Experiment 6: Array

6.4. WAP that reads two matrices A (m x n) and B (p x q) and computes the product A and B. Read matrix A and matrix B in row major order respectively. Print both the input matrices and resultant matrix with suitable headings and output should be in matrix format only. Program must check the compatibility of orders of the matrices for multiplication. Report appropriate message in case of incompatibility

Ans-:

```
        #include <stdio.h>

int main() {

   printf("Name - Aryan kamboj\nSAP ID - 590025526\ncourse - BCA\nBatch - 6");
   printf("\n----------------------\n");

   int m, n, p, q;

   // Read dimensions of matrix A
   printf("Enter number of rows and columns for Matrix A: ");
   scanf("%d %d", &m, &n);

   // Read dimensions of matrix B
   printf("Enter number of rows and columns for Matrix B: ");
   scanf("%d %d", &p, &q);

   // Check compatibility
   if (n != p) {
      printf("Matrix multiplication not possible. Columns of A must equal rows of B.\n");
      return 0;
   }

   int A[m][n], B[p][q], C[m][q];

   // Read matrix A
   printf("Enter elements of Matrix A (row-wise):\n");
   for (int i = 0; i < m; i++) {
      for (int j = 0; j < n; j++) {
         scanf("%d", &A[i][j]);
      }
   }
```

```
// Read matrix B
printf("Enter elements of Matrix B (row-wise):\n");
for (int i = 0; i < p; i++) {
    for (int j = 0; j < q; j++) {
        scanf("%d", &B[i][j]);
    }
}

// Initialize result matrix C with 0
for (int i = 0; i < m; i++)
    for (int j = 0; j < q; j++)
        C[i][j] = 0;

// Perform multiplication
for (int i = 0; i < m; i++) {
    for (int j = 0; j < q; j++) {
        for (int k = 0; k < n; k++) {
            C[i][j] += A[i][k] * B[k][j];
        }
    }
}

// Print Matrix A
printf("\nMatrix A:\n");
for (int i = 0; i < m; i++) {
    for (int j = 0; j < n; j++) {
        printf("%d\t", A[i][j]);
    }
    printf("\n");
}

// Print Matrix B
printf("\nMatrix B:\n");
for (int i = 0; i < p; i++) {
    for (int j = 0; j < q; j++) {
        printf("%d\t", B[i][j]);
    }
    printf("\n");
}

// Print Resultant Matrix C
printf("\nProduct of A and B (Matrix C):\n");
for (int i = 0; i < m; i++) {
    for (int j = 0; j < q; j++) {
        printf("%d\t", C[i][j]);
    }
```

```
        printf("\n");
    }

    return 0;
}
```

Output: