Reporte de Examen práctico.

Problema 10: Multiplicar dos matrices.

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Código en el lenguaje Fortran

```
PROGRAM MatrizMultiplicacion
 IMPLICIT NONE
 INTEGER, PARAMETER :: N = 3
 INTEGER :: A(N, N), B(N, N), C(N, N)
 INTEGER :: I, J, K

 ! Matrices
 A = RESHAPE((/1, 2, 3, 4, 5, 6, 7, 8, 9/), (/N, N/))
 B = RESHAPE((/9, 8, 7, 6, 5, 4, 3, 2, 1/), (/N, N/))

 C = 0

 ! Multiplicacion de matrices
 DO I = 1, N
  DO J = 1, N
   DO K = 1, N
    C(I, J) = C(I, J) + A(I, K) * B(K, J)
   END DO
  END DO
 END DO

 PRINT *, 'Matriz A:'
 DO I = 1, N
  PRINT '(3I5)', (A(I, J), J = 1, N)
 END DO

 PRINT *, 'Matriz B:'
 DO I = 1, N
  PRINT '(3I5)', (B(I, J), J = 1, N)
 END DO

 PRINT *, 'Resultado de A * B:'
 DO I = 1, N
  PRINT '(3I5)', (C(I, J), J = 1, N)
 END DO
```

Ejecución

```
Matriz A:
    1    4    7
    2    5    8
    3    6    9
Matriz B:
    9    6    3
    8    5    2
    7    4    1
Resultado de A * B:
   90   54   18
  114   69   24
  138   84   30


...Program finished with exit code 0
Press ENTER to exit console.
```

END PROGRAM MatrizMultiplicacion	

Código en el lenguaje Pascal	Ejecución

```
program MatrizMultiplicacion;
const
  N = 3;
type
  Matriz = array[1..N, 1..N] of integer;
var
  A, B, C: Matriz;
  i, j, k: integer;

begin
  // Matrices
  for i := 1 to N do
    for j := 1 to N do
    begin
      A[i, j] := (i - 1) * N + j;
      B[i, j] := N * (N - i + 1) - (j - 1);
    end;

  for i := 1 to N do
    for j := 1 to N do
      C[i, j] := 0;

  // Multiplicación de matrices
  for i := 1 to N do
    for j := 1 to N do
      for k := 1 to N do
        C[i, j] := C[i, j] + A[i, k] * B[k, j];

  writeln('Matriz A:');
  for i := 1 to N do
  begin
    for j := 1 to N do
      write(A[i, j]:4);
    writeln;
  end;
```

```
Compiling principal.pas
Linking a.out
51 lines compiled, 0.0 sec
Matriz A:
   1   2   3
   4   5   6
   7   8   9
Matriz B:
   9   8   7
   6   5   4
   3   2   1
Resultado de A * B:
  30  24  18
  84  69  54
 138 114  90


...Program finished with exit code 0
Press ENTER to exit console.
```

```
 writeln('Matriz B:');
 for i := 1 to N do
 begin
  for j := 1 to N do
   write(B[i, j]:4);
  writeln;
 end;

 writeln('Resultado de A * B:');
 for i := 1 to N do
 begin
  for j := 1 to N do
   write(C[i, j]:4);
  writeln;
 end;
end.
```

Código en el lenguaje C/C++	Ejecución

```
#include <iostream>

const int N = 3;

void multiplyMatrices(int A[N][N], int B[N][N], int
C[N][N]) {
   for (int i = 0; i < N; ++i) {
      for (int j = 0; j < N; ++j) {
         C[i][j] = 0;
         for (int k = 0; k < N; ++k) {
            C[i][j] += A[i][k] * B[k][j];
         }
      }
   }
}

void printMatrix(int matrix[N][N]) {
   for (int i = 0; i < N; ++i) {
      for (int j = 0; j < N; ++j) {
         std::cout << matrix[i][j] << " ";
```

```
Matriz A:
1 2 3
4 5 6
7 8 9

Matriz B:
9 8 7
6 5 4
3 2 1

Resultado de A * B:
30 24 18
84 69 54
138 114 90


...Program finished with exit code 0
Press ENTER to exit console.
```

```
      }
      std::cout << std::endl;
   }
}

//Matrices
int main() {
   int A[N][N] = {
      {1, 2, 3},
      {4, 5, 6},
      {7, 8, 9}
   };
   int B[N][N] = {
      {9, 8, 7},
      {6, 5, 4},
      {3, 2, 1}
   };
   int C[N][N];

   multiplyMatrices(A, B, C);

   std::cout << "Matriz A:" << std::endl;
   printMatrix(A);
   std::cout << std::endl;

   std::cout << "Matriz B:" << std::endl;
   printMatrix(B);
   std::cout << std::endl;

   std::cout << "Resultado de A * B:" << std::endl;
   printMatrix(C);

   return 0;
}
```

Código en el lenguaje Java	Ejecución

```
public class MatrizMultiplicacion {
   public static void main(String[] args) {
      int N = 3;
      int[][] A = {
         {1, 2, 3},
```

```
        {4, 5, 6},
        {7, 8, 9}
    };
    int[][] B = {
        {9, 8, 7},
        {6, 5, 4},
        {3, 2, 1}
    };
    int[][] C = new int[N][N];

    // Multiplicacion de matrices
    for (int i = 0; i < N; i++) {
        for (int j = 0; j < N; j++) {
            for (int k = 0; k < N; k++) {
                C[i][j] += A[i][k] * B[k][j];
            }
        }
    }


    System.out.println("Matriz A:");
    printMatrix(A);
    System.out.println("\nMatriz B:");
    printMatrix(B);
    System.out.println("\nResultado de A * B:");
    printMatrix(C);
  }

  public static void printMatrix(int[][] matrix) {
    for (int i = 0; i < matrix.length; i++) {
        for (int j = 0; j < matrix[0].length; j++) {
            System.out.print(matrix[i][j] + " ");
        }
        System.out.println();
    }
  }
}
```

```
Matriz A:
1 2 3
4 5 6
7 8 9

Matriz B:
9 8 7
6 5 4
3 2 1

Resultado de A * B:
30 24 18
84 69 54
138 114 90
------------------------------
BUILD SUCCESS
------------------------------
```