# Appendix 1: Setup of programming environment for RNA-seq

#Note that for this to work, you need to have RTools installed

#Note that R version = 3.5.1

## Clear Global Environment (Code Block 1)

remove(list = ls())

## Set Lib install location for Desktop (Code Block 2)

.libPaths(c("I:/RStudios/RPackRatLibLocations", "I:/RStudios/RPackRat\_2019\_04\_DESEQLibs"))  
PackRatLibLocations <- file.path("I:/RStudios/RPackRat\_2019\_04\_DESEQLibs")

## Set Lib install location for Laptop (Code Block 3)

.libPaths("")   
PackRatLibLocations <- file.path("")

## Set Default Parameters (Code Block 4)

knitr::opts\_chunk$set(echo = TRUE)

## Loading required system packages for install (Code Block 5)

library("yaml", lib.loc = PackRatLibLocations)

## Install Cran packages (Code Block 6)

#Installation of CRAN Packages  
install.packages("devtools")  
library(devtools)  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("foreach", version = "1.4.4", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("bit64", version = "0.9-7", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("Formula", version = "1.2-3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("assertthat", version = "0.2.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("mixsqp", version = "0.1-97", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("latticeExtra", version = "0.6-28", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("blob", version = "1.1.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("yaml", version = "2.2.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("numDeriv", version = "2016.8-1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("pillar", version = "1.3.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("RSQLite", version = "2.1.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("backports", version = "1.1.3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("lattice", version = "0.20-38", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("bbmle", version = "1.0.20", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("digest", version = "0.6.18", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("RColorBrewer", version = "1.1-2", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("checkmate", version = "1.9.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("colorspace", version = "1.4-0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("htmltools", version = "0.3.6", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("Matrix", version = "1.2-16", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("plyr", version = "1.8.4", upgrade = "never"))  
install\_version("XML", version = "3.98-1.19", upgrade = "never")  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("pkgconfig", version = "2.0.2", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("emdbook", version = "1.3.11", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("xtable", version = "1.8-3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("scales", version = "1.0.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("htmlTable", version = "1.13.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("tibble", version = "2.1.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("ggplot2", version = "3.1.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("ashr", version = "2.2-32", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("nnet", version = "7.3-12", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("lazyeval", version = "0.2.2", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("survival", version = "2.43-3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("magrittr", version = "1.5", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("crayon", version = "1.3.4", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("memoise", version = "1.1.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("doParallel", version = "1.0.14", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("MASS", version = "7.3-51.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("truncnorm", version = "1.0-8", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("foreign", version = "0.8-71", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("data.table", version = "1.12.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("stringr", version = "1.4.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("munsell", version = "0.5.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("locfit", version = "1.5-9.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("cluster", version = "2.0.7-1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("Rcpp", version = "1.0.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("iterators", version = "1.0.10", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("rstudioapi", version = "0.10", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("htmlwidgets", version = "1.3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("bitops", version = "1.0-6", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("base64enc", version = "0.1-3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("codetools", version = "0.2-16", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("gtable", version = "0.2.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("DBI", version = "1.0.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("R6", version = "2.4.0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("gridExtra", version = "2.3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("knitr", version = "1.22", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("bit", version = "1.1-14", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("Hmisc", version = "4.2-0", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("pscl", version = "1.5.2", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("stringi", version = "1.4.3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("SQUAREM", version = "2017.10-1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("rpart", version = "4.1-13", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("acepack", version = "1.4.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("xfun", version = "0.5", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("coda", version = "0.19-2", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("readr", version = "1.3.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("VennDiagram", version = "1.6.20", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("gridExtra", version = "2.3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("futile.logger", version = "1.4.3", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("futile.options", version = "1.0.1", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("pkgconfig", version = "2.0.2", upgrade = "never"))  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("dendextend", version = "1.13.4", upgrade = "never"))  
  
  
#Ignore if same results  
#withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("FormatR", version = "1.6", upgrade = "never"))  
#withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("hms", version = "0.4.2", upgrade = "never"))  
#withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("lambda.r", version = "1.2.3", upgrade = "never"))

## Packages that may already be installed directly through R (Code Block 7)

#install\_version("grid", version = "3.5.1") #Preinstalled.... System Tool?  
#install\_version("compiler", version = "3.5.1") #Preinstalled.... System Tool?  
#install\_version("tools", version = "3.5.1") #Preinstalled.... System Tool?  
#withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("splines", version = "3.5.1", upgrade = "never"))

## Packages that do not appear to be in the Cran DB (Code Block 8)

#install\_version("GenomeInfoDbData", version = "1.1.0") #Where is this from

## Packages that the right version appears unable to be found (Code Block 9)

#install\_version("rlang", version = "0.3.1") #From Bioconductor? #Downloading through CRAN, but failing to install #Is this Important?  
#install\_version("RCurl", version = "1.95-4.12") #From Bioconductor? #Downloading through CRAN, but failing to install #Is this Important?

## Installation of Bioconductor and Packages (Code Block 10)

source("https://bioconductor.org/biocLite.R")  
biocLite("AnnotationDbi", version = "1.42.1", suppressUpdates = TRUE)  
biocLite("XVector", version = "0.20.0", suppressUpdates = TRUE)  
biocLite("genefilter", version = "1.62.0", suppressUpdates = TRUE)  
biocLite("zlibbioc", version = "1.26.0", suppressUpdates = TRUE)  
biocLite("apeglm", version = "1.2.1", suppressUpdates = TRUE)  
biocLite("annotate", version = "1.58.0", suppressUpdates = TRUE)  
biocLite("geneplotter", version = "1.58.0", suppressUpdates = TRUE)  
biocLite("AnnotationDbi", version = "1.42.1", suppressUpdates = TRUE)  
  
biocLite("DESeq2", version = "1.20.0", suppressUpdates = TRUE)  
biocLite("SummarizedExperiment", version = "1.10.1", suppressUpdates = TRUE)  
biocLite("DelayedArray", version = "0.6.6", suppressUpdates = TRUE)  
biocLite("BiocParallel", version = "1.14.2", suppressUpdates = TRUE)  
biocLite("matrixStats", version = "0.54.0", suppressUpdates = TRUE)  
biocLite("Biobase", version = "2.40.0", suppressUpdates = TRUE)  
biocLite("GenomicRanges", version = "1.32.7", suppressUpdates = TRUE)  
biocLite("GenomeInfoDb", version = "1.16.0", suppressUpdates = TRUE)  
biocLite("IRanges", version = "2.14.12", suppressUpdates = TRUE)  
#biocLite("S4Vectors", version = "0.18.3", suppressUpdates = TRUE)  
biocLite("S4Vectors", version = "0.19.11", suppressUpdates = TRUE)  
biocLite("BiocGenerics", version = "0.26.0", suppressUpdates = TRUE)

## Installation of packages for Volcano plot analysis (Code Block 11)

library(devtools)  
withr::with\_libpaths(new = PackRatLibLocations, code = install\_version("ggrepel", upgrade = "never"))

## Install GenomeInfoDbData from source Package (Code Block 12)

library(devtools)  
  
install.packages("E:/Dropbox/Dropbox/Harrison Lab - Trevor Randall/RNASeq Analysis/RNASeqAnlyPkrat\_2020\_03/Source Packages/GenomeInfoDbData\_1.2.0.tar.gz", repos = NULL, type="source")  
  
install.packages('E:/Dropbox/Dropbox/Harrison Lab - Trevor Randall/RNASeq Analysis/RNASeqAnlyPkrat\_2020\_03/Source Packages/EnhancedVolcano\_1.6.0.zip', repos = NULL)  
  
install.packages("E:/Dropbox/Dropbox/Harrison Lab - Trevor Randall/RNASeq Analysis/RNASeqAnlyPkrat\_2020\_03/Source Packages/caTools\_1.17.1.3.tar.gz", repos = NULL, type="source")  
  
  
install\_github("jokergoo/ComplexHeatmap@17eda13", force = TRUE) #Install Version 2.5.3, 17eda13 is the commit ID  
  
#install\_github("jokergoo/ComplexHeatmap@ea8dcf77", force = TRUE) #Install Version 2.5.2, ea8dcf77 is the commit ID