```
 1: #include "planets.hpp"
 2:
 3: Body::Body() {}
 4:
 5: Vector2f Body::getPos() {
 6:     Vector2f pos(xVel, yVel);
 7:     return pos;
 8: }
 9:
10: double Body::getM() {
11:     return mass;
12: }
13:
14: void Body::scale(Vector2u winSize, double R) {
15:     this->winSize = winSize;
16:     this->R = R;
17: }
18:
19: void Body::draw(RenderTarget &target, RenderStates states) const {
20:     target.draw(sprite, states);
21: }
22:
23: istream &operator >>(istream &in, Body &body) {
24:     in >> body.x >> body.y >> body.xVel >> body.yVel
25:         >> body.mass >> body.img_file;
26:
27:     if (!body.texture.loadFromFile("nbody/" + body.img_file)) {
28:         cout << "Failed to load image " << body.img_file << endl;
29:         exit(EXIT_FAILURE);
30:     }
31:     body.sprite.setTexture(body.texture);
32:     return in;
33: }
34:
35: void Body::time(double time) {
36:     double ax = F.x / mass;
37:     double ay = F.y / mass;
38:
39:     setV(ax, ay, time);
40:
41:     setPos(time);
42: }
43:
44: void Body::setV(double ax, double ay, double time) {
45:     xVel -= (ax * time);
46:     yVel -= (ay * time);
47: }
48:
49: void Body::setPos(double time) {
50:     x -= xVel * time;
51:     y -= yVel * time;
52: }
53:
54: void Body::move() {
55:     double newX = ((x / R) * winSize.x/2) + winSize.x / 2;
56:     double newY = ((y / R) * winSize.y/2) + winSize.y / 2;
57:     Vector2f middle;
58:     middle.x = sprite.getTexture()->getSize().x / 2;
59:     middle.y = sprite.getTexture()->getSize().y / 2;
60:     sprite.setOrigin(middle);
61:
```

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    62:     sprite.setPosition(newX, newY);
    63: }
    64:
    65: double getRadius(double body1_pos, double body2_pos) {
    66:     return sqrt(pow(body1_pos, 2) + pow(body2_pos, 2));
    67: }
    68:
    69: double getForce(double mass1, double mass2, double r) {
    70:
    71:     return (G * mass1 * mass2) / pow(r, 2);;
    72: }
    73:
    74: double dirF(double F, double dF, double r) {
    75:     double fDir = F * dF / r;
    76:     return fDir;
    77: }
    78:
    79: Body::~Body() {}
```