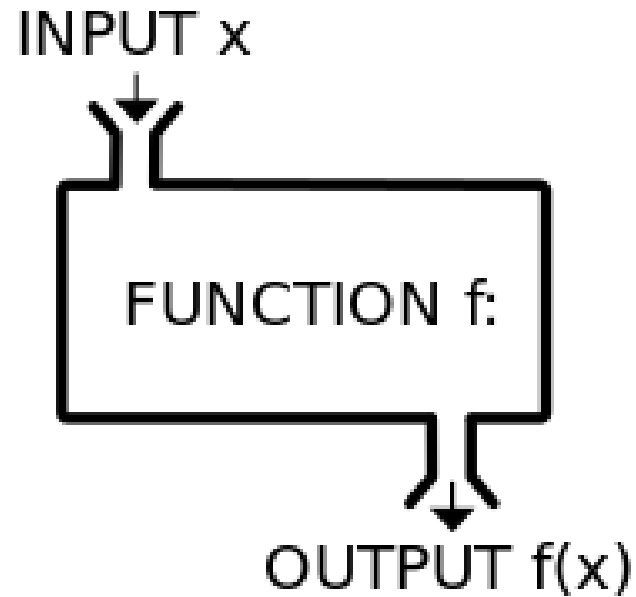
Creating catalogs from variant call files (VCF files)

- StrelkaSBSVCFFilesToCatalog()

- StrelkaIDVCFFilesToCatalog()

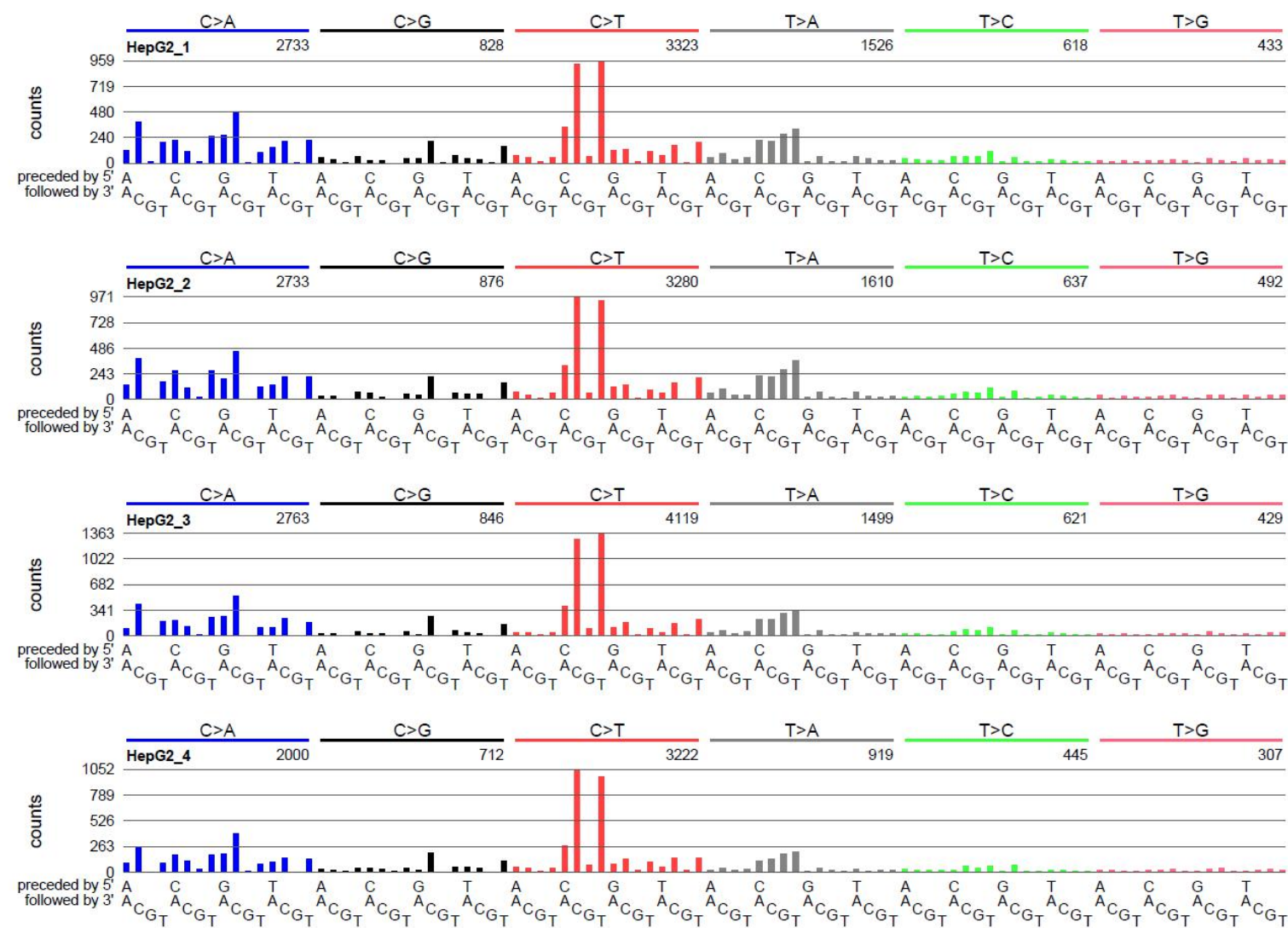- MutectVCFFilesToCatalog()

