Question 1:

a)

The user is asked to enter a pupil's name. Their input, 'Keon', is stored in the variable *name*.

The user is asked to enter the number of birds counted out of 80. Their input, 70 is stored in the variable *count_result*.

This variable, '70', *count_result* is multiplied by 1.25 and rounded to the nearest whole number. The result, '88', is then stored in a variable called *count_percentage*.

The sprite then displays the message 88% for 2 seconds.

The program then checks to see if *count_percentage* is greater than 85.

The name *Keon* is then added to the list *wren_list*.

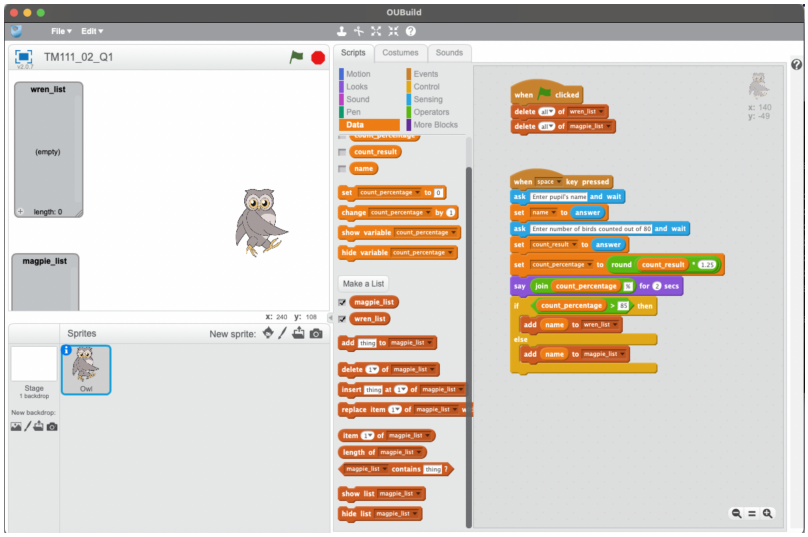
b)
i.

The number 1.25 could be stored as a constant.

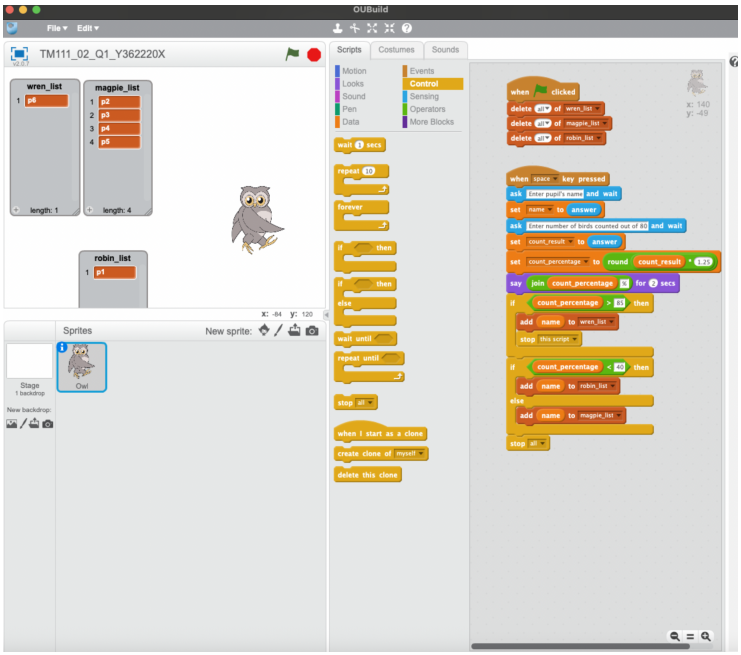
ii.

This constant could be called *percentage_multiplier*.

c)



d)
i.

