Programming Language (A 반) Lab. 2

2.1 Function to calculate the value of cosine(amp, freq, time, phase)

1) Design an algorithm for displaying a sine graph on console window.

- Function **cosine(amp, freq, time, phase)** calculate the value of A·cos(2π·f·t + θ), where A: amplitude, f: frequency, t: time, θ: phase

2) Write a C++ function, **cosine(amp, freq, time, phase)** that implements the designed algorithm to calculate the sine function. The program should use the library function of Visual C++.

2.2 Function to draw a graph on console window

1) Write an algorithm in pseudo code that displays a two-dimensional graph y = f(x) on console window. The graph shows '*' mark on the position of y = f(x). On the console window, y position is mapped in horizontal position, while x position is mapped in vertical position. The graph display shows value of x, value of y, and graph.

2) Write a C++ program to input the values of amplitude, frequency, phase, and to display the cosine graph on console window for time of 0 ~ 50.

```
input the Amplitude : 1
input the frequency : 1
input the phase_in_radian : 0
input the Start time : 0
input the End time : 1
```

```
     x      cos(x) value                              cos(x) graph
                          -1                                  0                                  1
                          ----------------------------------------------------------------------
    0.00         1.00                                      |                                   *
    0.05         0.95                                      |                                 *
    0.10         0.81                                      |                               *
    0.15         0.59                                      |                           *
    0.20         0.31                                      |                   *
    0.25         0.00                                      *
    0.30        -0.31                                *      |
    0.35        -0.59                           *           |
    0.40        -0.81                      *                |
    0.45        -0.95                  *                    |
    0.50        -1.00                *                      |
    0.55        -0.95                  *                    |
    0.60        -0.81                      *                |
    0.65        -0.59                           *           |
    0.70        -0.31                                *      |
    0.75        -0.00                                      *
    0.80         0.31                                      |                   *
    0.85         0.59                                      |                           *
    0.90         0.81                                      |                               *
    0.95         0.95                                      |                                 *
    1.00         1.00                                      |                                   *
```