Important exported functions in ICAMS

INPUT x

FUNCTION f:

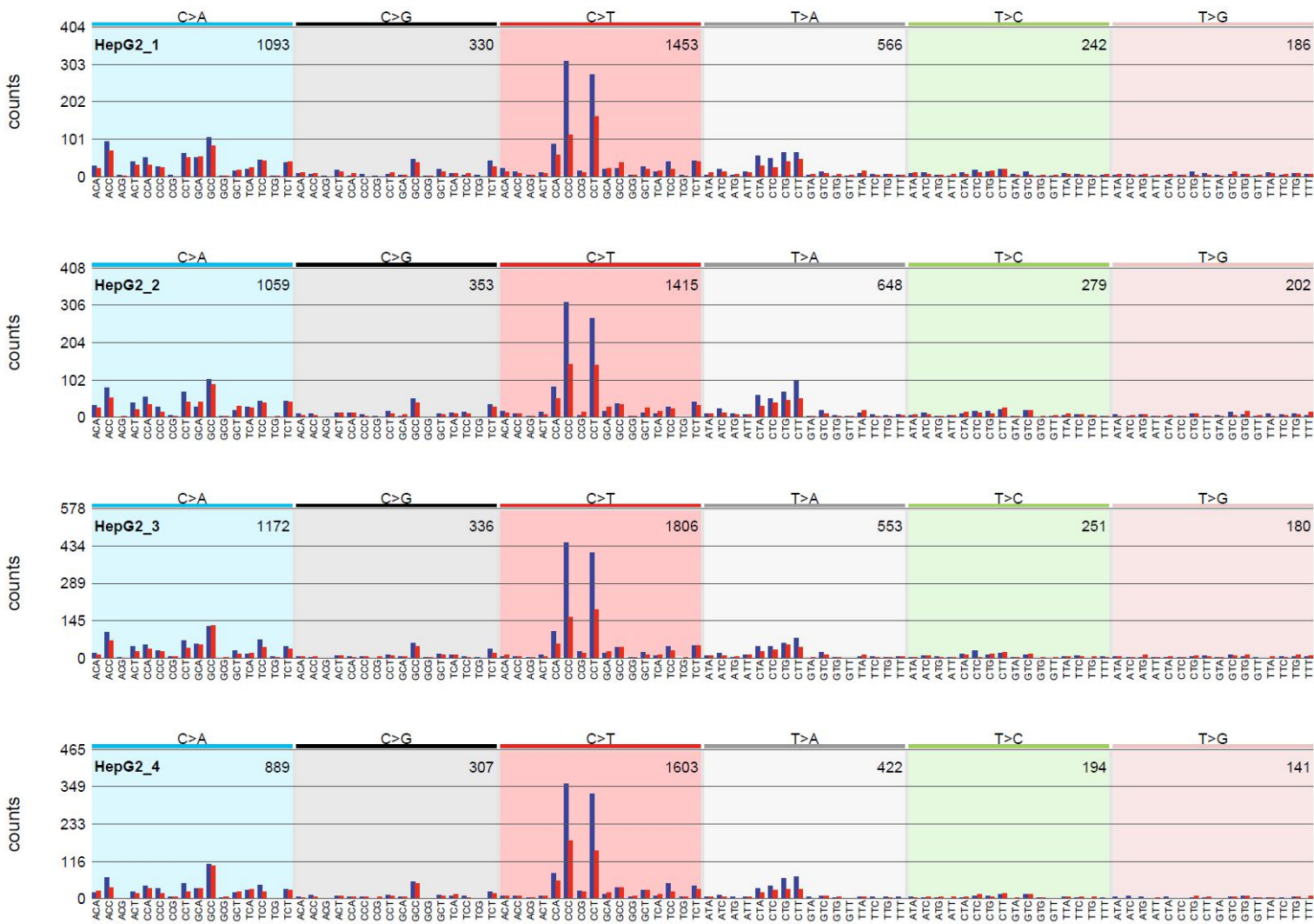OUTPUT f(x)

