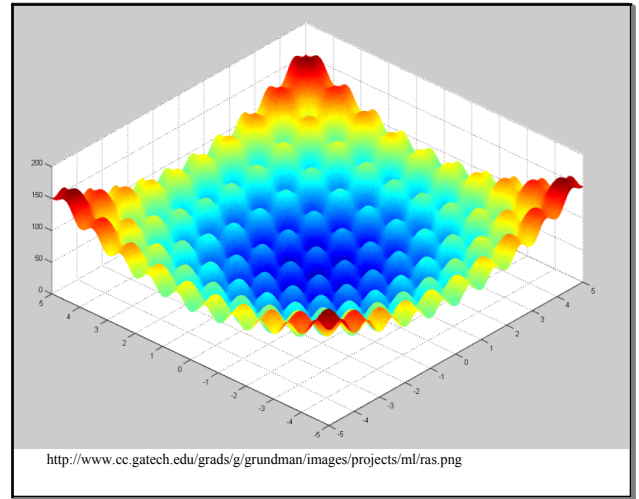


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```
public interface State extends Cloneable {
    void step();

    void undo(); ← 1 step back
    double energy(); ←

    Object clone(); ← copy state
}
```

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<http://cs.gettysburg.edu/~cpresser/cs371/hill/>

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```
public class Rastrigin implements State{
    public static final double STDDEV = 0.05;
    public static java.util.Random random = new java.util.Random();

    //instance variables
    public double x;
    public double y;
    public double prevX;
    public double prevY;

    public Rastrigin() {
        this(10, 10);
    } //end constructor

    public Rastrigin(double x, double y){
        this.x = x;
        this.y = y;
        prevX = x;
        prevY = y;
    } //end constructor (x, y)
}
```

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```
public void step(){
    prevX = x;
    prevY = y;
    x += STDDEV * random.nextGaussian();
    y += STDDEV * random.nextGaussian();
} //end step method

public void undo(){
    x = prevX;
    y = prevY;
} //end method undo

public double energy(){
    return x * x + y * y - Math.cos(18*x) - Math.cos(18*y) + 2;
} //end method energy
```

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```
public Object clone(){
    Rastrigin copy = new Rastrigin(x, y);
    copy.prevX = prevX;
    copy.prevY = prevY;
    return copy;
} //end method clone

public String toString(){
    return String.format("( %f, %f )", x, y);
} //end method toString
```

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