Racket Programming Assignment #1: First Interactions

Learning Abstract

For this task, I began by installing Racket on my PC. Racket is a programming language and a multi-platform distribution that contains the Racket language, development tools, and a collection of further languages. I learnt some number computations in the first portion of this assignment. The second portion of the task, I replicated the answer to the question of locating the blue area of the tile. In the third section, I simulated the tile's computational drawing. I utilized what I nearly learned from lesson #1 to compute the size of the blue dots area and create the concentric disk for the final section. Even though we didn't employ any new functions, I found this assignment to be highly instructive. I could observe how Racket works by making pictures and performing simple arithmetic calculations.

Interaction: Simple Numeric Processing

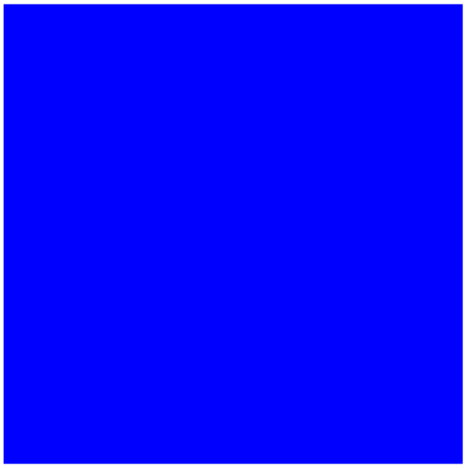
```
Welcome to DrRacket, version 8.6 [cs].
Language: Determine language from source; memory limit: 128 MB.
> x
x: undefined;
 cannot reference an identifier before its definition
> 55
55
> 55.2
55.2
> pi
3.141592653589793
> ( * 3 8 )
24
> ( + ( * 3 8 ) 6 )
30
> ( expt 2 8 )
256
> ( * pi ( expt 7 2 ) )
153.93804002589985
> ( expt 9 50 )
515377520732011331036461129765621272702107522001
>
```

Interaction: Solution to the blue and red tile area problem

```
Welcome to DrRacket, version 8.6 [cs].
Language: Determine language from source; memory limit: 128 MB.
> (define side-of-tile 200)
> (define diameter-of-dot ( / side-of-tile 3))
> (define radius-of-dot ( / diameter-of-dot 2))
> (define total-tile-area (expt side-of-tile 2))
> (define red-dot-area ( * pi (expt radius-of-dot 2)))
> (define blue-tile-area ( - total-tile-area red-dot-area))
> side-of-tile
200
> diameter-of-dot
66 2/3
> radius-of-dot
33 1/3
> total-tile-area
40000
> red-dot-area
3490.658503988659
> blue-tile-area
36509.341496011344
>
```

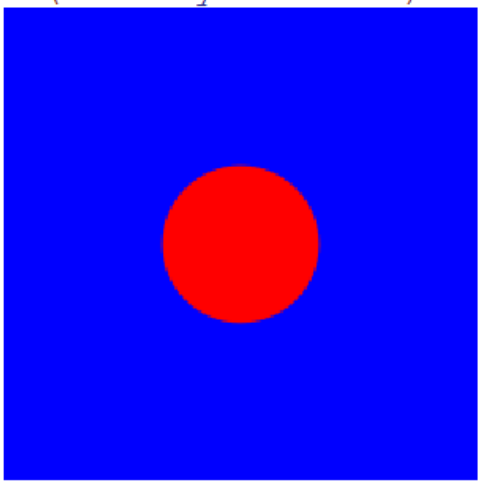
Interaction: Painting the blue and red tile

```
Welcome to DrRacket, version 8.6 [cs].
Language: racket, with debugging; memory limit: 128 MB.
> ( require 2htdp/image )
> ( define side-of-tile 200)
> ( define diameter-of-dot ( / side-of-tile 3 ) )
> ( define radius-of-dot ( / diameter-of-dot 2 ) )
> (define tile ( square side-of-tile "solid" "blue" ) )
> tile
```



```
> ( define dot ( circle radius-of-dot "solid" "red" ) )
> dot
```

```
> ( overlay dot tile )
```



```
>
```