Plotting catalogs

- PlotCatalog()

- PlotCatalogToPdf()

https://howtoprogramwithjava.com/functions-in-javascript/
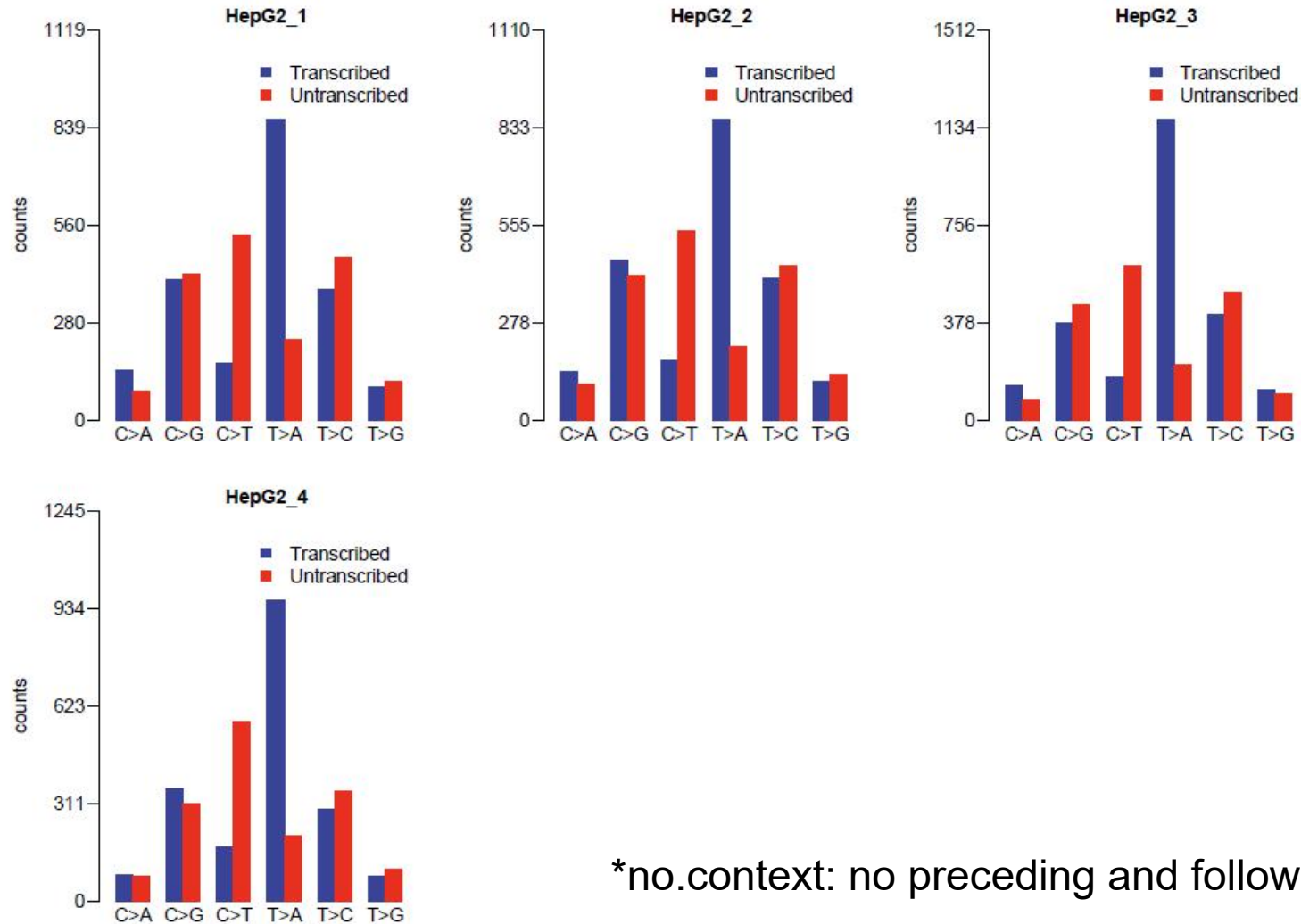
PlotCatalogToPdf(): SBS96 Catalog
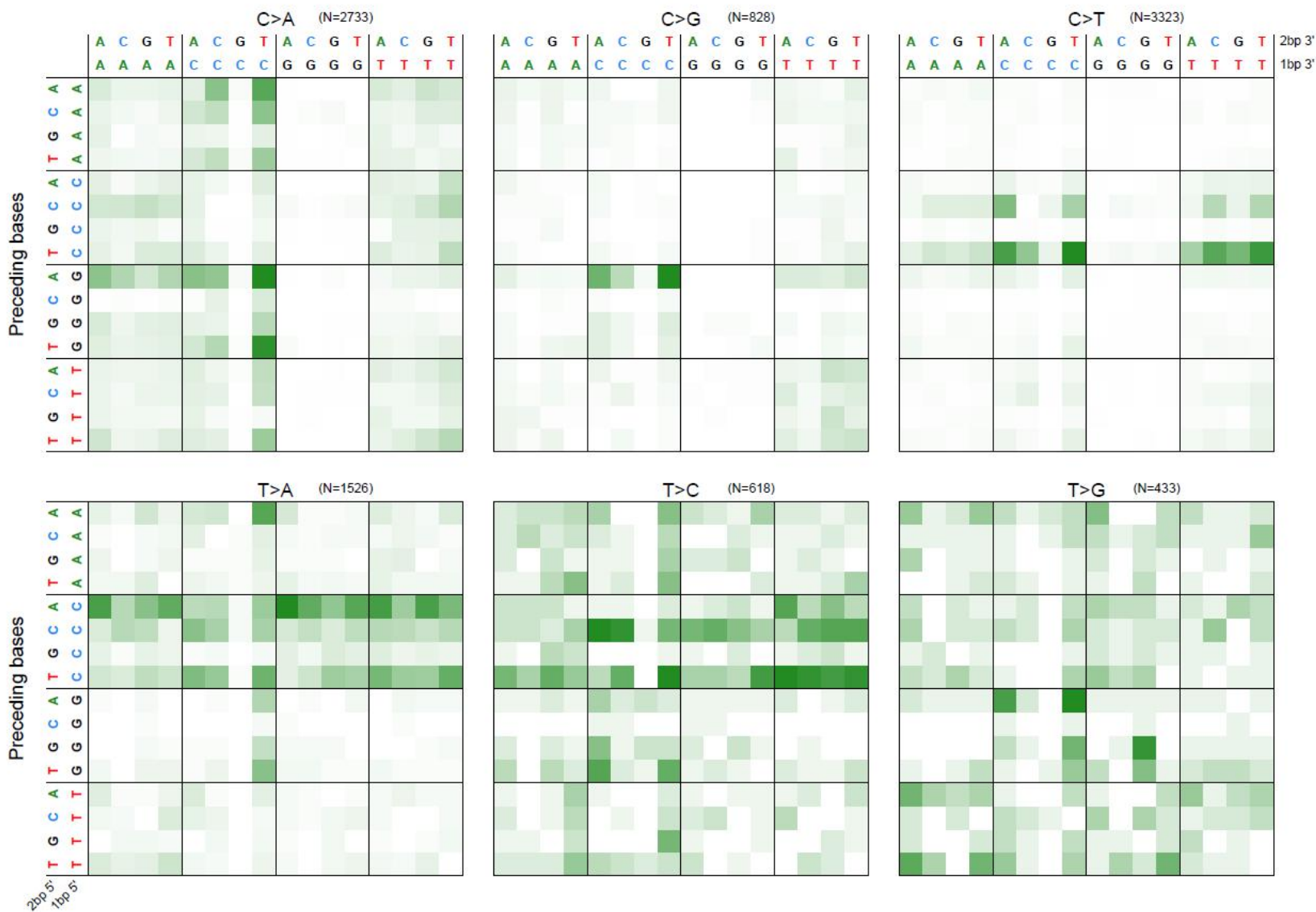
