Quiz4

1. Consider the following function

Text

Description automatically generated

If a cell has the formula =Looper(0), what value will the cell have?

an error

15

12

**0**

2. Suppose you run a macro MacroTest defined by code like

Sub MacroTest

Last = Cells(3,3)

Range(..., Last).FormulaR1C1 = 5

End Sub

How can you fill in the blank so that the macro gives cell B3 a value of 5, and changes at most one other cell?

Cells(3,3)

Cells(2,3)

Cells(2,2)

**Cells(3,2)**

3. Function PlusThree(x,y)

PlusThree = x + 3

End Function

Function PlusPlus(x,y,z)

PlusPlus = x + y + z

End Function

Function Ampersand(x,y)

Ampersand = x & y

End Function

Function CAmpersand(x,y)

CAmpersand = CLng(CStr(x) & CStr(y))

End Function

Which of the following functions will result in a cell having a value of 5?

=PlusPlus(2,3)

**=PlusThree(2,3)**

=CAmpersand(2,3)

=Ampersand(2,3)

3) [2 pts] Create a function called InterpolatedYield, which inputs:

yield curve (with data for years 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

time in years

and which outputs:

for times below 1, the yield curve at year 1

for times above 10, the yield curve at year 10

for times between 1 and 10, the linearly interpolated value between the two closest points on the yield curve (as described, e.g. in this Wikipedia article on linear interpolation (Links to an external site.))

Example: At 5.25 years, the interpolated yield should be one-quarter of the way from the 5-year yield to the 6-year yield. Cell B35 of BondValueWithInterpolation has one such calculation, which calculates the value one-quarter of the way from 0.80% to 0.96%, and gets 0.84%.

Hint: You are welcome to use the approx function, but it may be easier to answer the question directly.

InterpolatedYield <- function(yieldCurve, timeInYears){

interp = approx(1:10,

yieldCurve,

xout = c(timeInYears),

yleft = yieldCurve[1],

yright = tail(yieldCurve, 1))

return(interp$y)

}

Quiz 5

1. In R, what character begins a line of comments?

'

all of the answers here are correct ways of indicating a comment line in R

**#**

"

1. In R, which of the following is most likely to be a correct line of code in a FizzBuzz function?

if (x %% 15 == 0) then

if (x %% 15 = 0) then

if (x %% 15 = 0){

if (x %% 15 == 0){

1. Suppose that some R code begins with

appr <- c(1)

rate <- 0.03

time <- 3.00

Which of these loops is the best way to have appr contain a series of successively better approximations to exp(-rate \* time), which would be the result of continuous compounding?

for(i in 0:12){ appr = (1 - rate/i) ^ (time \* i) }

for(i in 0:12){ appr[i] = (1 - rate/i) ^ (time \* i) }

for(i in 1:12){ appr = (1 - rate/i) ^ (time \* i) }

for(i in 1:12){ appr[i] = (1 - rate/i) ^ (time \* i) }

Quiz 6

1. Which of these has the same value as the R expression *c(1,2,3)+1?*

**c(2,3,4)**

c(1,2,3,4)

c(1,2,3,1)

c(1,1,2,3)

1. Which of the following describes the following code?

candidates <- 20:30  
squares <- candidates \* candidates  
errors <- abs(squares - 700) “this calculates a vector of \*flags\* for which errors are minimal”  
minerrors <- errors == min(errors)  
mincandidate <- candidates[minerrors]

All of the other answers are correct.

It finds the integer whose square is as close to 700 as possible.

It gets entry *i* in *candidates*, where *i* is the index of the minimum value of *errors*.

It calculates a number which is within 1 of the square root of 700.

1. Suppose a portfolio has 100 shares of WBA and 200 shares of XOM, and a dataframe called *history* has two columns: one with prices for WBA and one with prices for XOM for some dates. Which of the following is correct about the portfolio values or portfolio returns on those dates?

Hint: You can try out an example with *history = data.frame(WBA = c(31,32,33), XOM = c(46,45,44))*

(history$WBA \* 100 + history$XOM \* 200) calculates the values

(history$WBA \* 100 + history$XOM \* 200) calculates the returns

(c(100, 200) %\*% as.matrix(history)) calculates the values

(c(100, 200) %\*% as.matrix(history)) calculates the returns

Quiz7

1. Let *samp* be the result of using *rnorm* to take a sample of a normal distribution with mean 3 and standard deviation 7, and with 320722 elements in the sample.

What do you get from *quantile(samp, 0.22)*?

(This should give roughly the 70559th-smallest element of the sample; it may not give the same result every time, so keep a record of what code you used in case any questions come up later.)

-2.42

2. The PortfolioReturns function in the hints and tests for some of our homeworks reads:

PortfolioReturns <- function(port, history){  
  tickers     <- port$ticker  
  stockMatrix <- as.matrix(history[,tickers])  
  portfolios  <- stockMatrix %\*% port$shares  
  rows        <- nrow(history)  
  returns     <- portfolios[2:rows] / portfolios[1:(rows-1)] - 1  
  return(returns)  
}

When you run those tests, which of the five variables defined in this function has the *most numbers*?

stockMatrix

3.The PortfolioReturns function in the hints and tests for some of our homeworks reads:

PortfolioReturns <- function(port, history){  
  tickers     <- port$ticker  
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  portfolios  <- stockMatrix %\*% port$shares  
  rows        <- nrow(history)  
  returns     <- portfolios[2:rows] / portfolios[1:(rows-1)] - 1  
  return(returns)  
}

When you run those tests, which of the five variables defined in this function has the *fewest numbers*?

Tickers

Quiz 8

1. We looked at a table from Moody's showing changes of bond ratings. In order to apply our transition-matrix functions, we converted that table into a square matrix. According to this conversion, how will bonds without ratings in one quarter be distributed in the next quarter?

  all without rating in the next quarter

1. Calculate two linear models for the *cars* data (i.e. regressions using the *lm* function), where:

* *Fit1* has the formula: *dist ~ speed*
* *Fit0* has the formula: *dist ~ speed + 0*

Then *Fit1* is an ordinary linear fit, and *Fit0* is a fit with the constant coefficient constrained to be 0.

Let *y* be the value of *Fit1* for a car going 10 mph.

Let *z* be the value of *Fit0* for a car going 10 mph.

What is *y - z*?

Between -7 and -8

1. Suppose you create one vector of normal variables and one vector of lognormal variables with

norms <- rnorm(100, 0, 1)  
lnorms <- rlnorm(100, 0, 1)

Which of the following is most likely true of the two vectors?

none of the other answers is likely