1a. Draw a ***flowchart*** that represents an algorithm that prompts a user to input their name, then greets them with a hello message including their name.

The solution on the left is okay, but the solution on the right has a process block that more clearly shows that there is a computation when concatenating the strings.

START

output
"Please enter your name"

input name

output
"Hello," + name + "."

END

START

output
"Please enter your name"

input name

greeting =
"Hello," + name + "."

output greeting

END
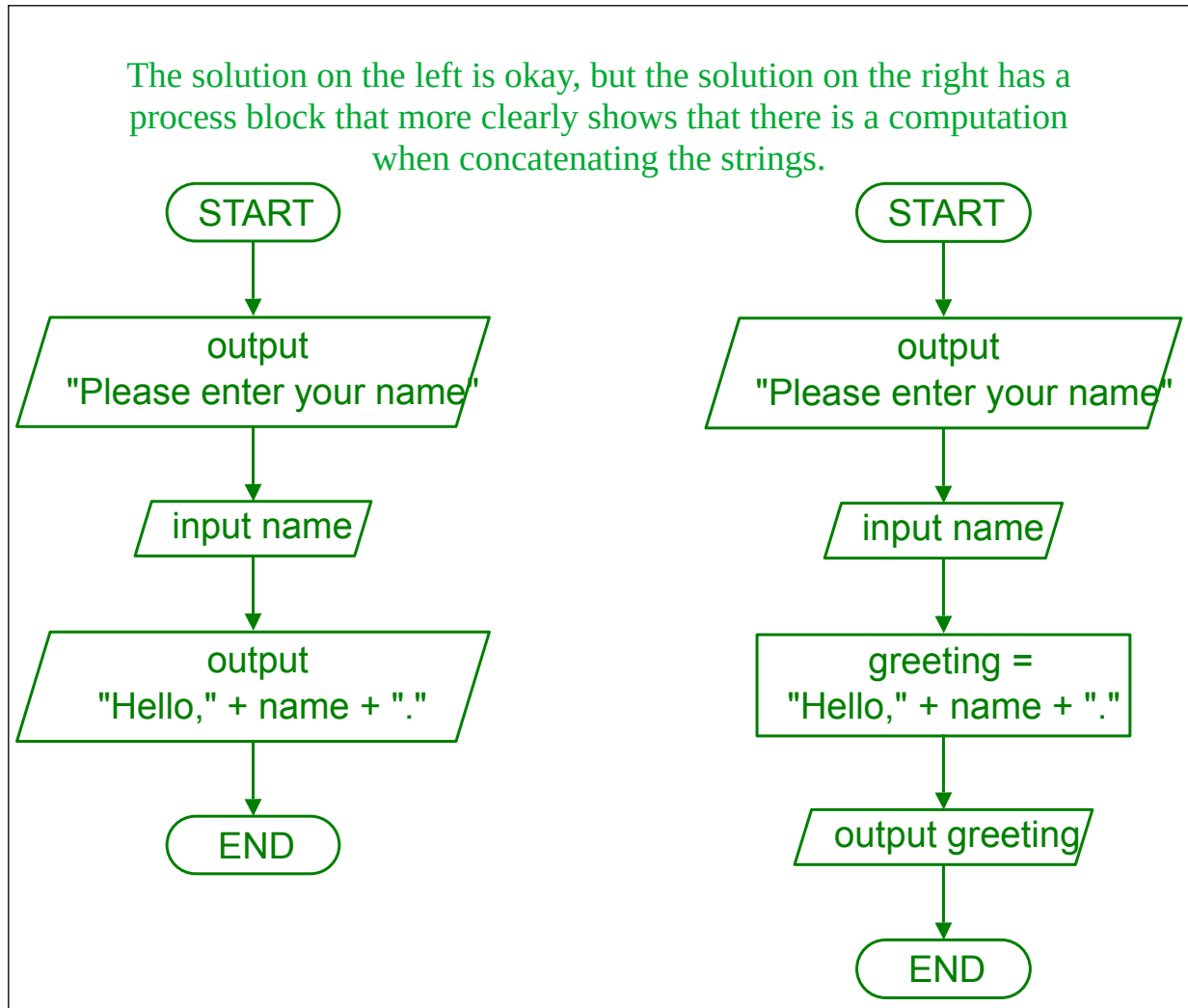
1b. Write the ***pseudocode*** for the flowchart above.
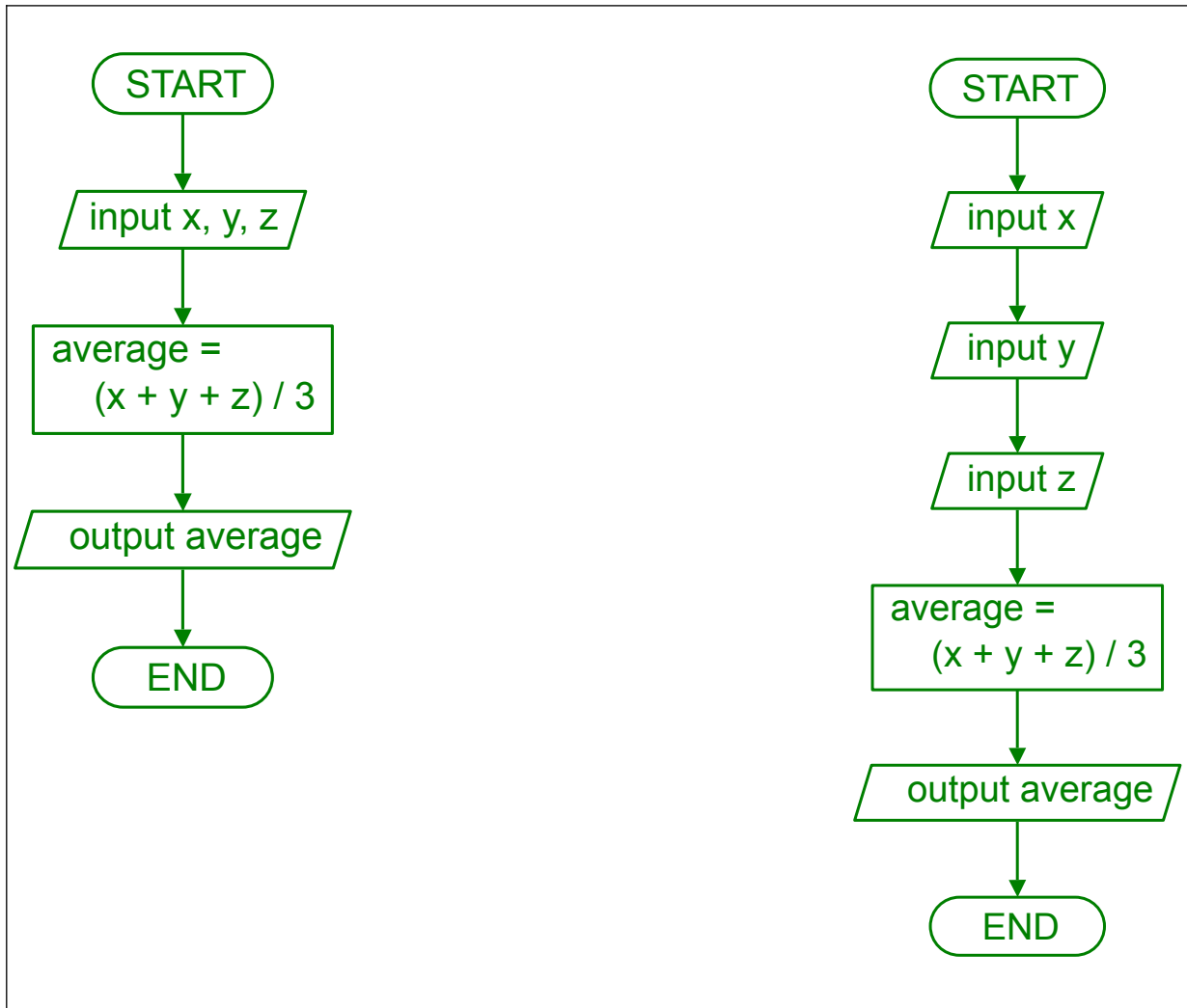
```
SEND 'Please enter your name' TO DISPLAY
RECEIVE name FROM KEYBOARD
SEND 'Hello,' + name + '.' TO DISPLAY


        OR:


SEND 'Please enter your name' TO DISPLAY
RECEIVE name FROM KEYBOARD
SET greeting TO 'Hello,' + name + '.'
SEND greeting TO DISPLAY
```