PlotCatalogToPdf(): SBS192 Catalog
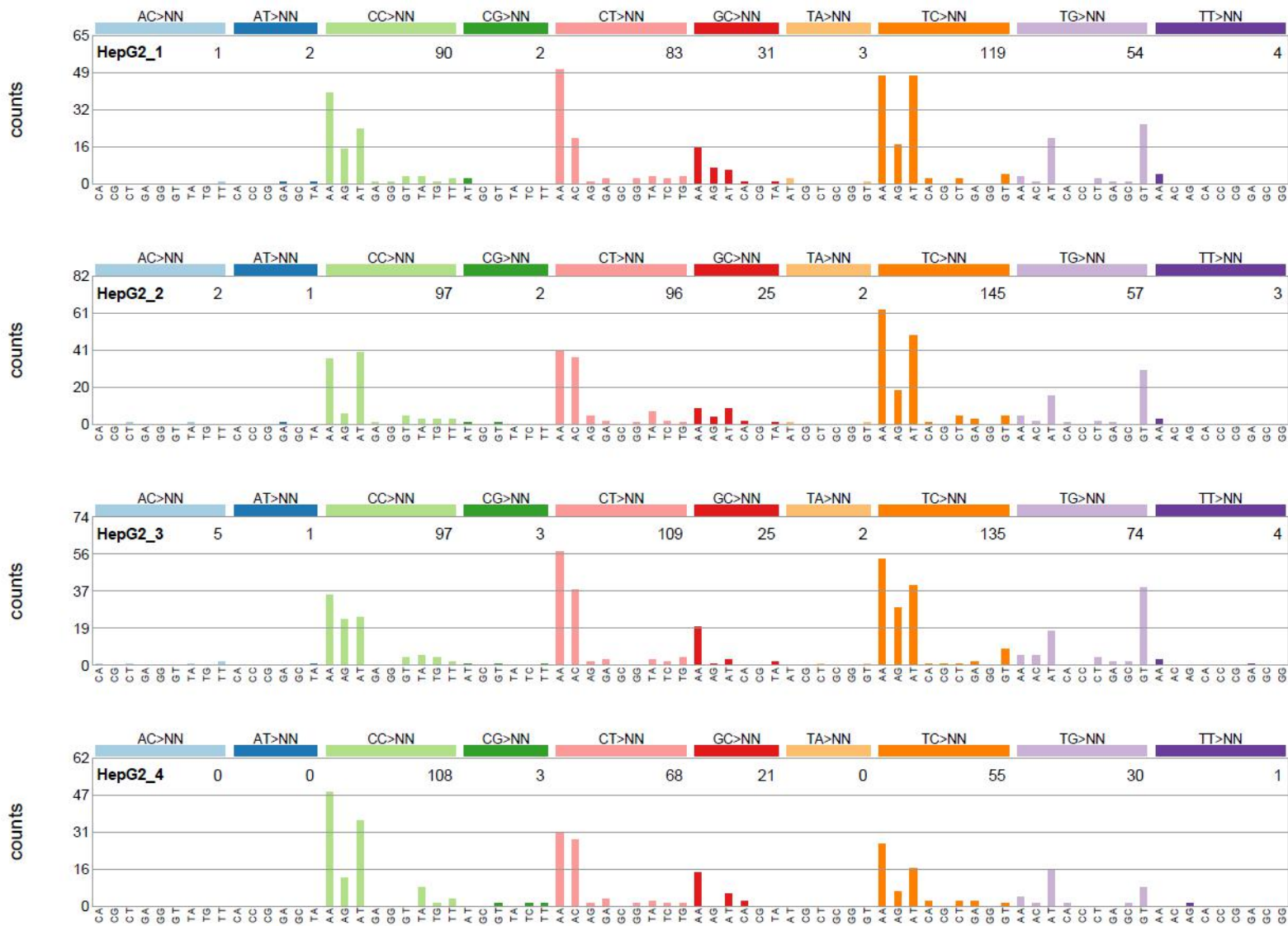
PlotCatalogToPdf(): SBS192 Catalog with no.context = TRUE

