
Algorithm 1 Calculate tangent Function using sin function

Require: value: $-\infty < x < \infty$ **Ensure:** $result = \tan(x)$

```
1: procedure CALCULATEPOWER(base, exponent)
2:   power  $\leftarrow$  1
3:   for  $i \leftarrow 1, exponent$  do
4:     power  $\leftarrow$  power * base
5:   end for
6:   return power ▷ It returns the base to the power exponent
7: end procedure

8: procedure CALCULATEFACTORIAL(exponent)
9:   fact  $\leftarrow$  1
10:  for  $i \leftarrow 1, exponent$  do
11:    fact  $\leftarrow$  fact * i
12:  end for
13:  return fact ▷ It returns the factorial of exponent
14: end procedure

15:  $n \leftarrow \frac{x \cdot 3.14}{180}$ 
16:  $s \leftarrow 0$ 
17: flag  $\leftarrow$  true
18: double  $\leftarrow$  output
19: for  $i \leftarrow 1, 99$  do
20:   if  $i2 \leftarrow !0$  then
21:     if flag  $\leftarrow$  true then
22:       output  $\leftarrow$  output +  $\frac{power(n,i)}{factorial(i)}$ 
23:       flag  $\leftarrow$  false
24:     else
25:       output  $\leftarrow$  output -  $\frac{power(n,i)}{factorial(i)}$ 
26:       flag  $\leftarrow$  true
27:     end if
28:   else
29:     return 0
30:   end if
31: end for
32: s  $\leftarrow$  output

33:  $c \leftarrow \sqrt{1 - s^2}$ 
    $t \leftarrow \frac{s}{c}$ 
```

Algorithm 2 Calculate tangent Function using sin and cos function

Require: value: $-\infty < x < \infty$ **Ensure:** $result = \tan(x)$

```
1: procedure CALCULATEPOWER(base, exponent)
2:   power  $\leftarrow$  1
3:   for  $i \leftarrow 1, exponent$  do
4:     power  $\leftarrow$  power * base
5:   end for
6:   return power ▷ It returns the base to the power exponent
7: end procedure

8: procedure CALCULATEFACTORIAL(exponent)
9:   fact  $\leftarrow$  1
10:  for  $i \leftarrow 1, exponent$  do
11:    fact  $\leftarrow$  fact * i
12:  end for
13:  return fact ▷ It returns the factorial of exponent
14: end procedure

15: procedure CALCULATESIN(n)
16:  s  $\leftarrow$  0
17:  flag  $\leftarrow$  true
18:  double  $\leftarrow$  output
19:  for  $i \leftarrow 1, 99$  do
20:    if flag  $\leftarrow$  true then
21:      output  $\leftarrow$  output +  $\frac{power(n,i)}{factorial(i)}$ 
22:      flag  $\leftarrow$  false
23:    else
24:      output  $\leftarrow$  output -  $\frac{power(n,i)}{factorial(i)}$ 
25:      flag  $\leftarrow$  true
26:    end if
27:  end for
28:  sin  $\leftarrow$  output
29:  return s ▷ It returns the value of sin
30: end procedure

31: procedure CALCULATECOSIN(n)
32:  c  $\leftarrow$  0
33:  flag  $\leftarrow$  true
34:  double  $\leftarrow$  output2
35:  for  $i \leftarrow 1, 99$  do
36:    if  $i2 \leftarrow 0$  then
37:      if flag  $\leftarrow$  true then
38:        output2  $\leftarrow$  output2 +  $\frac{power(n,i)}{factorial(i)}$ 
39:        flag  $\leftarrow$  false
40:      else
41:        output2  $\leftarrow$  output2 -  $\frac{power(n,i)}{2^{factorial(i)}}$ 
42:        flag  $\leftarrow$  true
43:      end if
44:    else
45:      return 0
46:    end if
47:  end for
48:  c  $\leftarrow$  output2
49:  return c ▷ It returns the value of cos
50: end procedure

51:  $n \leftarrow \frac{x \cdot 3.14}{180}$ 
52:  $t \leftarrow \frac{s}{c}$ 
```