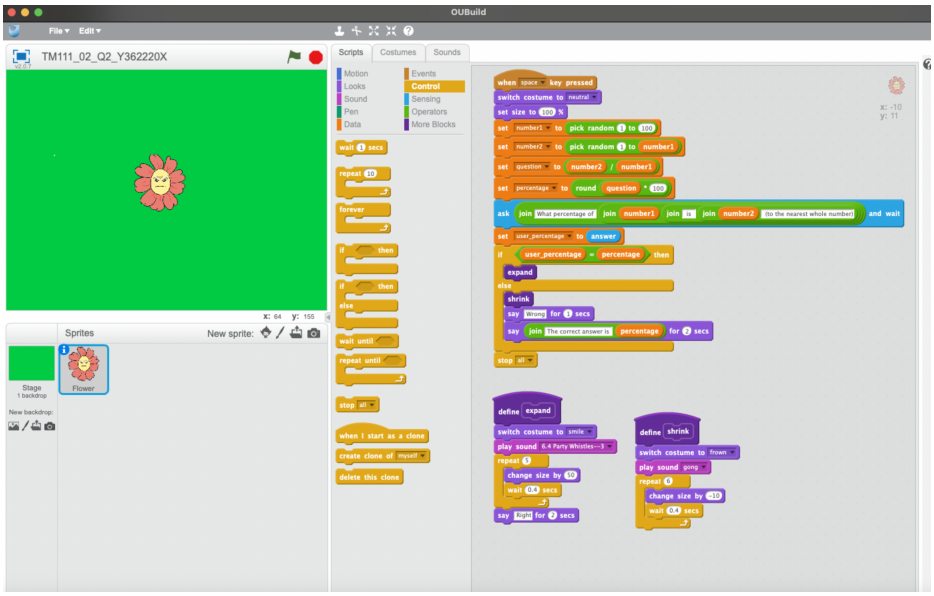


ii.

I could have used three if statements, one for each of the three possible lists.

Question 2:

a)



b)

Question 3:

a)

Clear all variables

input word

Repeat until end of word

if

check if character *i* is in the banned list.

is on list *i + 1*

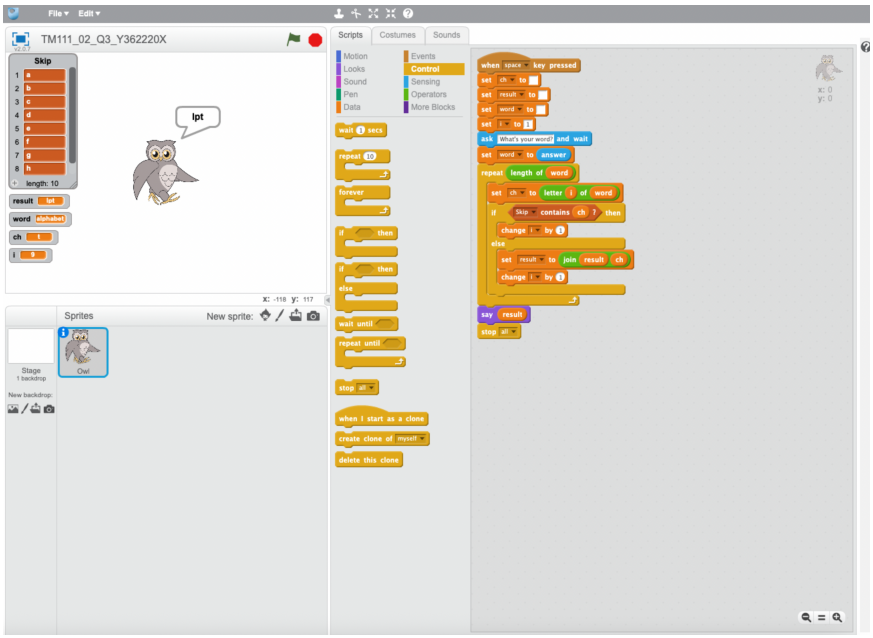
else

add character to *result*

say *result*

end

b)



c)

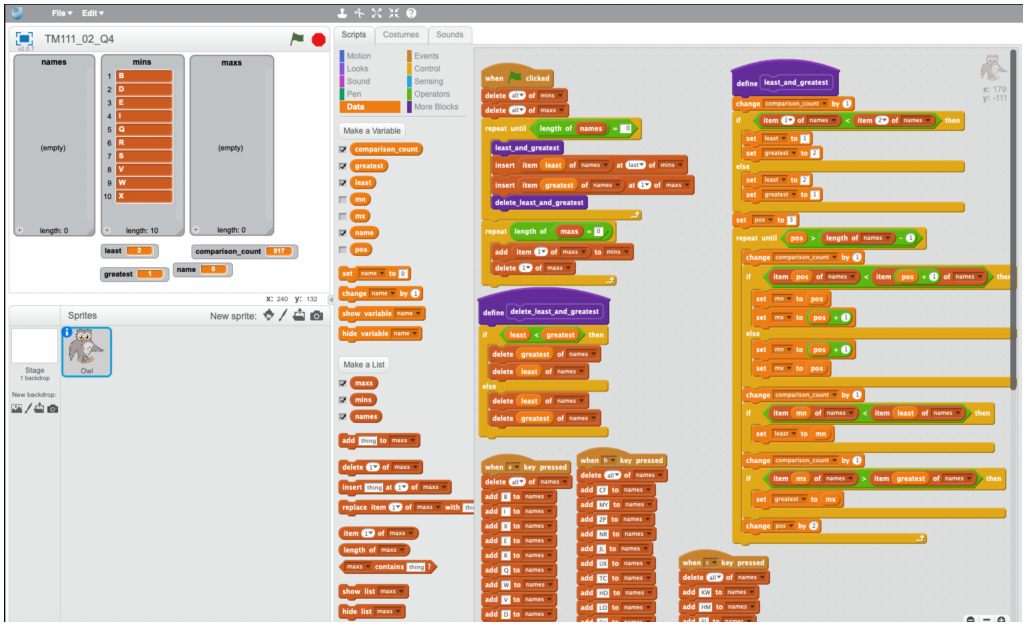
Test number	Test purpose	input	Expected result
1	Frist and last letters are in the first ten letters of the alphabet	apple	ppl
2	Double letters from the first ten letters of the alphabet	keep	kp
3	Program works despite case of input	BoOkKeEpEr	oOkKpr

