Programming exercises 1

Write a function called repeater(s1, s2, n) that given two strings s1 and s2 and an integer n **returns** a string that starts with an underscore, then s1 and s2 alternate n times, then ends with an underscore. (For those who know loops: you may not use loops to solve this questions.)

Testing your code:

Here is what the output of your function should look like when you make the following function calls:

```
>>>
>>> repeater("AAA", "x", 3)
'_AAAxAAAxAAAx_'
>>> repeater("+", "--", 30)
'_+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--_'
>>> repeater("T", "|_|", 100)
'_T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|
T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|
_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|
T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|T|_|_'
>>>
```

Programming exercises 2

Read the first paragraph of this page on quadratic equation and finding its roots (it. solutions)

https://en.wikipedia.org/wiki/Quadratic_equation

Write a function called roots(a, b, c) that given three coefficients a and b and c **prints** a nicely formatted message displaying the equation and its two roots (the two roots may be the same number). You may assume that a is a non zero number, and that a and b and c are such that b^2-4ac is a positive number. (Do you know why we are making this assumption?)

```
>>>
>>> roots(-1, 4, 1.5)
The quadratic equation with coefficients a = -1 b = 4 c = 1.5
has the following solutions (i.e. roots):
-0.345207879911714 87  and 4.345207879911715
>>> roots(1, 2, 1)
The quadratic equation with coefficients a = 1 b = 2 c = 1
has the following solutions (i.e. roots):
-1.0  and -1.0
```

Programming exercises 3

Think back on the previous question …

Write a function called real_roots(a, b, c) that **returns** True if the quadratic equation with the given three coefficients a and b and c has real roots. Otherwise it returns False.

Recall that roots of a quadratic equation are real if and only if b^2-4ac is a non-negative number. (Do not use if statements nor loops)

Testing your code:

```
>>>
>>> real_roots(-1, 4, 1.5)
True
>>> real_roots(1, 2, 1)
True
>>> real_roots(1, 1, 1)
False
>>>
```

Programming exercises 4

Write a function called reverse(x) that given a two digit positive integer x **returns** the number with reversed digits. (You may assume that x is a two digit positive integer). (Do not use if statements nor loops)

Hints: Think of mod and div operators and how they can help. What number should you div x with to get the 1st digit.

Testing your code:

```
>>>
>>> reverse(27)
72
>>> reverse(44)
44
>>> reverse(19)
91
>>>
```