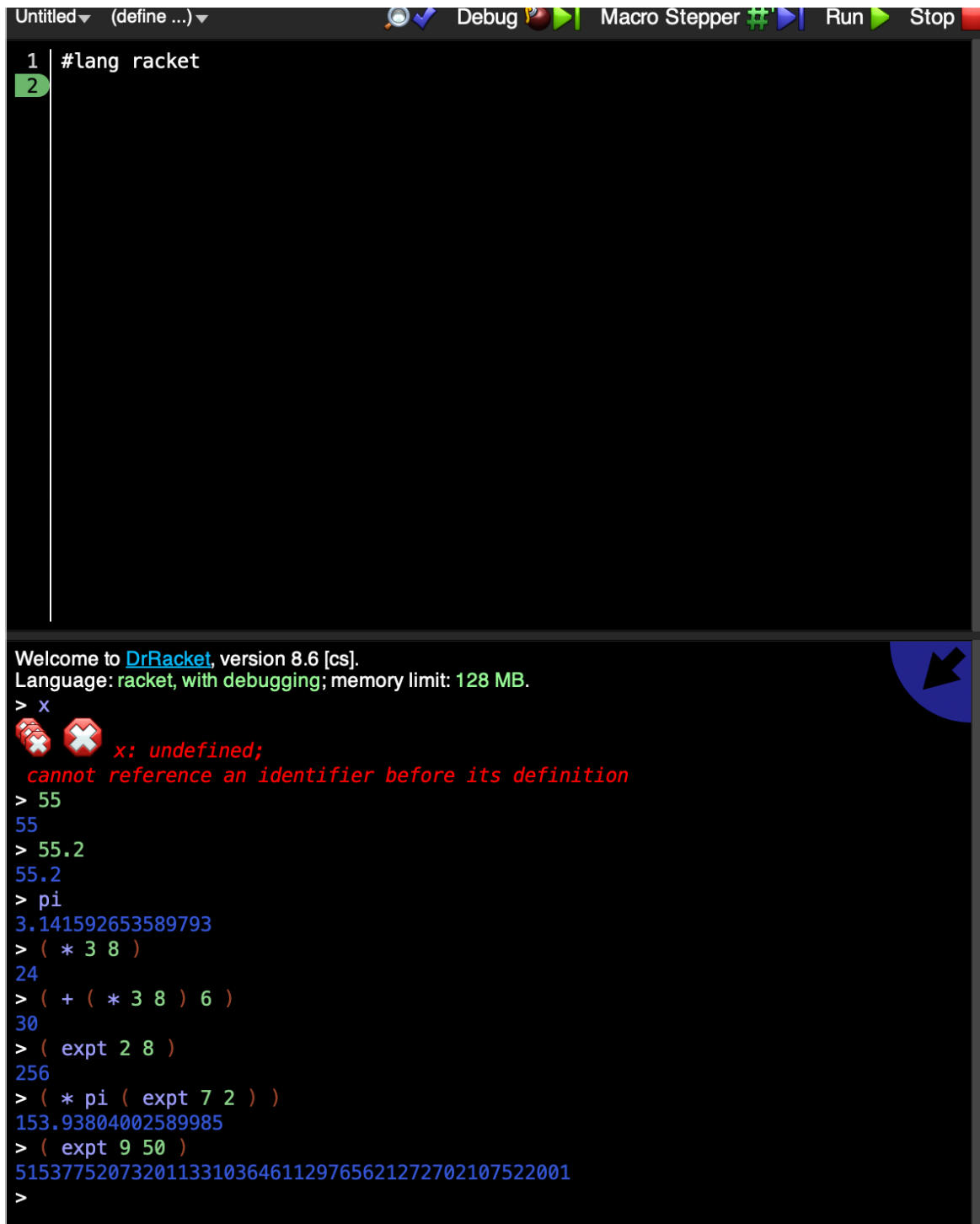


Racket Programming Assignment #1: First Interactions

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Learning Abstract: This assignment features simple programming methods and calculations in DrRacket. In this assignment I learned how to do simple numeric processing, as well as declaring variables to make everything compute how it should.

