Quiz 1 - Week #1

Due No due date **Points** 20 **Questions** 10 **Time Limit** None

Instructions

Quiz is open book with no time limit. However, the quiz must be taken in one sitting.

Some questions are numerical input. Enter your answers with three decimal places of precision, e.g. 2.123.

It is recommended that you watch the course video on matrix computations and run the sample R code associated with the video before you take this quiz. Everything that you need to know to complete this quiz is discussed in that course video.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	37 minutes	16 out of 20

Score for this quiz: **16** out of 20
Submitted Jan 12 at 10:07pm
This attempt took 37 minutes.

Question 1

0 / 2 pts

Consider a discrete distribution with support values 1,2,3,4,5.
Each value has an equal probability. Compute the mean of this distribution using matrix multiplication.

```
w <- rep(0.2,5);
x <- seq(1,5,1);
```

Matrix multiply w and x to compute the mean. Enter your answer with three decimal places of precision, e.g. 2.123.

ou Answered 0.6

orrect Answers 3.0 (with margin: 0.01)

0.0 (with margin: 0.0)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)

Question 2

0 / 2 pts

Consider a discrete distribution with support values 1,2,3,4,5.
In this distribution each value does not have an equal probability.
Compute the mean of this distribution using matrix multiplication.

w <- c(0.1,0.1,0.1,0.2,0.5);
x <- seq(1,5,1);

Matrix multiply w and x to compute the mean. Enter your answer with three decimal places of precision, e.g. 2.123.

'ou Answered

0.78

orrect Answers

3.9 (with margin: 0.01)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)

Question 3

2 / 2 pts

Define the matrix A as follows. Compute the inverse of A.

a <- c(1,2,5,10);
A <- matrix(data=a,nrow=2,ncol=2,byrow=FALSE);

Correct!

Error in solve.default(A) : Lapack routine dgesv: system is exactly singular: U[2,2] = 0

[1,] 0.11111111 -0.05555556 [2,] -0.02222222 0.11111111

[1,] 1 5 [2,] 2 10

No answer text provided.

Question 4

2 / 2 pts

Define the matrix A as follows. Compute the inverse of A.

a <- c(10,2,5,10);
A <- matrix(data=a,nrow=2,ncol=2,byrow=FALSE);

Correct!

- [1,] 0.11111111 -0.05555556 [2,] -0.02222222 0.11111111
- [1,] 1 5 [2,] 2 10
- Error in solve.default(A) : Lapack routine dgesv: system is exactly singular: U[2,2] = 0
- No answer text provided.

Question 5

2 / 2 pts

Define the matrix A as follows. Compute the transpose of A.

a <- c(3,2,7,1);
A <- matrix(data=a,nrow=2,ncol=2,byrow=FALSE);

Correct!

- [1,] 3 2 [2,] 7 1
- [1,] 0.11111111 -0.05555556 [2,] -0.02222222 0.11111111

[1,] 3 7 [2,] 2 1

Error in solve.default(A) : Lapack routine dgesv: system is exactly singular: U[2,2] = 0

Question 6

2 / 2 pts

Define the matrix A as follows. Compute the eigenvalues of A. What is the largest eigenvalue?

```
a <- c(3,2,7,1);
A <- matrix(data=a,nrow=2,ncol=2,byrow=FALSE);
```

Correct!

5.873

orrect Answers

5.8729 (with margin: 0.01)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)

Question 7

2 / 2 pts

Define the matrix A as follows. Compute the eigenvalues and eigenvectors of A. What is the eigenvector that corresponds to the largest eigenvalue?

```
a <- c(3,2,2,7,1,7);
A <- matrix(data=a,nrow=3,ncol=3,byrow=FALSE);
```

Correct!

-0.7356134 -3.444956e-01 -0.5832629

0.3343019 -5.863739e-01 0.7378400

-0.7071068 -9.672792e-17 0.7071068

No answer text provided.

Question 8

2 / 2 pts

If A[3,2] and B[3,3] can we multiply A%*%B?

Correct!

No, the matrices are not conformable, i.e. they do not have the correct dimensions to allow matrix multiplication.

Yes, and the result is a [3,3] matrix.

Yes, and the result is a [3,2] matrix.

Yes, and the result is a [2,3] matrix.

Question 9

2 / 2 pts

If A[3,2] and B[3,3] can we multiply t(A)%*%B?

Correct!

Yes, and the result is a [2,3] matrix.

Yes, and the result is a [3,3] matrix.

No, the matrices are not conformable, i.e. they do not have the correct dimensions to allow matrix multiplication.

Yes, and the result is a [3,2] matrix.

Question 10

2 / 2 pts

If A[3,2] and B[3,3] can we multiply t(A)%*%t(B)?

Correct!

- (selected) Yes, and the result is a [2,3] matrix.
- No, the matrices are not conformable, i.e. they do not have the correct dimensions to allow matrix multiplication.
- Yes, and the result is a [3,3] matrix.
- Yes, and the result is a [3,2] matrix.

Quiz Score: **16** out of 20