2a. Draw a *flowchart* that represents an algorithm that takes three numbers as inputs (call them x, y, and z), and outputs the average of those three numbers.

```
   ( START )                                    ( START )
       │                                            │
       ▼                                            ▼
  / input x, y, z /                            / input x /
       │                                            │
       ▼                                            ▼
  ┌──────────────┐                             / input y /
  │ average =    │                                  │
  │  (x + y + z) / 3 │                               ▼
  └──────────────┘                             / input z /
       │                                            │
       ▼                                            ▼
  / output average /                          ┌──────────────┐
       │                                      │ average =    │
       ▼                                      │  (x + y + z) / 3 │
   ( END )                                    └──────────────┘
                                                    │
                                                    ▼
                                              / output average /
                                                    │
                                                    ▼
                                                ( END )
```
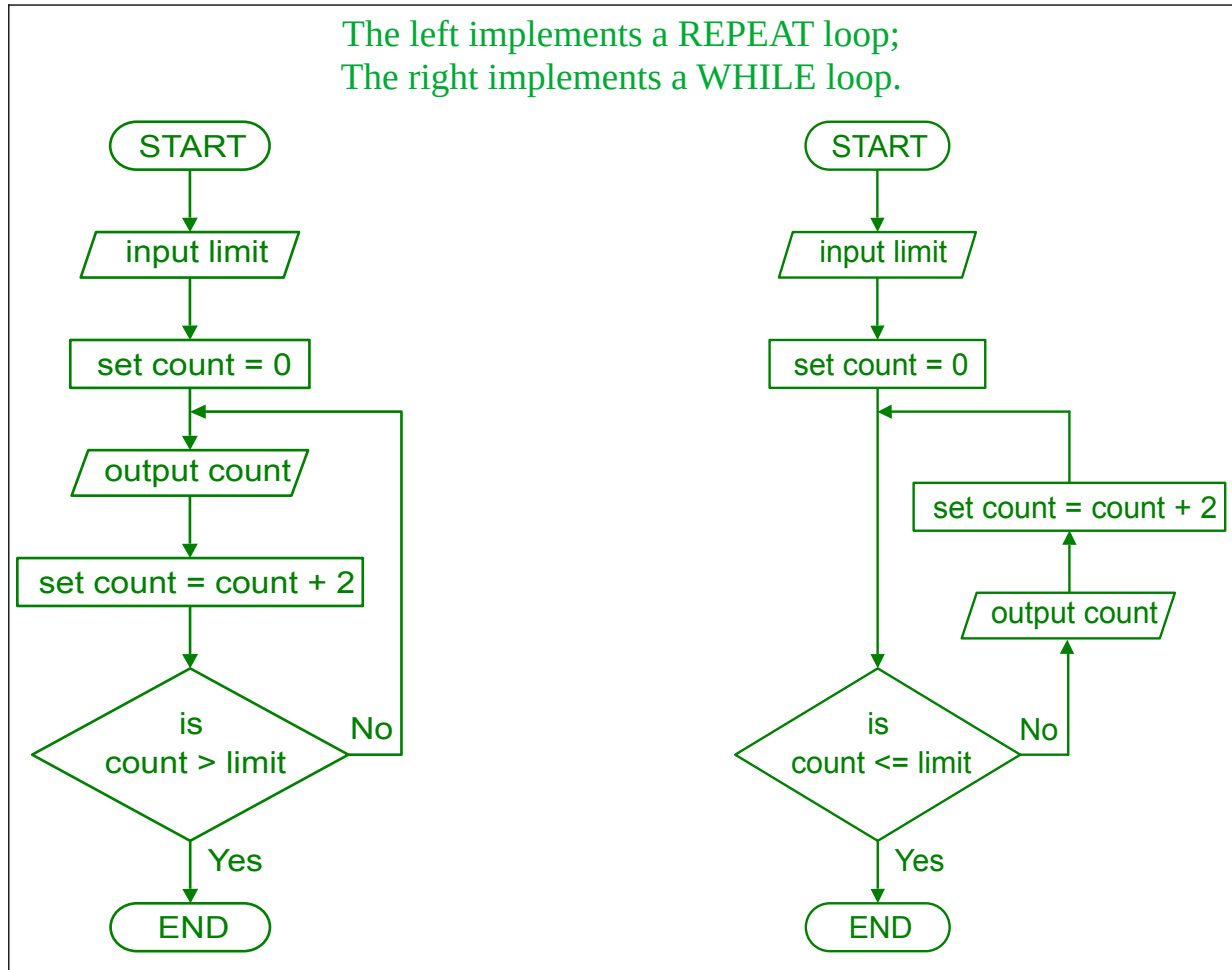
2b. Write the *pseudocode* for the flowchart above.

```
RECEIVE x, y, z FROM KEYBOARD
SET average TO (x+y+z)/3
SEND average TO DISPLAY


        OR


RECEIVE x FROM KEYBOARD
RECEIVE y FROM KEYBOARD
RECEIVE z FROM KEYBOARD
SET average TO (x+y+z)/3
SEND average TO DISPLAY
```

