

## CSC 112 Computer Programming I

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### Question 1 (20 points)

Show the output of each of only 4 of the following program segments:

<pre>for ( int n = 1; n &lt; 5; n++) {     for ( int c = 1; c &lt; 5; c++)         If ( n % 3 == 0 )             cout &lt;&lt; setw(2) &lt;&lt; '@';         else             if ( n % 3 == 1 )                 cout &lt;&lt; setw(2) &lt;&lt; '#';             else                 cout &lt;&lt; setw(2) &lt;&lt; n;      cout &lt;&lt; endl; }</pre>	
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<pre>float gpa[5] = {3.3, 2.5, 2.5, 3.7, 4.0} string name[5] = {"Ahmed", "Tarek", "Nour", "Dina", "Fady"}; float T; string NT; bool flag; do { flag = false;   for (int j = 0; j &lt; 4; j++)     If (gpa[j] &gt; gpa[j+1])     {         T = gpa[j];         gpa[j] = gpa[j+1];         gpa[j+1] = T;          NT = name[j];         name[j] = name[j+1];         name[j+1] = NT;         flag = true;     } } while (flag); cout &lt;&lt; "The New Class List: " &lt;&lt; endl; for ( int k = 0; k &lt; 5; k++ )     cout &lt;&lt; setw(10) &lt;&lt; name[k] &lt;&lt; setw(6) &lt;&lt; gpa[k] &lt;&lt; endl;</pre>	
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```

const int size = 5;
int num [size] = {5, 5, 9, 8, 3}, temp;
for ( int r = 1; r < size; r++)
    for ( int c = 0; c < (size - r); c++)
        if ( num [c+1] < num [c] )
            {
                temp      = num [ c ];
                num [ c ] = num [ c+1 ];
                num [ c+1 ]      = temp;
            }
cout << "The new List: " << endl;
for ( int c = 4; c >= 0; c-- )
    cout << num[c] << endl;

```

```

int AB [2][3] = { 5, 3, 9, 4, 22, 9}, S[2]
for ( int row = 0; row < 2; row++)
    {
        S[row] = AB[row][0]
        for ( int col = 1; col < 3; col++)
            if ( AB[row][col] < S[row] )
                S[row] = AB[row][col];
    }
cout << "The Final Content: " << endl;
for ( int row = 0; row < 2; row++)
    {
        for ( int col = 0; col < 3; col++)
            cout << setw (4) << AB[row][col];
        cout << setw(4) << S[row] << endl;
    }

```

```

int F[6] = {1, 1};
cout << setw(3) << 0 << setw(3) << F[0] << endl;
cout << setw(3) << 1 << setw(3) << F[1] << endl;

for (int k = 2; k < 6; k++)
{
    F[k] = F[k-1] + F[k-2];
    cout << setw(3) << k << setw(3) << F[k] << endl;
}

```

```

int B[3] = {5, 6, 8};
int sum;
for ( int c = 0; c < 3; c++)
{
    sum = 1;
    for ( int f = 2; f <= B[c] / 2; f++)
        if ( B[c] % f == 0 )
            sum += f;
    if ( B[c] == sum )
        cout << B[c] << endl;
}

```

**Question 2 (20 points)**

Write ***only the C++ nested loops*** to produce the following patterns:

```
#
2 3
# # #
2 3 4 5
# # # # #
2 3 4 5 6 7
# # # # # # #
2 3 4 5 6 7 8 9
```

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### **Question 3 (20 points)**

The following C++ program takes and stores the names and sales amount (an integer number between 0 and 100000) of each of ten salesman in each of the last five years. The program computes and stores the average sales of each salesman. The program displays each salesman's name, his/her five sales amounts and the computed average sales amount rounded to the nearest integer in a well organized formats. The program contains some missing parts that you have to complete.

```
#include <iostream>
#include <iomanip>
.....
using namespace std;

void main()
{
    // Declaration & creating arrays
    ..... name.....; // an array to store names of salesmen
    int sales .....; // an array to store sales amount of each salesman in each year
    ..... avg .....; // an array to store the average sales of each salesman as a real value
    ..... sum; // a variable to compute sum of five sales amounts
    cout << setiosflags ( ios :: fixed ) << setprecision(0);

    // Input
    for ( int row = .....; .....; .....; )
    {
        cout << "Enter name of salesman: ";
        cin >> .....;

        cout << "Enter the 5 sales amounts one-by-one: ";

        for ( int col = .....; .....; ..... )
            cin >> .....;
    }

    // Processing
    for ( int row = .....; .....; ..... )
    {
        sum = .....;
        for ( int col = .....; .....; ..... )
            sum = ..... + .....;

        avg..... = .....;
    }
}
```

```

// Ouput
for ( int c = 1; c <= 80; c++)
    cout << '=';
cout << endl;

cout << setw(10) << "Name" << setw(10) << "Sales 1" << setw(10) <<
"Sales 2" << setw(10) << "Sales 3" << setw(10) << "Sales 4" << setw(10) << "Sales 5"
setw(10) << "Average" << endl;

for ( int c = 1; c <= 70; c++)
    cout << '=';
cout << endl;

for ( int row = .....; .....; ..... )
{
    cout << setw(10) << name.....;

    for ( int col = .....; .....; ..... )
        cout << setw(10) << sales.....;
    cout << setw(10) << avg.....;

    cout << endl;

}

for ( int c = 1; c <= 70; c++)
    cout << '=';
cout << endl;

system("pause");

} // nd of main function

```