Question 4:

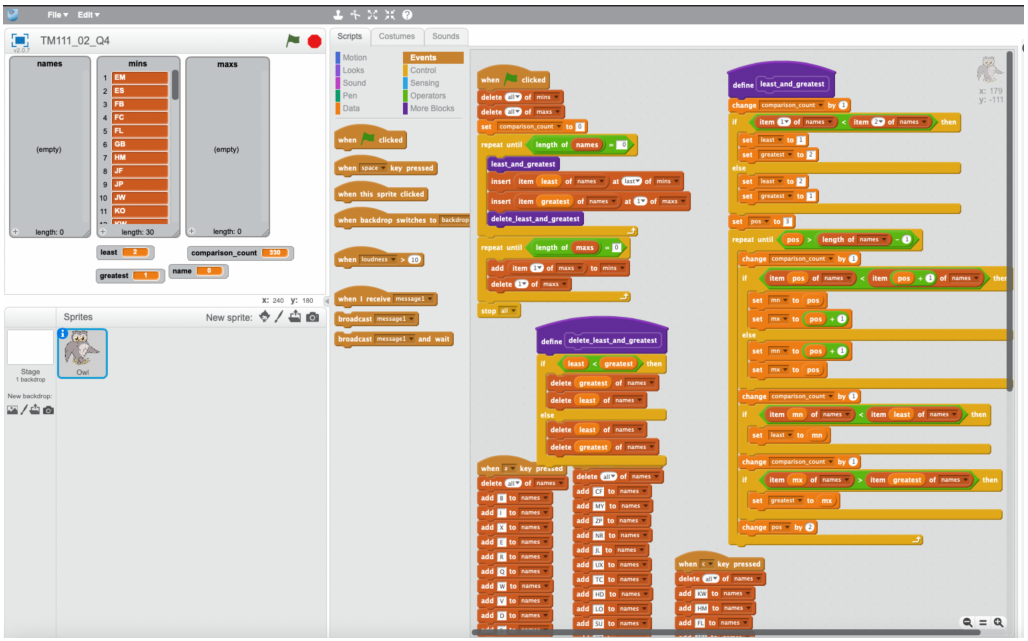
a)

Test number	Test purpose	Existing data	Expected result	
		names	least	greatest
1	Least name at position 1, greatest at position 3	B, I, X, E, R, Q, W, V, D, S	1	3
2	Least name at position 2, greatest at position 1	Y, A, C, F, H, J, L, M, O, P	2	1
3	Least name at position 1, greatest at position 6	G, T, K, N, U, Z, H, L, J, O	1	6

b)



c)
i.



ii.

size of list	10	20	30
Number of comparisons	35	145	330

iii.

The number of comparisons is not linear because the number of comparisons does not increases by the same amount each time the list increases by the same amount.

iv.

size of list (n)	10	20	30
$n \times (n-1)2$	45	190	435
$0.75 \times n \times (n-1)2$	34	143	327

The number of comparisons made is close to the theoretical maximum number of comparisons, which is $n \times (n-1)2$, multiplied by 0.75 as program expected a 25% improvement.

Given that the number of comparisons has remained close to the theoretical number for our 3 test, we can assume that this will continue for larger lists. Therefore, if we were sorting a list of 1000 names, the number of comparisons would be approximately $0.75 \times 1000 \times 9992 = 374625$.

d)

The double selection sort algorithm would lie approximately in the middle of the selection sort and the bubble sort 1 algorithm.