*no.context: no preceding and following base context
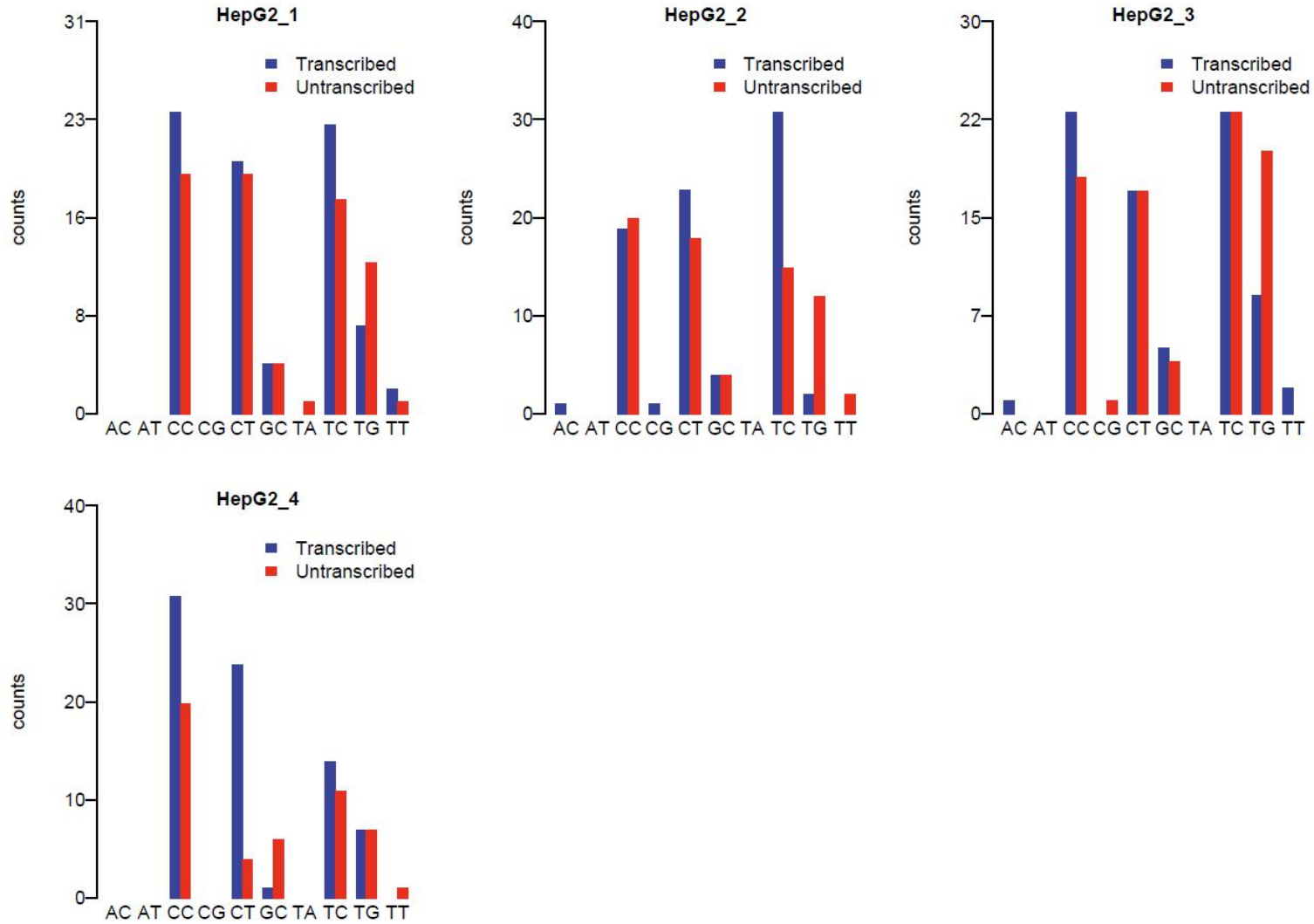
PlotCatalogToPdf(): SBS1536 Catalog

