Racket Programming Assignment #1: First Interactions

Learning Abstract

This assignment takes a glimpse into the programming language of Racket. All that is seen is done through the interactions of DrRacket PDE. The first section is about the mathematical properties of Lisp. The second and third sections show a blue square encasing a red dot. The second section talks about using Racket programming to mathematically solve the blue square while the third section takes some of the details of the shapes and illustrates the blue square and red circle and overlaying the red circle on the blue square. The last 2 sections illustrate the mechanics of making 5 consecutive circles with interchanging colors. The fourth section shows the visual image while the fifth section goes over the calculation of the blue area. Throughout the assignment, the binding values to variables was the theme

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

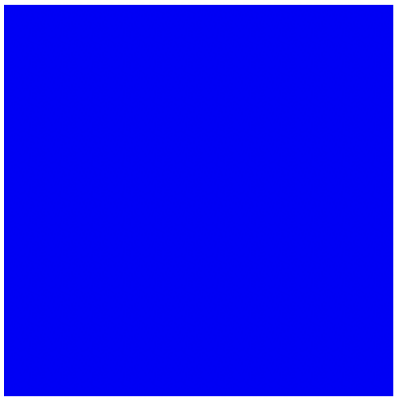
The blue and red tile area problem: A tile of side 200 is blue, except for a centered red disk of radius one-third the side of the tile. What is the area of the tile which is blue?

```
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
>
```

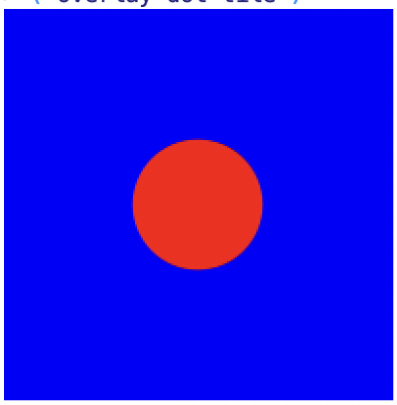
Interaction: Painting the blue and red tile

```
Welcome to DrRacket, version 8.6 [cs].
Language: Determine language from source; 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 )
```



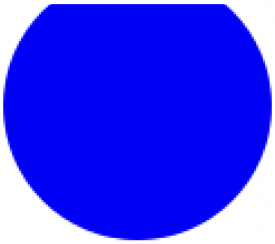
```
>
```

Interaction: Painting the blue and red concentric disks image

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

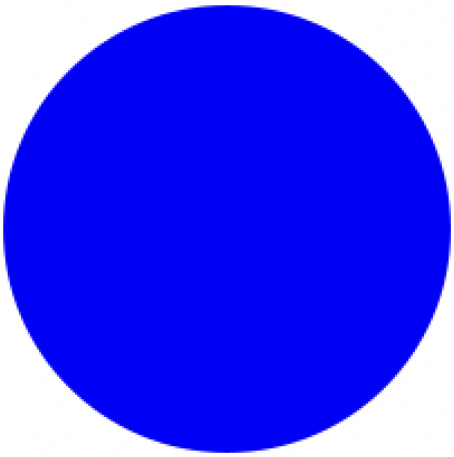
```
> ( define dot2 ( circle radius-of-dot2 "solid" "red" ) )
> dot2
```

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

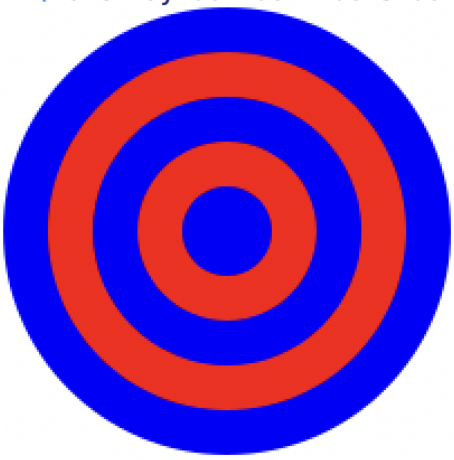


```
> ( define dot4 ( circle radius-of-dot4 "solid" "red" ) )
> dot4
```

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



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



```
>
```

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

```
Welcome to DrRacket, version 8.6 [cs].
Language: Determine language from source; memory limit: 128 MB.
> ( define radius-of-dot 20 )
> ( define radius-of-dot2 40 )
> ( define radius-of-dot3 60 )
> ( define radius-of-dot4 80 )
> ( define radius-of-dot5 100 )
> ( define circle-of-dot ( * pi ( expt radius-of-dot 2 ) ) )
> ( define circle-of-dot2 ( * pi ( expt radius-of-dot2 2 ) ) )
> ( define circle-of-dot3 ( * pi ( expt radius-of-dot3 2 ) ) )
> ( define circle-of-dot4 ( * pi ( expt radius-of-dot4 2 ) ) )
> ( define circle-of-dot5 ( * pi ( expt radius-of-dot5 2 ) ) )
> ( + ( - ( + ( - circle-of-dot5 circle-of-dot4 ) circle-of-dot3 ) circle-of-dot2 )
circle-of-dot1 )
 circle-of-dot1: undefined;
 cannot reference an identifier before its definition
> ( + ( - ( + ( - circle-of-dot5 circle-of-dot4 ) circle-of-dot3 ) circle-of-dot2 )
circle-of-dot)
18849.55592153876
>
```