

```
1 ;; make-point - Make a point that consists of an x and y component
2 (defn make-point [x y]
3   (list x y))
4
5 ;; x-coord - A selector for a point object's x coordinate
6 (defn x-coord [point]
7   (first point))
8
9 ;; y-coord - A selector for a Point object's y coordinate
10 (defn y-coord [point]
11   (second point))
12
13 ;; random-point - takes no arguments; returns a randomly generated Point with
14 ;; coordinates in the interval [0, 1]. See rand.
15 (defn random-point []
16   (make-point (rand) (rand)))
17
18 ;; throw-darts - Takes single argument n representing number of darts to
19 ;; throw. Generates a list of points of length n. Use "repeatedly" to generate an
20 ;; infinite sequence of random-point calls; use "take" on the result to collect
21 ;; only the first "n" results. (You can improve this by making the "throw-darts"
22 ;; function into "get-sample". Then replace the repeated function with an
23 ;; anonymous function)
24 (defn throw-darts [n]
25   (take n (repeatedly #(random-point))))
26
27 ;; Safe method of performing a squareroot (no imaginary numbers)
28 (defn sqrt [x]
29   (if (> x 0)
30     (Math/sqrt x)
31     0))
32
33 ;; is-hit? - takes a point representing a dart and returns if the dart hit the
34 ;; quarter circle. (Hint: calculate distance from the origin to the dart's
35 ;; coordinates, and decide if that distance means the dart lands inside or
36 ;; outside the quarter circle. Use selectors for Point's attributes)
37 (defn is-hit [point]
38   ;  $a^2 + b^2 = c^2$ 
39   ; if c is less than 1, true
40   (if (< (sqrt (+ (* (x-coord point) (x-coord point)) (* (y-coord point) (y-
41 coord point))))) 1)
42     1
43     0)
44 )
45
46 ;; count-hits - takes single argument n representing how many darts to "throw"
47 ;; and counts the number of darts that hit correctly.
48 (defn count-hits [n]
49   (reduce
50     +
51     (map #(is-hit %) (throw-darts n))
52     )
53 )
54
55 ;; estimate-pi - takes single parameter n, uses "count-hits" and correct math
56 ;; to estimate the value of pi
57 (defn estimate-pi [n]
58   (float (* (/ (count-hits n) n) 4)))
59 )
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