Question 1：

Read instructions below, judge whether the program will eventually halt and give reason. (2marks)

add 2

bne 9 1

Answer:

This program won't halt. Because the value of register will only be 2N(N =0, 1, 2, 3…127), so it can never be 9, so when it comes to line 2 "bne 9 1" it will never get the result 9, so never "not equals".

	step	value of register	next	result
loop start	1	0	add 2	2
	2	2	bne 9 1	not equals 9. junp to line 1
	3	2	add 2	4
	4	4	bne 9 1	not equals 9. junp to line 1
		…	…	…
		254	add 2	0
loop		0	bne 9 1	not equals 9. junp to line 1

Question 2：

Read instructions below, show the value of register and the instruction next for each steps. (if the program will run forever, show the loop)(3 marks)

add 126

blt 126 1

add 2

bgt 127 1

Answer:

Step	value of register	next	result
1	0	add 126	126
2	126	blt 126	n
3	126	add 2	128
4	128	bgt 127	y, jump to 1
5	128	add 126	254
6	254	blt 126	n
7	254	add 2	0
8	0	bgt 127	n
	halt		

Question 3：

Read instructions below, show the value of register and the instruction next for each steps. (if the program will run forever, show the loop)(5 marks)

add 126
add 1
bgt 127 1
blt 252 2

Answer:

	step	value of register	next	result
	1	0	add 126	126
loop start	2	126	add 1	127
	3	127	bgt 127	n, continue
	4	127	blt 252	y, jump to 2
	5	127	add 1	128
	6	128	bgt 127	y, jump to 1
	7	128	add 126	254
	8	254	add 1	255
	9	255	bgt 127	y, jump to 1
	10	255	add 126	125
	11	125	add 1	126
	12	126	bgt 127	n, continue
	13	126	blt 252	y, jump to 2
Loop end				
Start again	14	126	add 1	127