Specification and Verification I

If $C$ is a command that contains one or more occurrences of a command `BREAK`, then `LOOP (C)` is a command that repeatedly executes $C$ until a `BREAK` is executed. Executing `BREAK` immediately terminates the execution of `LOOP (C)`.

How might ideas from Floyd–Hoare Logic be used to verify programs that use the `LOOP/BREAK` construct, such as the following program that sets the variable `RES` to the factorial of the initial value of the variable `X` (if $X > 0$)?

```plaintext
RES := 1;
LOOP (IF X=1 THEN BREAK ELSE RES := RES × X; X := X-1)
```

You may place restrictions that you consider reasonable on the form of $C$, but these should be discussed and motivated.

[20 marks]