PlotCatalogToPdf(): DBS78 Catalog

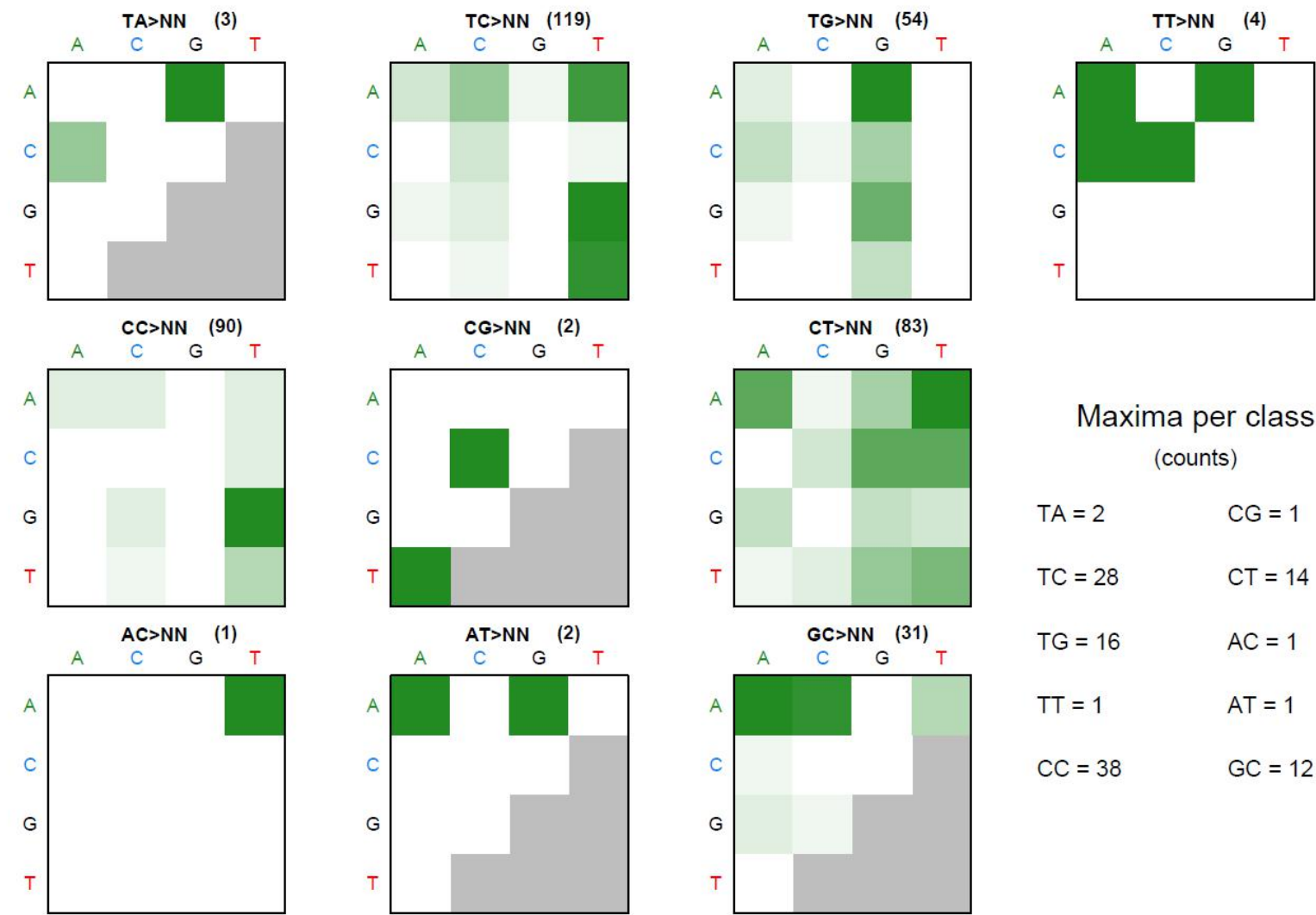# PlotCatalogToPdf(): DBS144 Catalog

PlotCatalogToPdf(): DBS136 Catalog

HepG2_1

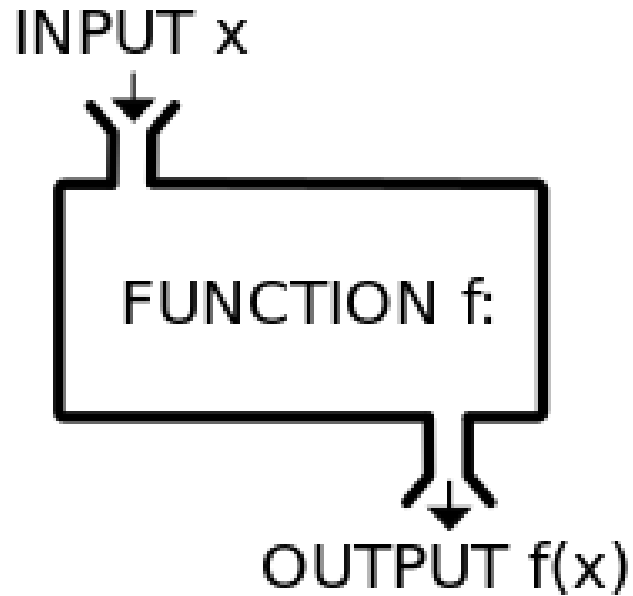Maxima per class (counts)

