1. What is recursion?

2. What is a base case?

3. What is the output of the following code?

```python
def downup(s):
    if len(s) <= 1:
        print(s)
    else:
        print(s)
        downup(s[:-1])
        print(s)

downup('hello')
```

4. Label the base case and recursive case in the above function.
5. Write a non-recursive function `downup_not_recursive` that prints the same pattern as #3:

6. What are the steps in writing a recursive function?

1.

2.

3.

   i.

   ii.

   iii.
7. Write a new recursive version of the function in #3, `downup_return`, that returns the pattern.

8. Write a recursive function to compute factorials. Recall that the factorial of $n$ is the product of the integers from 1 to $n$:

$$n! = n \times (n - 1) \times (n - 2) \times \cdots \times 2 \times 1$$
9. Write a recursive function `count_e` that takes a string `s` and returns the number of times `'e'` occurs in `s`.

10. Write a recursive function `reverse` that takes a string `s` and returns the string in reverse.