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# -*- coding: utf-8 -*-
"""
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@title: Examples with p-adic calculations
"""

import p_adic

x = 25

# p_adic_val() function returns the p-adic absolute value of a given number.

x_p2 = p_adic.p_adic_val(x, p_num=2)

print("2-adic absolute value of ", x, " is ", x_p2)
2-adic absolute value of  25  is  1

x_p3 = p_adic.p_adic_val(x, p_num=3)

print("3-adic absolute value of ", x, " is ", x_p3)
3-adic absolute value of  25  is  1

x_p5 = p_adic.p_adic_val(x, p_num=5)

print("5-adic absolute value of ", x, " is ", x_p5)
5-adic absolute value of  25  is  0.04

y = 16

y_p2 = p_adic.p_adic_val(y, p_num=2)

print("2-adic absolute value of ", y, " is ", y_p2)
2-adic absolute value of  16  is  0.0625

# p_adic_pow_val() function returns both the p-adic order and the p-adic
absolute value of the given number.

y_p2_ord, y_p2_val = p_adic.p_adic_ord_val(y, p_numb=2)

print(y_p2_ord)
4

print(y_p2_val)
0.0625
```

```
y_p3 = p_adic.p_adic_val(y, p_num=3)

print("3-adic absolute value of ", y, " is ", y_p3)
3-adic absolute value of  16  is  1

y_p5 = p_adic.p_adic_val(y, p_num=5)

print("5-adic absolute value of ", y, " is ", y_p5)
5-adic absolute value of  16  is  1

z = -16

z_p = p_adic.p_adic_val(z, p_num=5)

print("5-adic absolute value of ", z, " is ", z_p)
5-adic absolute value of  -16  is  1

t = 0

print("2-adic absolute value of ", t, " is ", p_adic.p_adic_val(t, p_num=2))
2-adic absolute value of  0  is  0

print("3-adic absolute value of ", t, " is ", p_adic.p_adic_val(t, p_num=3))
3-adic absolute value of  0  is  0

print("5-adic absolute value of ", t, " is ", p_adic.p_adic_val(t, p_num=5))
5-adic absolute value of  0  is  0

print("17-adic absolute value of ", t, " is ", p_adic.p_adic_val(t,
p_num=17))
17-adic absolute value of  0  is  0

p = 1

print("2-adic absolute value of ", p, " is ", p_adic.p_adic_val(p, p_num=2))
2-adic absolute value of  1  is  1

print("3-adic absolute value of ", p, " is ", p_adic.p_adic_val(p, p_num=3))
3-adic absolute value of  1  is  1

print("5-adic absolute value of ", p, " is ", p_adic.p_adic_val(p, p_num=5))
5-adic absolute value of  1  is  1

print("17-adic absolute value of ", p, " is ", p_adic.p_adic_val(p,
p_num=17))
17-adic absolute value of  1  is  1

r1 = -54

print("3-adic absolute value of ", r1, " is ", p_adic.p_adic_val(r1,
p_num=3))
3-adic absolute value of  -54  is  0.037037
```

```
s = -(24/16)

print("2-adic absolute value of ", s, " is ", p_adic.p_adic_val(s, p_num=2))
2-adic absolute value of  -1.5  is  2

print(p_adic.p_adic_ord_val(s, p_numb=2))
(-1, 2)

s1 = 8

print(p_adic.p_adic_ord_val(s1, p_numb=2))
(3, 0.125)

s2 = 100

print(p_adic.p_adic_ord_val(s2, p_numb=5))
(2, 0.04)

s3 = 0.270

print(p_adic.p_adic_ord_val(s3, p_numb=3))
(3, 0.037037)

s4 = 0.270

print(p_adic.p_adic_ord_val(s4, p_numb=5))
(-2, 25)

# p-parameter of p_adic_val() function must be prime!

m = 16

print(p_adic.p_adic_val(m, p_num=4))
p should be a prime number!
None
```