Simple Numeric Processing



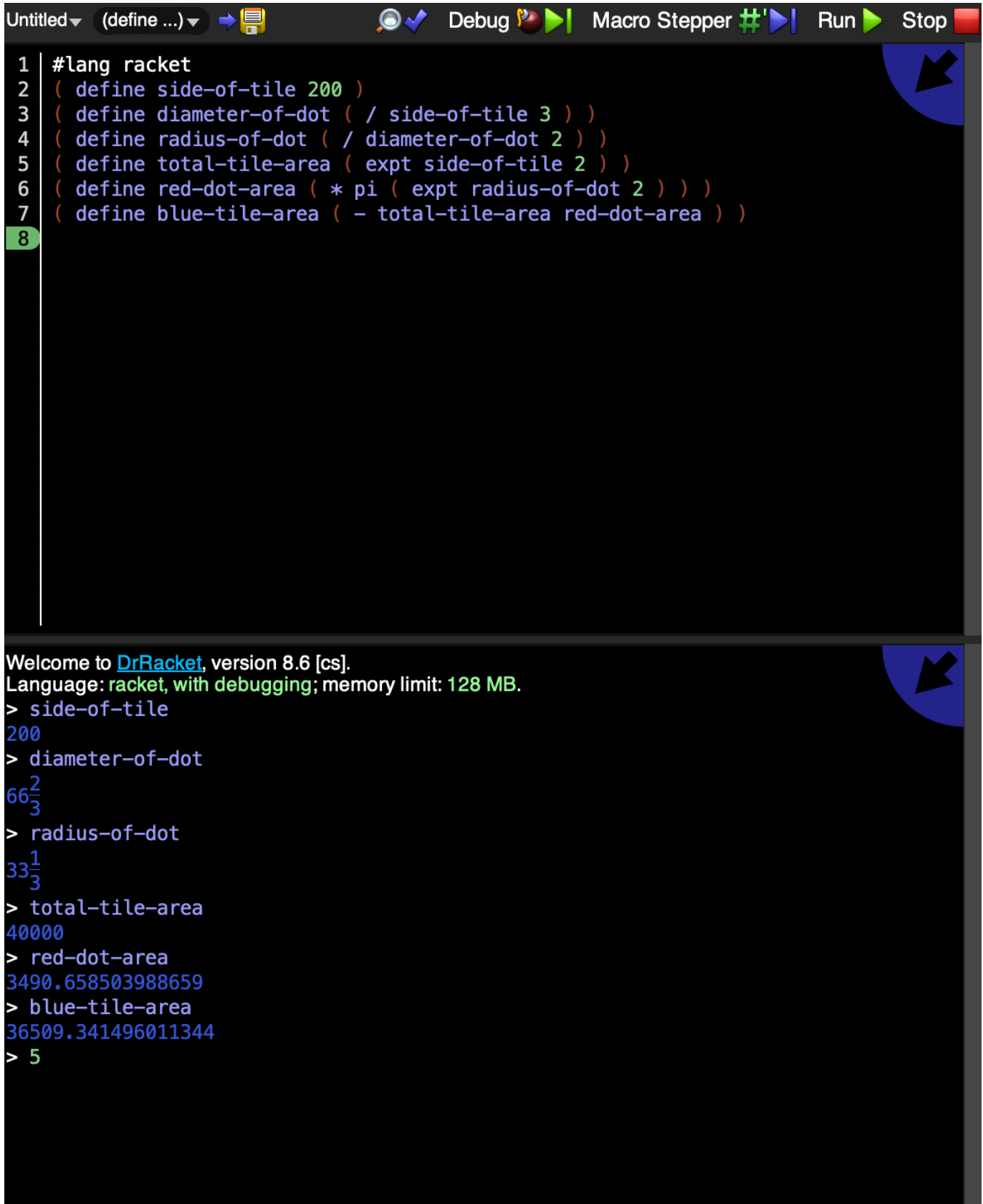
The screenshot shows the DrRacket IDE interface. The top toolbar includes buttons for Untitled, (define ...), Debug, Macro Stepper, Run, and Stop. The main editor area contains the following Racket code:

```
1 #lang racket
2
```

The bottom panel displays the Welcome message and the interaction history:

```
Welcome to DrRacket, version 8.6 [cs].
Language: racket, with debugging; 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
>
```

