Infinity_in_Python

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0.1 Ways infinty can be reprsented in python

1. Using `float('inf')` and `float('-inf')`

[1]:
```
# Defining a positive infinite integer
positive_infinity = float('inf')
print('Positive Infinity: ', positive_infinity)

# Defining a negative infinite integer
negative_infinity = float('-inf')
print('Negative Infinity: ', negative_infinity)
```

```
Positive Infinity:  inf
Negative Infinity:  -inf
```

2. Using `Math` module

[2]:
```
import math

# Defining a positive infinite integer
positive_infinity = math.inf
print('Positive Infinity: ', positive_infinity)

# Defining a negative infinite integer
negative_infinity = -math.inf
print('Negative Infinity: ', negative_infinity)
```

```
Positive Infinity:  inf
Negative Infinity:  -inf
```

3. Using `Decimal` module

[3]:
```
from decimal import Decimal

# Defining a positive infinite integer
positive_infinity = Decimal('Infinity')
print('Positive Infinity: ', positive_infinity)

# Defining a negative infinite integer
negative_infinity = Decimal('-Infinity')
```

```
print('Negative Infinity: ', negative_infinity)
```

```
Positive Infinity:  Infinity
Negative Infinity:  -Infinity
```

4. Using Numpy module

[4]:
```
import numpy as np

# Defining a positive infinite integer
positive_infinity = np.inf
print('Positive Infinity: ', positive_infinity)

# Defining a negative infinite integer
negative_infinity = -np.inf
print('Negative Infinity: ', negative_infinity)
```

```
Positive Infinity:  inf
Negative Infinity:  -inf
```

0.2 Checking if a number is infinite in Python

To check whether the given number is infinite or not, we can use the math module's `isinf()` function. It returns a boolean value which means if the given number is infinite it returns true and returns false if the number is not.

[5]:
```
import math

# Defining a positive infinite integer
positive_infinity = float('inf')
print('Positive Infinity: ', positive_infinity)
print('The variable is infinity = ',math.isinf(positive_infinity))

# Defining a negative infinite integer
negative_infinity = float('-inf')
print('Negative Infinity: ', negative_infinity)
print('The variable is infinity = ',math.isinf(negative_infinity))
```

```
Positive Infinity:  inf
The variable is infinity =  True
Negative Infinity:  -inf
The variable is infinity =  True
```

We can also verify that if positive and negative infinity are same or not

[6]:
```
print('Positive infinity equal to Negative infinity: ',positive_infinity ==␣
  ↪negative_infinity)
```

```
Positive infinity equal to Negative infinity:  False
```

Positive infinity number is **greatest**, and the negative infinity number is the **smallest** of all numbers. Lets verify this with an program

[8]:
```
if 99999999999999999 > positive_infinity:
    print('Numer is greater than Positive infinity')
else:
    print('Positive infinity is greater')

if -99999999999999999 < negative_infinity:
    print('Numer is smaller than Negative infinity')
else:
    print('Negative infinity is smaller')
```

```
Positive infinity is greater
Negative infinity is smaller
```

0.3 Arithmetic operations on infinity number will give an infinite number

Any arithmetic operations performed on an infinite value will give an infinite value be it addition, subtraction, multiplication or division, etc.

[9]:
```
print('Arithmatic operation on Positive infinity: ')
# Multiply Positive infinity number by 5
print('Multiplication : ',positive_infinity * 5)

# Addition to Positive infinity Number
print('Addition : ',positive_infinity + 5)

# Subtraction to Positive infinity Number
print('Subtraction : ',positive_infinity - 5)

# Division to Positive infinity Number
print('Division : ',positive_infinity / 5)

print('Arithmatic operation on Negative infinity: ')
# Multiply Negative infinity number by 5
print('Multiplication : ',negative_infinity * 5)

# Addition to Negative infinity Number
print('Addition : ',negative_infinity + 5)

# Subtraction to Negative infinity Number
print('Subtraction : ',negative_infinity - 5)

# Division to Negative infinity Number
print('Division : ',negative_infinity / 5)
```

```
Arithmatic operation on Positive infinity:
Multiplication :  inf
```

```
Addition :  inf
Subtraction :  inf
Division :  inf
Arithmatic operation on Negative infinity:
Multiplication :  -inf
Addition :  -inf
Subtraction :  -inf
Division :  -inf
```

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