

#|

Fi| |rst Racket Homework

Rodrigo Benavente García

21/08/21

|#

#lang racket

(define (is-triangle a b c);We receive three sides

(cond

[(or (<= a 0) (<= b 0) (<= c 0)) #f];We check if at least one length is less or equal to 0

[(and

(> (+ a b) c);first condition

(> (+ b c) a);second condition

(> (+ c a) b);third condition

) #t];We check all the other conditions to see if it's a triangle

[else #f]

)

);end of my first exercise

(define (triangle-type a b c);second exercise, we receive three sides

(cond ;This condition helps me check if the sides belong to a triangle

[(is-triangle a b c);Runs function to check if it's a triangle

(cond

[(= a b c)'EQUILATERAL];Checks if it's an equilateral triangle

[(or (= a b) (= b c) (= c a)) 'ISOSCELES];Checks if it's an isosceles triangle

[else 'SCALENE];Checks if it's a scalene triangle

);End of my second condition

```

]
[else 'INVALID];Sides don't belong to a triangle
);End of my condition
);end of my second exercise

```

(define (point-quadrant x y);Third exercise, we receive the coordinates of a point in 2d

```

(if (and (> x 0) (> y 0)); Checks if x and y belong to the first quadrant
    'I
    (if (and (< x 0) (> y 0));Checks if x and y are in the second quadrant
        'II
        (if (and (< x 0) (< y 0));Checks if x and y are in the third quadrant
            'III
            (if (and (> x 0) (< y 0));Checks if x and y are in the fourth quadrant
                'IV
                (if (and (> x 0) (= y 0));Checks if x and y are in the x axis
                    'X_AXIS
                    (if (and (> y 0) (= x 0));Checks if x and y are in the y axis
                        'Y_AXIS
                        'ORIGIN
                    );End of 6th if
                ); End of 5th if
            );End of 4th if
        );End of third if
    );End of second if
)
);End of my third exercise

```

(define (parking-ticket hours minutes status);Fourth exercise, we receive #hours #mins and the status of the ticket

(cond ;Cond to check the status of the ticket

[(equal? status 'LOST) 100];If the user lost the ticket then we charge 100

[(equal? status 'STAMPED)

(cond ;Condition created to see how much to charge if the ticket is stamped

[(and (= hours 0) (= minutes 0)) 0];Charge 0 if the car didn't park there

[(or (and (<= hours 2)(< minutes 1)) (< hours 2)) 5];If the ticket is stamped and is parked for less than 2 hours

[(or (and (= hours 2)(> minutes 1)) (and (<= hours 3)(< minutes 1))) (+ 5 12)];Less than 3 hours and 2 hours with a fraction

[(and (>= hours 3) (< minutes 1)) (+ (* (- hours 2) 12) 5)];There are 3 or more hours and no minutes

[(and (>= hours 3) (and (>= minutes 1) (<= minutes 15))) (+ (* (- hours 2) 12) 5 5)];There are 3 or more hours and less or 15 mins

[(and (>= hours 3) (and (>= minutes 1) (<= minutes 30))) (+ (* (- hours 2) 12) 5 5 3)];There are 3 or more hours and less or 30 mins and more than 15 mins

[(and (>= hours 3) (and (>= minutes 1) (<= minutes 45))) (+ (* (- hours 2) 12) 5 5 3 2)];There are 3 or more hours and less or 45 mins and more than 30 mins

[(and (>= hours 3) (and (>= minutes 1) (<= minutes 59))) (+ (* (- hours 2) 12) 5 5 3 2 2)];There are 3 or more hours and less or 60 mins and more than 45 mins

]);End of STAMPED status

[(equal? status 'UNSTAMPED)

(cond ;Condition created to see how much to charge if the ticket is unstamped

[(and (= hours 0) (= minutes 0)) 12];Charge 12 because the ticket is unstamped

[(or (and (<= hours 1)(< minutes 1)) (and (= hours 0)(> minutes 1))) 12];Charge 12 for an hour or less

[(and (>= hours 1) (< minutes 1)) (+ (* hours 12))];There are 1 or more hours and no minutes

[(and (>= hours 1) (and (>= minutes 1) (<= minutes 15))) (+ (* hours 12) 5)];There are 1 or more hours and less or 15 mins

[(and (>= hours 1) (and (>= minutes 1) (<= minutes 30))) (+ (* hours 12) 5 3)];There are 1 or more hours and less or 30 mins

[(and (>= hours 1) (and (>= minutes 1) (<= minutes 45))) (+ (* hours 12) 5 3 2)];There are 1 or more hours and less or 45 mins

[(and (>= hours 1) (and (>= minutes 1) (<= minutes 59))) (+ (* hours 12) 5 3 2 2)];There are 1 or more hours and less or 60 mins

)];End of UNSTAMPED status

)

);End of my fourth exercise