



RAJSHAHİ UNIVERSITY OF ENGINEERING & TECHNOLOGY
(RUET)

DEPARTMENT OF CSE

COURSE TITLE: SESSIONAL BASED ON CSE 4201

COURSE CODE: CSE 4202

Submitted to:

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Problem Statement:

Implementation of a Computer Graphics and Animations Project.

Summary:

This is a very small project attempt which portrays a river view scenery. Below the blue sky, a calm river spreads its cobalt shroud, its calm waves gently caressing the land. Above, a canvas of cotton-white clouds gently moves over the blue sky. At the horizon's edge, the sun, a radiant orb of golden fire, casts its warm embrace upon the world. In the sky, there are birds flying around. They're black and they flap their wings to fly. Next to the river, there are trees with green leaves. They stand tall and strong. The breeze causes the leaves to rustle, creating a gentle sound similar to a symphony.

For completing the project line, circle, ellipse drawing algorithm were used. For the clear shapes floodfill algorithm was also used. For creating a diversion like animated scene, window was cleared after each loop.

Source Code:

```
#include <graphics.h>
#include <stdlib.h>
#include <time.h>

#define NUM_CLOUDS 4
#define NUM_BIRDS 5

void drawCloud(int x, int y);
void drawRiver(int y);
void drawBird(int x, int y);
void drawSun(int x, int y, int radius);
void drawTrees(int river_y);

int main() {
    int gd = DETECT, gm;
    initgraph(&gd, &gm, "");

    int max_width = getmaxx();
    int max_height = getmaxy();
```

```

// sky color
setbkcolor(LIGHTBLUE);
cleardevice();
// clouds
srand(time(NULL));
int cloud_x[NUM_CLOUDS];
int cloud_y[NUM_CLOUDS];
for (int i = 0; i < NUM_CLOUDS; i++) {
    cloud_x[i] = rand() % max_width;
    cloud_y[i] = rand() % (max_height / 3);
}
// river
int river_y = max_height * 2 / 3;
drawRiver(river_y);
// sun
int sun_radius = 40; // Adjust sun size
int sun_x = max_width - sun_radius - 25;
int sun_y = sun_radius + 10;
drawSun(sun_x, sun_y, sun_radius);
// birds
int bird_x[NUM_BIRDS];
int bird_y[NUM_BIRDS];
for (int i = 0; i < NUM_BIRDS; i++) {
    bird_x[i] = rand() % max_width;
    bird_y[i] = rand() % (max_height / 2);
}
// Animation loop
while (!kbhit()) {
    // Clear previous frame
    cleardevice();
    // sky
    setbkcolor(LIGHTBLUE);
    cleardevice();
    // clouds
    for (int i = 0; i < NUM_CLOUDS; i++) {
        drawCloud(cloud_x[i], cloud_y[i]);
        cloud_x[i] += 1;

        if (cloud_x[i] > max_width) {
            cloud_x[i] = 0;
            cloud_y[i] = rand() % (max_height / 3);
        }
    }
    drawRiver(river_y);
    drawSun(sun_x, sun_y, sun_radius);
}

```

```

        for (int i = 0; i < NUM_BIRDS; i++) {
            drawBird(bird_x[i], bird_y[i]);
            bird_x[i] += 2;
            if (bird_x[i] > max_width) {
                bird_x[i] = 0;
                bird_y[i] = rand() % (max_height / 3);
            }
        }
        drawTrees(river_y);
        delay(25);
    }
    getch();
    closegraph();
    return 0;
}

void drawCloud(int x, int y) {
    setcolor(WHITE);
    setfillstyle(SOLID_FILL, WHITE);
    ellipse(x, y, 0, 360, 40, 20);
    floodfill(x, y, WHITE);
    ellipse(x + 20, y + 10, 0, 360, 40, 20);
    floodfill(x + 20, y + 10, WHITE);
    ellipse(x + 60, y, 0, 360, 40, 20);
    floodfill(x + 60, y, WHITE);
    ellipse(x + 80, y + 10, 0, 360, 40, 20);
    floodfill(x + 80, y + 10, WHITE);
    ellipse(x + 100, y, 0, 360, 40, 20);
    floodfill(x + 100, y, WHITE);
}

void drawRiver(int y) {
    setcolor(BLUE);
    rectangle(0, y, getmaxx(), getmaxy());
    setfillstyle(SOLID_FILL, BLUE);
    floodfill(1, y + 1, BLUE);

    int river_width = getmaxx();
    int num_lines = 20;
    for (int i = 0; i < num_lines; i++) {
        int line_y = y + rand() % (y / 3);
        line(0, line_y, river_width, line_y);
    }
}

```

```

void drawBird(int x, int y) {
    setcolor(BLACK);
    // body
    setfillstyle(SOLID_FILL, BLACK);
    line(x - 5, y, x, y + 5);
    line(x - 10, y, x + 5, y - 5);
    line(x, y + 5, x + 5, y - 5);
    floodfill(x - 2, y + 2, BLACK);
    // head
    setfillstyle(SOLID_FILL, BLACK);
    line(x + 3, y, x + 8, y - 2);
    line(x + 5, y, x + 8, y + 3);
    line(x + 7, y - 3, x + 8, y + 3);
    floodfill(x + 6, y, BLACK);
}

void drawSun(int x, int y, int radius) {
    setcolor(RED);
    setfillstyle(SOLID_FILL, RED);
    circle(x, y, radius);
    floodfill(x, y, RED);
}

void drawTrees(int river_y) {
    setcolor(GREEN);
    setfillstyle(SOLID_FILL, GREEN);
    int leaves_base_y = river_y - 4;
    for (int i = 0; i < 19; i++) {
        int leaves_x = i * 100;
        for (int j = 0; j < 15; j++) {
            int circle_y = leaves_base_y - 5;
            int circle_x = leaves_x + j * 20 + rand() % 6;
            circle(circle_x, circle_y, 10);
            floodfill(circle_x, circle_y, GREEN);
        }
    }
}

```

Output:

