SVKM's NMIMS

Mukesh Patel School of Technology Management and Engineering, Mumbai

Programming for Problem Solving (Exp 7)

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Task 1:

123450

Task 2:

```
#include <iostream>

using namespace std;

int main() {
   int size_arr_x, size_arr_y;
   cout << "Enter the size of the array (x,y): ";
   cin >> size_arr_x >> size_arr_y;
   int two_dim_arr[size_arr_x][size_arr_y];
   cout << endl;

   for (int x = 0; x < size_arr_x; x++) {
      for (int y = 0; y < size_arr_y; y++) {
         cout << "Enter the value at (" << x + 1 << ", " << y + 1 << "): ";
         cin >> two_dim_arr[x][y];
      }
   }

   int choice, sum_diagonal = 0, transpose_arr[size_arr_y][size_arr_x];
   cout << "\nChoose an option:\n1. Sum of elements of each row\n2.
Sum of diagonal elements\n3. Finding transpose of matrix\n";
   cin >> choice;
   switch (choice) {
   case 1:
      cout << "\nSum of elements of Rows:\n";
      for (int x = 0; x < size_arr_x; x++) {
```

```
      int sum_row = 0;
      for (int y = 0; y < size_arr_y; y++) {
         sum_row += two_dim_arr[x][y];
      }
      cout << x + 1 << ": " << sum_row << endl;
   }
   break;
case 2:
   for (int x = 0; x < size_arr_x; x++) {
      for (int y = 0; y < size_arr_y; y++) {
         if (x == y) {
            sum_diagonal += two_dim_arr[x][y];
         }
      }
   }
   cout << "\nSum of Diagonal Elements:" << sum_diagonal << endl;
   break;
case 3:
   cout << "\nTranspose Array:\n";
   for (int x = 0; x < size_arr_x; x++) {
      for (int y = 0; y < size_arr_y; y++) {
         transpose_arr[y][x] = two_dim_arr[x][y];
      }
   }
   for (int x = 0; x < size_arr_y; x++) {
      for (int y = 0; y < size_arr_x; y++) {
         cout << "   " << transpose_arr[x][y] << "   ";
      }
      cout << endl;
   }
   break;
default:
   cout << "\nThat is not a valid option!";
   break;
}
```

```
    return 0;
}
```

Task 3:

```
#include <iostream>

using namespace std;

int main() {
    int size_arr_m, size_arr_n;
    cout << "Enter the size of the array A (m x n): ";
    cin >> size_arr_m >> size_arr_n;
    int arr_A[size_arr_m][size_arr_n];
    cout << endl;

    for (int m = 0; m < size_arr_m; m++) {
        for (int n = 0; n < size_arr_n; n++) {
            cout << "Enter the value at A (" << m + 1 << ", " << n + 1 << "): ";
            cin >> arr_A[m][n];
        }
    }

    int size_arr_p, size_arr_q;
    cout << "\nEnter the size of the array B (p x q): ";
    cin >> size_arr_p >> size_arr_q;
    int arr_B[size_arr_p][size_arr_q];
    cout << endl;

    for (int p = 0; p < size_arr_p; p++) {
        for (int q = 0; q < size_arr_q; q++) {
            cout << "Enter the value at B (" << p + 1 << ", " << q + 1 << "): ";
            cin >> arr_B[p][q];
```

```
    }
}

int final_arr[size_arr_m][size_arr_n];
for (int m = 0; m < size_arr_m; m++) {
    for (int q = 0; q < size_arr_q; q++) {
        final_arr[m][q] = 0;
    }
}
if (size_arr_n == size_arr_p) {
    for (int m = 0; m < size_arr_m; m++) {
        for (int n = 0; n < size_arr_n; n++) {
            for (int q = 0; q < size_arr_q; q++) {
                final_arr[m][q] += arr_A[m][n] * arr_B[n][q];
            }
        }
    }
    cout << "\n\nArray A:\n";
    for (int m = 0; m < size_arr_m; m++) {
        for (int n = 0; n < size_arr_n; n++) {
            cout << "   " << arr_A[m][n] << "   ";
        }
        cout << endl;
    }
    cout << "\n\nArray B:\n";
    for (int p = 0; p < size_arr_p; p++) {
        for (int q = 0; q < size_arr_q; q++) {
            cout << "   " << arr_B[p][q] << "   ";
        }
        cout << endl;
    }
    cout << "\n\nProduct Array:\n";
    for (int m = 0; m < size_arr_m; m++) {
        for (int q = 0; q < size_arr_q; q++) {
            cout << "   " << final_arr[m][q] << "   ";
        }
```

```
            cout << endl;
        }
    } else {
        cout << "\nArrays are incompatible for multiplication! ";
    }
    return 0;
}
```

Homework Questions:

1:

```
#include <iostream>

using namespace std;

int main() {
    int size_arr_x, size_arr_y;
    cout << "Enter the size of the arrays (x,y): ";
    cin >> size_arr_x >> size_arr_y;
    int arr_A[size_arr_x][size_arr_y], arr_B[size_arr_x][size_arr_y],
arr_sum[size_arr_x][size_arr_y];
    cout << endl;

    for (int x = 0; x < size_arr_x; x++) {
        for (int y = 0; y < size_arr_y; y++) {
            cout << "Enter the value at A (" << x + 1 << ", " << y + 1 << "): ";
            cin >> arr_A[x][y];
        }
    }
```

```
    cout << endl;

    for (int x = 0; x < size_arr_x; x++) {
        for (int y = 0; y < size_arr_y; y++) {
            cout << "Enter the value at B (" << x + 1 << ", " << y + 1 << "): ";
            cin >> arr_B[x][y];
        }
    }

    for (int x = 0; x < size_arr_x; x++) {
        for (int y = 0; y < size_arr_y; y++) {
            arr_sum[x][y] = arr_A[x][y] + arr_B[x][y];
        }
    }
    cout << "\n\nSum of Arrays:\n";
    for (int x = 0; x < size_arr_y; x++) {
        for (int y = 0; y < size_arr_x; y++) {
            cout << "   " << arr_sum[x][y] << "   ";
        }
        cout << endl;
    }
    return 0;
}
```