RStudio/Shiny installation instructions

Download/Install R

1. To download the latest R-release open in Chrome browser:

https://cran.r-project.org/bin/windows/base/

Click on 'Download R 3.6.1 for Windows' link

2. In browser, right click on R-3.6.1-win.exe file and choose 'Go to File'
3. In downloads, right click on same file and choose 'Run with elevated privileges', give a reason and enter your password
4. Choose 'english', and defaults for other choices, install R into C:\Users\[your username] directory

Get RStudio

1. From the https://rstudio.com/products/rstudio/download/ install RStudio Desktop v 1.1.419
2. Launch RStudio from the start menu
3. It takes a while for the 'Files' window (file explorer) in the right bottom corner to link to default directory, must wait
4. Check that RStudio is pointing to the directory where you installed the R binaries above: In top toolbar, go to 'Tools', 'Global Options' and check what folder is indicated in your 'R version:'. Should be in a folder where you installed above (ends up in C:\Users\[your username]\R-3.6.1)

Install tidyverse and shiny

Install the tidyverse package by running the command:
```
install.packages("tidyverse")
```
in the console window and press Enter

Install rshiny by running the command:
```
install.packages("shiny")
```

Verify installation by running the following and observing no errors are raised
```
library(tidyverse);library(shiny)
```

Run Survival Analysis example in RStudio

We will be saving work from assignments in the work area of C:\Users\[your username]\R\work. Go ahead and create work folder under username.

In RStudio choose, 'File', 'New File', 'RScript' and paste in the following text:

#SET WORKING DIRECTORY

```
setwd("C:\Users\[your username]\R\work ")
```

#READ IN SAS DATASET

```
install.packages("haven")
library(haven) #include haven package for compressed data in session
```

#Create a temp dataset adtteeff with PARAMCD=OS

```
adtte <- read_sas("adtte.sas7bdat") #read in SAS dataset
```

#KAPLAN-MEIER ESTIMATES

```
install.packages("survival")
library(survival)
os_data <- subset(adtte, PARAMCD=="OS")  #subset data for Overall Survival
summary(os_data$AVAL) #descriptives aval
attach(os_data) #can refer to variables without data name
result.km <- survfit(Surv(AVAL, CNSR) ~ TRT01P,  data=os_data)  #surv function creates the survival function
```

#survfit function computes estimate of Kaplan-Meier survival curve
```
summary(result.km)
```

#PLOT SURVIVAL DATA
```
plot(result.km, col=c("red", "blue"),
    main = "Kaplan-Meier Curve for Overall Survival", xlab="Days", ylab="Percent Survival",
    font.lab=2)
```

#RUN COX proportional hazards model

```
result.coxph <- coxph(Surv(AVAL, CNSR) ~ TRT01P + RACE + SEX, data=os_data)
summary(result.coxph)
```

1. To run entire script highlight in program window to run sections with 'Run' button or try 'CTRL-ENTER'
2. Console window at bottom left is the R script log, can submit code there also.
3. View datasets you have read in and stat analyses from Global Environment window
4. File explorer under 'Files' tab bottom right, Plot outputs appear under 'Plots' tab, you can export the plot as a pdf or image and place it on local drive.
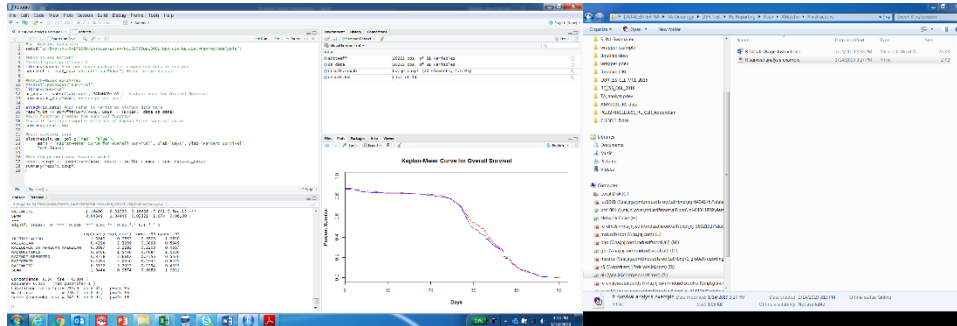
R Learning Resources

Below link you can find information on the packages that are available for download. Within each package are functions that require input arguments. For instance, from the survival package, we are using the Survfit and Surv functions in the script above to create the Kaplan-Meier curves. You must specify arguments within the function call, much like macro parameters within SAS. Some arguments are required, some are optional.

https://www.rdocumentation.org/packages/survival/versions/2.11-4/topics/survfit

R and Shiny Learning Resources

Quick R learning resources:

https://www.rstudio.com/online-learning/

RShiny learning resources:

https://shiny.rstudio.com/tutorial/

https://www.datacamp.com/home

Cheatsheets

https://www.rstudio.com/resources/cheatsheets/