#R Program to Calculate Survival Probability of Kidney Carcinoma Patients using Hypertabastic Proportional Hazards Model

#'Time: Continuous (in months)

#'Age: Continuous (in years)

#'Gender:

#' 0=Female 1=Male

#'Race:

#' 0=White 1=Hispanic 2=Asian 3=Black

#'Histology:

#' 0=Other 1=Adeno 2=Papillary 3=Clear 4=Renal

#' 5=Chromophobe 6=Sarcomatoid 7=Granular

#'Region:

#' 0=Southwest 1=East 2=North 3=Pacific

#'Stage:

#' 0=Regional 1=Localized 2=Distant

#'Grade:

#' 0=Undifferentiated 1=Well 2=Moderate 3=Poor

#'Site:

#' 0=Other 1=No\_Surgery 2=Cryo13 3=Thermal 4=Cryo23 5=Part\_Neph/Part\_Uret

#' 6=Complete\_Neph 7=Radical 8=Any\_Neph

#Read in Function

Survival\_Probability <- function(Time,Age,Gender,Race,Histology,Region,Stage,Grade,Site){

start = c(2,5,12,15,17,20) #Initialize

input = c(Race,Histology,Region,Stage,Grade,Site) #Record part of input

B = c(Age,Gender,integer(27)) #Create vector of parameters

place = start + input #Set location in vector to be changed

for(i in 1:6){if(input[i] == 0){}else{B[place[i]] = 1}} #Set vector locations = 1

Beta = -sum(B\*c(-0.011576,-0.016056,-0.081035,-0.041793,-0.13937,0.228189,0.532579,0.565283,

0.323947,1.187381,-0.280902,0.376178,0.015638,0.068913,0.050401,1.221175,

-1.420683,1.176737,0.999862,0.419985,-1.167472,0.736603,0.487928,0.440444,

1.012776,0.090548,-0.094567,-0.270463,-0.135374)) #Set beta values

return(1/cosh(0.104941\*(1-(Time)^0.331843\*1/tanh((Time)^0.331843))/0.331843)^exp(Beta)) #Output

}

#Answer to Proposed Question

Survival\_Probability(Time = 60,Age=55,Gender=1,Race=0,Histology=1,

Region=2,Stage=2,Grade=3,Site=7)