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C++ Programming
Analog Clock

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Analog Clock

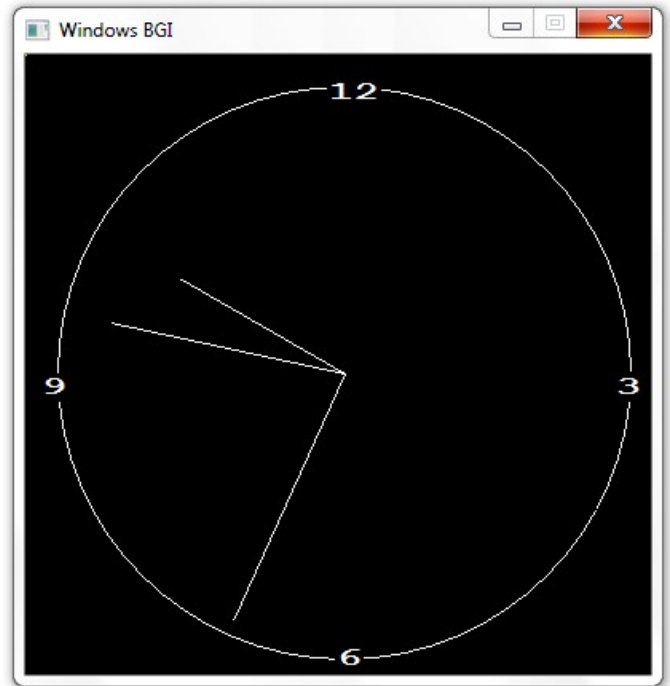
Design a C++ program that simulates an analog clock.

Your program should start by drawing a circle as the border of the clock.

You can use `outtextxy()` to place the numbers from 1 to 12.

You can draw the hour hand, minute hand and second hand.

Use the system time to get the correct time.



Help for Analog Clock

Libraries to Include

```
#include <iostream>
#include <ctime> // to get hours, minutes, seconds
#include <cmath> // for cos() and sin()
#include <winbgim.h> // for graphics
#include <windows.h> // for Sleep(milliseconds) functions
```

Variables and Constants

```
const double pi = 3.14159265358979323846;

int hours, minutes, seconds;
int hours_angle, minutes_angle, seconds_angle;
int hours_x, hours_y, minutes_x, minutes_y, seconds_x, seconds_y;
```

Draw Clock

```
circle(200,200,180);

// write the numbers 12, 3, 6, 9 on clock border
outtextxy(190, 15, "12");
outtextxy(370, 200, "3");
outtextxy(195, 370, "6");
outtextxy(10, 200, "9");
```

Get the System Time

```
time_t now = time(0);
tm *ltm = localtime(&now);

hours = ltm->tm_hour;
minutes = ltm->tm_min;
seconds = ltm->tm_sec;
```

Figure Out the Degrees for each Clock Hand

```
// Note: Adjust by 90 degrees since 0 for clock is at top, not right like on a graph
hours_angle = hours * 30 - 90;
minutes_angle = minutes * ___ - 90;
seconds_angle = seconds * ___ - 90;
```

Drawing the Hour Hand

```
// Notes:
// 1. Center of clock is at (200, 200)
// 2. Need to convert degrees to radians
// 3. Length of hour hand is 120

hours_x = 200 + 120 * cos(hours_angle * pi/180);
hours_y = 200 + 120 * sin(hours_angle * pi/180);

setcolor(15);
line(200, 200, hours_x, hours_y);
```