Animation of a Moving Car using graphics.h in C

1 Objective

To create an animation of a moving car using graphics.h in C.

2 Theory

We have learned the basics of graphics.h in C. Using the concept of redrawing a frame multiple times in a loop with a delay adjusted for the human eye, we can create the simple animations such as a moving car implemented as below.

3 Algorithm

1. Initialize graphics using `initgraph()` function.
2. Start a loop that runs 500 times (adjust the loop count for desired animation duration).
3. Draw the road using `line()` function.
4. Draw the car using various shapes like rectangles, lines, and circles to represent different parts of the car.
5. Move the car horizontally by incrementing the x-coordinates of its components within the loop.
6. Add a delay using `delay()` function to control the animation speed.
7. Clear the screen using `cleardevice()` function to prepare for the next frame.
8. End the loop.

4 Source Code

```
#include "labs.h"
#include "definitions.h"

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

    while(1)
    {
        // lab5();
        car();
    }

    getch();
```

```
    closegraph();
    return 0;
}

void car()
{
    int car[][2] =
    {
        {0, 0},
        {0, 30},
        {-30, 30},
        {-30, 60},
        {-90, 60},
        {-90, 30},
        {-90, 30},
        {-120, 30},
        {-120, 0},
    };
    unsigned size = sizeof(car) / sizeof(car[0]);
    drawObject(size, car);
    int wheelCoords[] = { -30, 0, 10 };
    int wheelCoords2[] = { -90, 0, 10 };
    translateAxes(&wheelCoords[0], &wheelCoords[1]);
    translateAxes(&wheelCoords2[0], &wheelCoords2[1]);

    // draw road
    // translation stuff
    for(size_t i = 0; i < 200; i++)
    {
        cleardevice();
        translate(size, car, 1, 0);
        translateArr(1, wheelCoords, 1);
        translateArr(1, wheelCoords2, 1);
        circle(wheelCoords[0], wheelCoords[1], wheelCoords[2]);
        circle(wheelCoords2[0], wheelCoords2[1], wheelCoords2[2]);
        drawObject(size, car);
        line(0, HEIGHT / 2, WIDTH, HEIGHT / 2);
        line(0, HEIGHT / 2 + 30, WIDTH, HEIGHT / 2 + 30);
        delay(10);
    }
    delay(500);
}
```

5 Output

```
[jenishp@monika cg]$ make 2>/dev/null
./bin/main
```

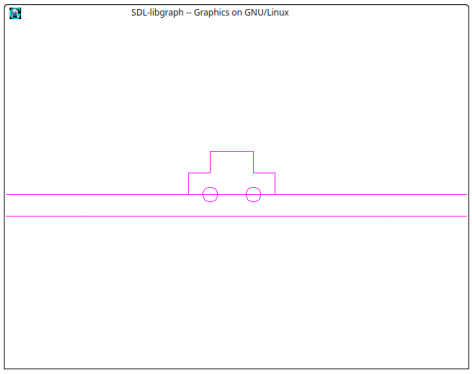

Figure 1: Initial State of the car

```
[jenishp@monika cg]$ make 2>/dev/null
./bin/main
```

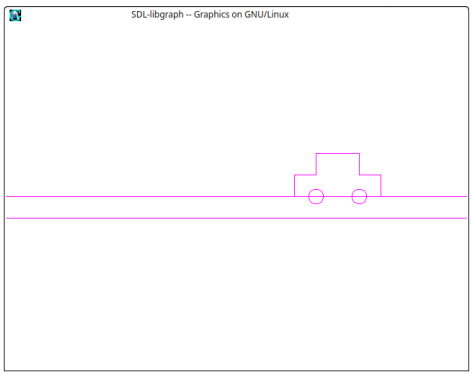

Figure 2: Final State of the car(After continuous translation)

6 Conclusion

We have successfully created an animation of a moving car using graphics.h in C. Using the functions and algorithms previously learned, we were able to create this simple animation. Using the same concept, we can create more complex animations and games.