3a. Draw a *flowchart* that represents an algorithm that inputs an integer (call it `limit`) and outputs all <u>even</u> numbers between zero and `limit`. (You can assume `limit` is a whole number).

The left implements a REPEAT loop;
The right implements a WHILE loop.
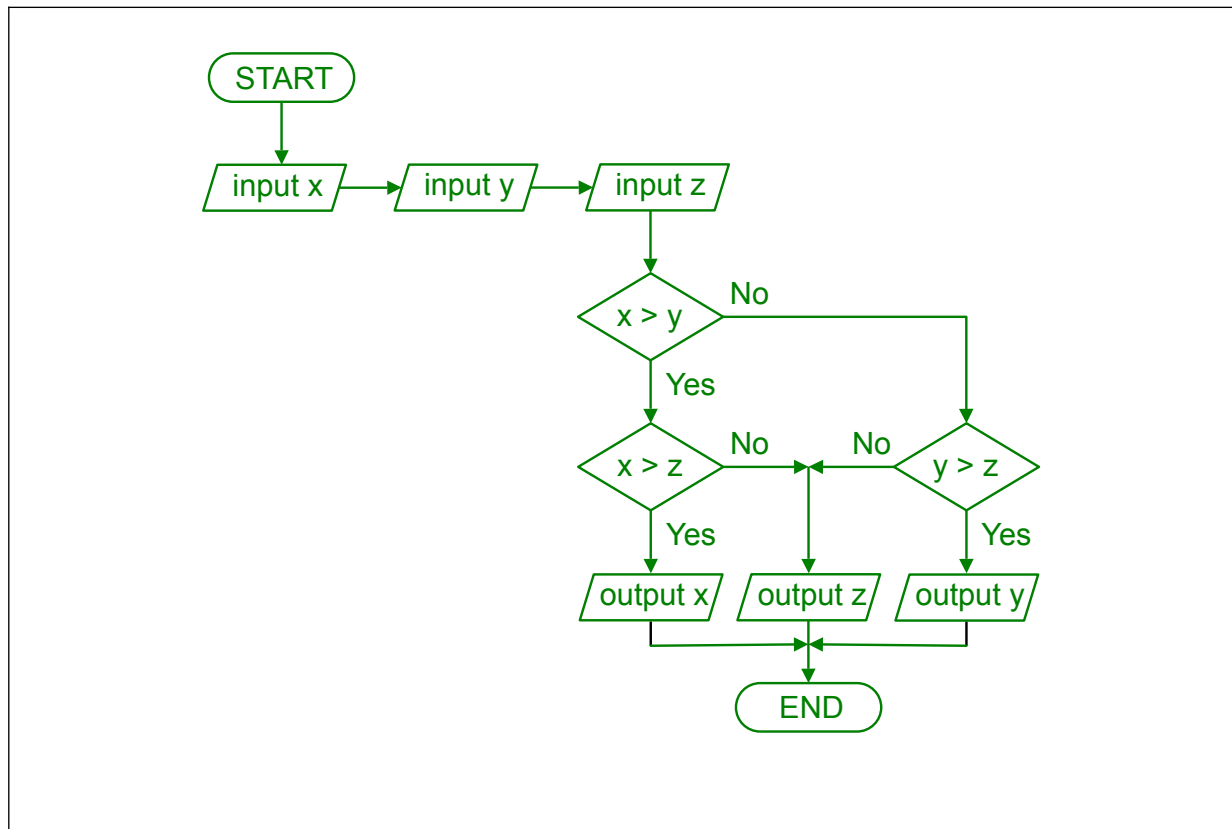
3b. Write the *pseudocode* for the flowchart above.

```
RECEIVE limit FROM KEYBOARD
SET count TO 0
REPEAT
    SEND count TO DISPLAY
    SET count TO count + 2
UNTIL count > limit
```

```
RECEIVE limit FROM KEYBOARD
SET count TO 0
WHILE count <= limit DO
    SEND count to DISPLAY
    SET count TO count + 2
END WHILE
```

4a. Draw a flowchart that represents an algorithm that inputs three numbers (call them x, y, and z), and outputs the largest of those three numbers.

START

input x → input y → input z

x > y — No
Yes

x > z — No   No — y > z
Yes   Yes

output x   output z   output y

END

4b. Write the pseudocode for the flowchart above.

```
RECEIVE x FROM KEYBOARD
RECEIVE y FROM KEYBOARD
RECEIVE z FROM KEYBOARD
IF x>y THEN
    IF x>z THEN
        SEND x TO DISPLAY
    ELSE
        SEND z TO DISPLAY
    END IF
ELSE
    IF y>z
        SEND y TO DISPLAY
    ELSE
        SEND z TO DISPLAY
    END IF
END IF
```