Solution to the blue and red tile area problem



The image shows a screenshot of the DrRacket IDE. The top pane contains a Racket program with the following code:

```
1 #lang racket
2 (define side-of-tile 200)
3 (define diameter-of-dot (/ side-of-tile 3))
4 (define radius-of-dot (/ diameter-of-dot 2))
5 (define total-tile-area (expt side-of-tile 2))
6 (define red-dot-area (* pi (expt radius-of-dot 2)))
7 (define blue-tile-area (- total-tile-area red-dot-area))
8
```

The bottom pane shows the welcome message and the results of the program's execution:

```
Welcome to DrRacket, version 8.6 [cs].
Language: racket, with debugging; memory limit: 128 MB.
> side-of-tile
200
> diameter-of-dot
66 $\frac{2}{3}$ 
> radius-of-dot
33 $\frac{1}{3}$ 
> total-tile-area
40000
> red-dot-area
3490.658503988659
> blue-tile-area
36509.341496011344
> 5
```

Painting the blue and red tile

```
Untitled ▾ (define ...) ▾ ➡ 📄 🔍 📌 Debug 🐛 ▶ Macro Stepper #' ▶ Run ▶ Stop 🛑
```

```
1 #lang racket
2 ( require 2htdp/image )
3 ( define side-of-tile 200 )
4 ( define diameter-of-dot ( / side-of-tile 3 ) )
5 ( define radius-of-dot ( / diameter-of-dot 2 ) )
6 ( define tile ( square side-of-tile "solid" "blue" ) )
7 ( define dot ( circle radius-of-dot "solid" "red" ) )
8
```

Language: racket, with debugging; memory limit: 128 MB.

```
> tile
```



```
> dot
```



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



Painting the blue and red concentric disks image

```
Untitled (define ...) [Icons] [Debug] [Macro Stepper] [Run] [Stop]

1 | #lang racket
2 | ( require 2htdp/image )
3 | ( define diameter-of-dot 200)
4 | ( define radius-of-dot ( / diameter-of-dot 2 ) )
5 | ( define dot ( circle radius-of-dot "solid" "blue" ) )
6 | (define diameter-of-dot1 160)
7 | ( define radius-of-dot1 ( / diameter-of-dot1 2 ) )
8 | ( define dot-1 ( circle radius-of-dot1 "solid" "red" ) )
9 | (define diameter-of-dot2 120)
10 | ( define radius-of-dot2 ( / diameter-of-dot2 2 ) )
11 | ( define dot-2 ( circle radius-of-dot2 "solid" "blue" ) )
12 | (define diameter-of-dot3 80)
13 | ( define radius-of-dot3 ( / diameter-of-dot3 2 ) )
14 | ( define dot-3 ( circle radius-of-dot3 "solid" "red" ) )
15 | (define diameter-of-dot4 40)
16 | ( define radius-of-dot4 ( / diameter-of-dot4 2 ) )
17 | ( define dot-4 ( circle radius-of-dot4 "solid" "blue" ) )

Welcome to DrRacket, version 8.6 [cs].
Language: racket, with debugging; memory limit: 128 MB.
> (overlay dot-4 (overlay dot-3 (overlay dot-2 (overlay dot-1 dot) ) ) )


```

Computing the area of the concentric disks image which is blue

```
total area.rkt ▾ (define ...) ▾  Debug  Macro Stepper  Run  Stop

1 #lang racket
2 ( define blue1r 100)
3 ( define blue1 ( * pi (expt blue1r 2 ) ) )
4 ( define red1r 80 )
5 ( define red1 ( * pi (expt red1r 2 ) ) )
6 ( define bigblue ( - blue1 red1 ) )
7 ( define blue2r 60 )
8 ( define blue2 ( * pi ( expt blue2r 2 ) ) )
9 ( define red2r 40 )
10 ( define red2 ( * pi (expt red2r 2 ) ) )
11 ( define medblue ( - blue2 red2 ) )
12 ( define blue3r 20)
13 ( define lilblue ( * pi ( expt blue3r 2 ) ) )
14 (define total-blue ( + bigblue medblue lilblue) )

Welcome to DrRacket, version 8.6 [cs].
Language: racket, with debugging; memory limit: 128 MB.
> total-blue
18849.55592153876
> |
```