HW1

Roman Smirnov

4/6/2022

$$y = 2|x| - \pi, x \in [-\frac{pi}{2}, \frac{pi}{2}], y >= -\pi$$

$$y = |sin(2x)|, x \in [-\frac{pi}{2}, \frac{pi}{2}], y \in [0, 1]$$

Figure boundaries

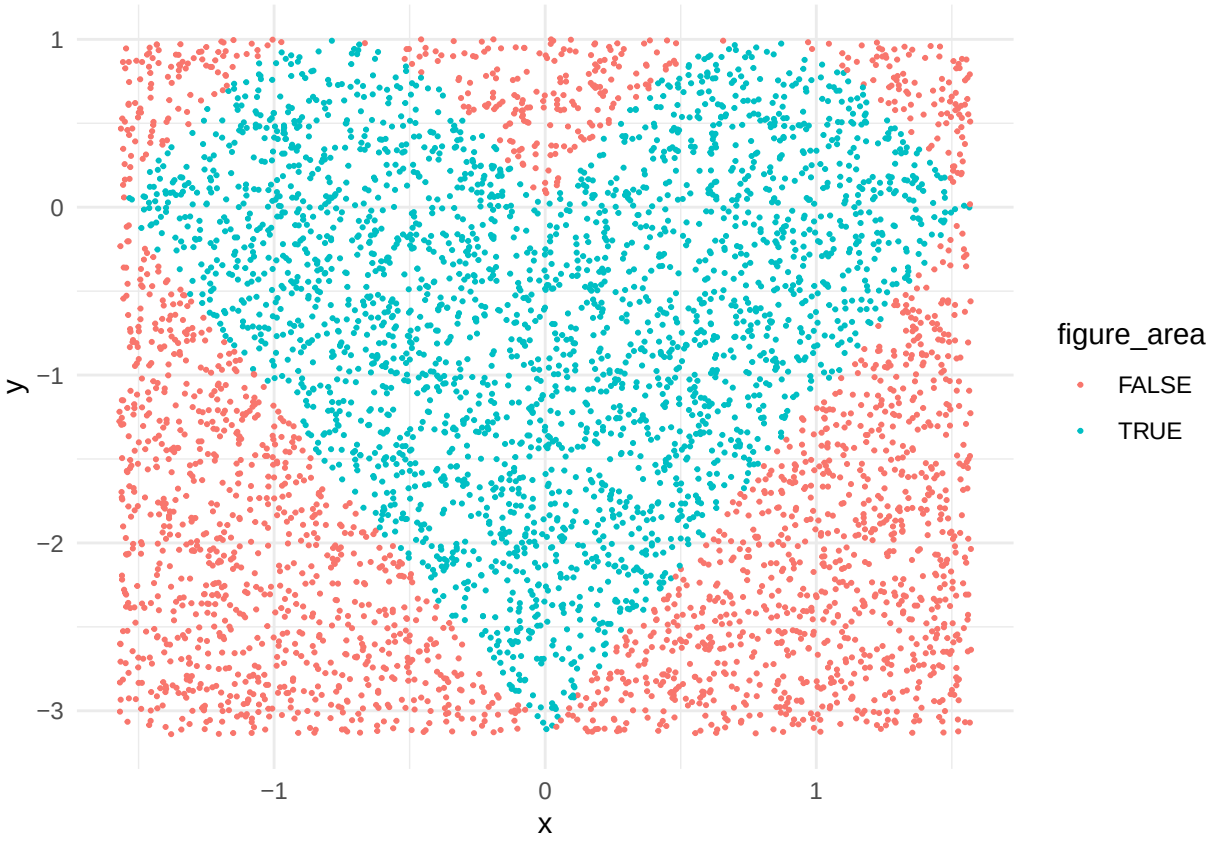
$$x \in [-\frac{pi}{2}, \frac{pi}{2}], y \in [-\pi, 1]$$

#1. Generate dataset of points:

```
##           x          y
## 1 -0.1932427  0.7966587
## 2 -0.4636543  0.1833529
## 3  1.3401670 -1.7328677
## 4  0.4495496 -2.3352109
## 5 -0.8400695 -0.3770298
## 6 -0.7358865 -1.0366159
```

Based on two equasions create a heart area

#2. Plot generated points:



#3. Based on this formula calculate the area of the figure:

$$S_{obj} = \frac{N_{in} * S_{Srec}}{N_t}$$

Sobj - area of an object Srec -area of a rectangle where the figure is located Nin - number of points inside the figure Nt - total number of points

```
## [1] 7.01824
```