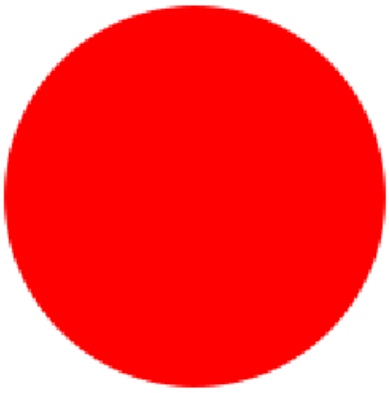
Interaction: Painting the blue and red concentric disks image

```
Welcome to DrRacket, version 8.6 [cs].
Language: racket, with debugging; memory limit: 128 MB.
> (require 2htdp/image)
> (define radius-of-dot1 20)
> (define radius-of-dot2 40)
> (define radius-of-dot3 60)
> (define radius-of-dot4 80)
> (define radius-of-dot5 100)
> (define dot1 (circle radius-of-dot1 "solid" "blue"))
> dot1
```

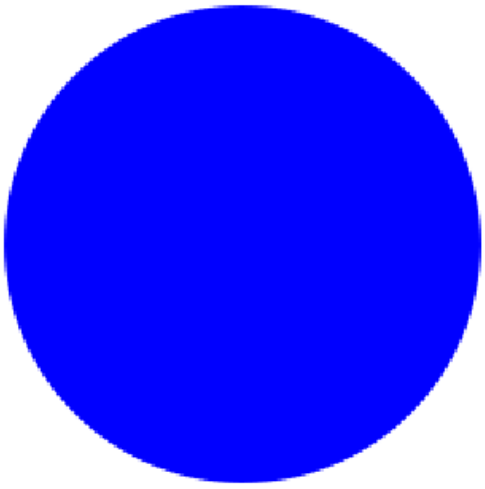
```
> (define dot2 (circle radius-of-dot2 "solid" "red"))
> dot2
```

```
> (define dot3 (circle radius-of-dot3 "solid" "blue"))
> dot3
```

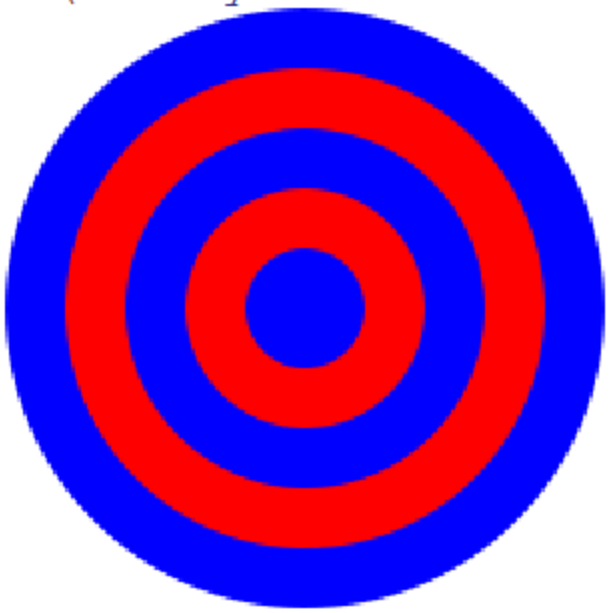
```
> (define dot4 (circle radius-of-dot4 "solid" "red"))
> dot4
```



```
> (define dot5 (circle radius-of-dot5 "solid" "blue"))
> dot5
```



```
> (overlay dot1 dot2 dot3 dot4 dot5)
```



```
>
```

Interaction: Computing the area of the concentric disks image which is blue

```
Welcome to DrRacket, version 8.6 [cs].
Language: racket, with debugging; memory limit: 128 MB.
> (define radius-of-dot1 20)
> (define radius-of-dot2 40)
> (define radius-of-dot3 60)
> (define radius-of-dot4 80)
> (define radius-of-dot5 100)
> (define blue-dot1-area ( * pi (expt radius-of-dot1 2)))
> (define red-dot2-area ( * pi (expt radius-of-dot2 2)))
> (define blue-dot3-area ( * pi (expt radius-of-dot3 2)))
> (define red-dot4-area ( * pi (expt radius-of-dot4 2)))
> (define blue-dot5-area ( * pi (expt radius-of-dot5 2)))
> (define only-blue-area ( - ( + blue-dot1-area blue-dot3-area
blue-dot5-area) red-dot2-area red-dot4-area))
```

```
> radius-of-dot1
20
> radius-of-dot2
40
> radius-of-dot3
60
> radius-of-dot4
80
> radius-of-dot5
100
> blue-dot1-area
1256.6370614359173
> red-dot2-area
5026.548245743669
> blue-dot3-area
11309.733552923255
> red-dot4-area
20106.192982974677
> blue-dot5-area
31415.926535897932
> only-blue-area
18849.55592153876
>
```