First Racket Programming Assignment Solution

Learning Abstract

In this assignment I learned a little bit about numeric computations in Lisp. I also learned how to bind variables to values. I solved a couple of numeric problems by using basic arithmetic operations. And I learned to use a Racket library to create and display shapes so that I could render the problem situations graphically. All of this took place within the Interactions pane of the DrRacket PDE.

Interaction: Simple Numeric Processing

```
> 5
5
> 3.2
3.2
> (* 3 10)
30
> (+ 5 (* 2 3))
11
> (* 9 9 9 9 9 9 9 9 9 9 9 9)
2541865828329
>
```

Interaction: Solution to the Scrap Problem

The Scrap Problem: A circular disk of maximal size is cut from a square piece of tin of side 100 units. What is the area of the scrap?

```
> pi
3.141592653589793
> side
   side: undefined;
 cannot reference an identifier before its definition
> (define side 100)
> side
100
> (define square-area (* side side))
> square-area
10000
> (define radius (/ side 2))
> radius
50
> (define circle-area (* pi radius radius))
> circle-area
7853.981633974483
> (define scrap-area (- square-area circle-area))
> scrap-area
2146.018366025517
>
```

## Interaction: Illustration of Scrap Problem Situation

```
> (require 2htdp/image)
> (define side 100)
> (define radius (/ side 2))
> (define the-square (square side "solid" "gray"))
> (define the-circle (circle radius "solid" "white"))
> (define the-image (overlay the-circle the-square))
> the-image
```



```
> |
```

Interaction: Illustration of the Target Problem Situation

```
> (require 2htdp/image)
> (define (target size)
    (define bigC(circle size "solid" "red"))
    (define smallC (circle (*(/ size 4) 3) "solid" "blue"))
    (define center (circle (/ size 7) "solid" "red"))
    (define image (overlay center smallC bigC))
    image
    )
> (target 100)
```
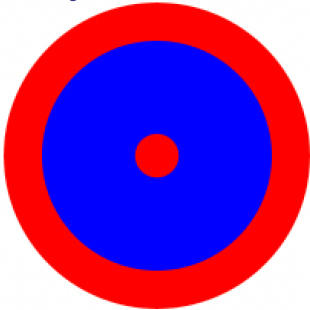

Interaction: Solution to Target Problem

```
> (define side 100)
> (define a (* pi side side))
> (define b (* pi (* .75 side) (* .75 side)))
> (define c (* pi (*(/ 1 7)side) (*(/ 1 7)side)))
> a
31415.926535897932
> b
17671.458676442588
> c
641.141357875468
> (/ (+ (- a b) c) a)
0.4579081632653061
```