TA = 2	CG = 1
TC = 28	CT = 14
TG = 16	AC = 1
TT = 1	AT = 1
CC = 38	GC = 12

PlotCatalogToPdf(): Indel Catalog

Important exported functions in ICAMS

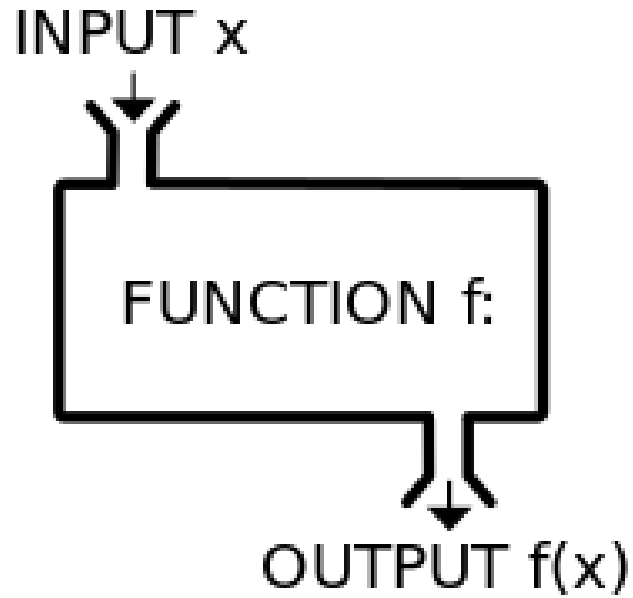https://howtoprogramwithjava.com/functions-in-javascript/

Creating catalogs and plot them to PDF

• StrelkaSBSVCFFilesToCatalogAndPlotToPdf()

• StrelkaIDVCFFilesToCatalogAndPlotToPdf()

• MutectVCFFilesToCatalogAndPlotToPdf()
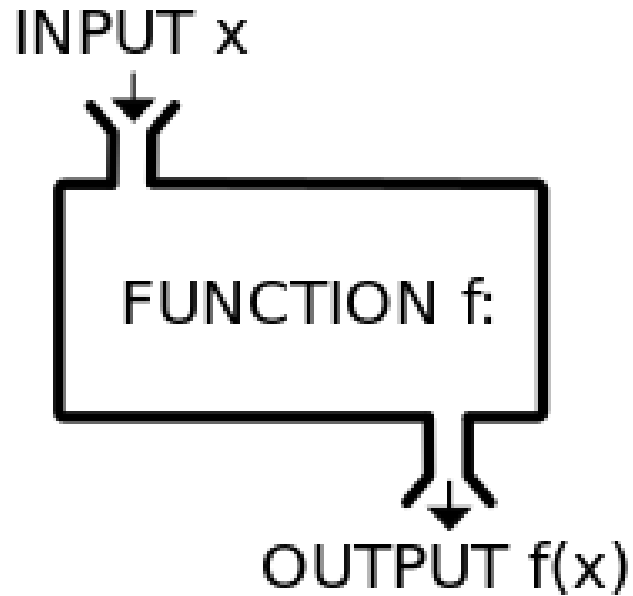
Important exported functions in ICAMS

INPUT x

FUNCTION f:

OUTPUT f(x)

https://howtoprogramwithjava.com/functions-in-javascript/

Reading and writing catalogs

- ReadCatalog()

- WriteCatalog()

Important exported functions in ICAMS

INPUT x

FUNCTION f:

OUTPUT f(x)

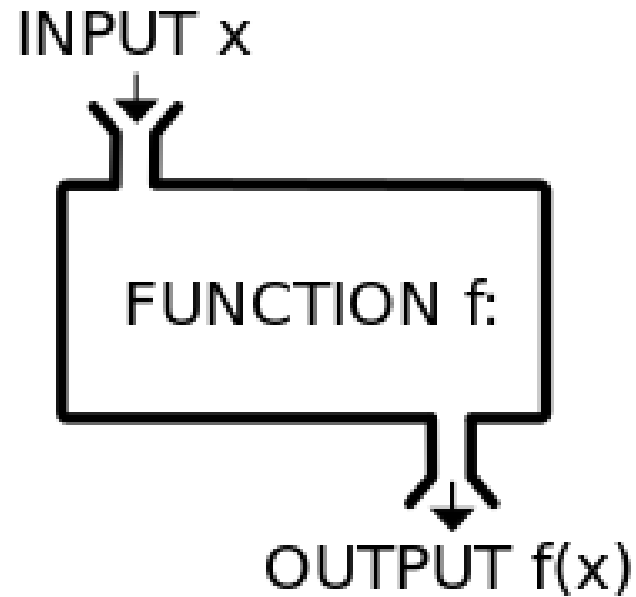https://howtoprogramwithjava.com/functions-in-javascript/

"Collapse" a catalog

- Collapse192CatalogTo96()

- Collapse1536CatalogTo96()

- Collapse144CatalogTo78()

Important exported functions in ICAMS

INPUT x

FUNCTION f:

OUTPUT f(x)

https://howtoprogramwithjava.com/functions-in-javascript/

Utility functions

- TransformCatalog()

- as.catalog()

- revc()