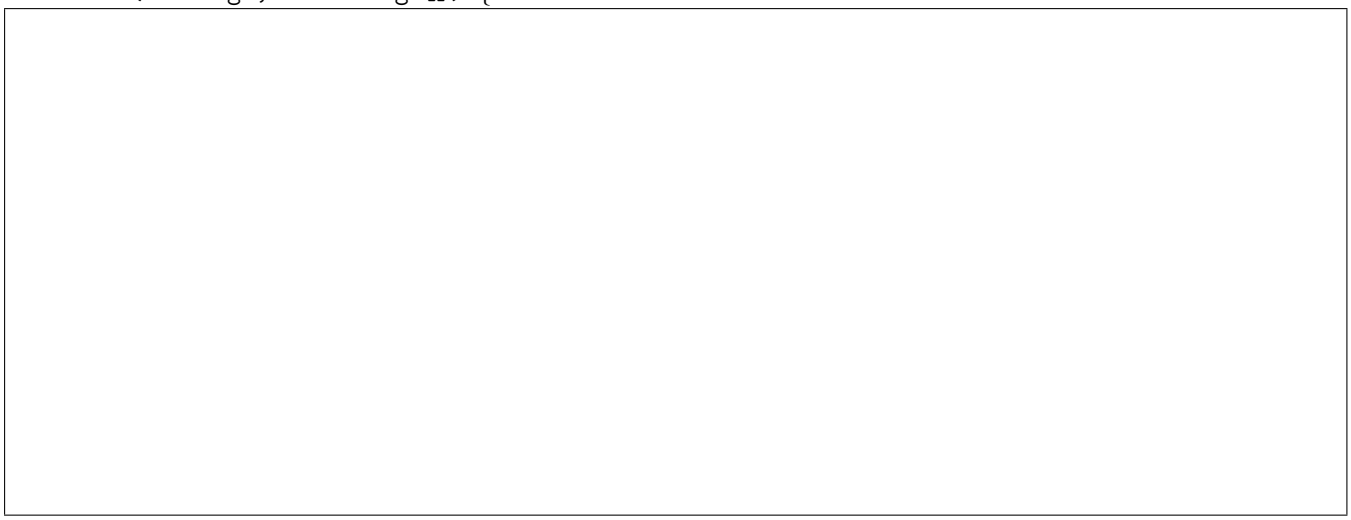
ISU Programming Assessment, Mar 01, 2019

Name: _____ CS class_____

Put all answers in boxes. Nothing you write outside the boxes will be counted. Did you bring an eraser?

1. **Write** a program that gets an integer, `n`, from the user and then prints `n` repetitions of the pattern: some `A`'s then some `B`'s. The first pattern, has one `A` and $2 * n - 1$ `B`'s. Each new pattern has one more `A` and two fewer `B`'s than the pattern before it. **Example:** if `n=3`, then the program will print `ABBBBBAABBBAAAB`

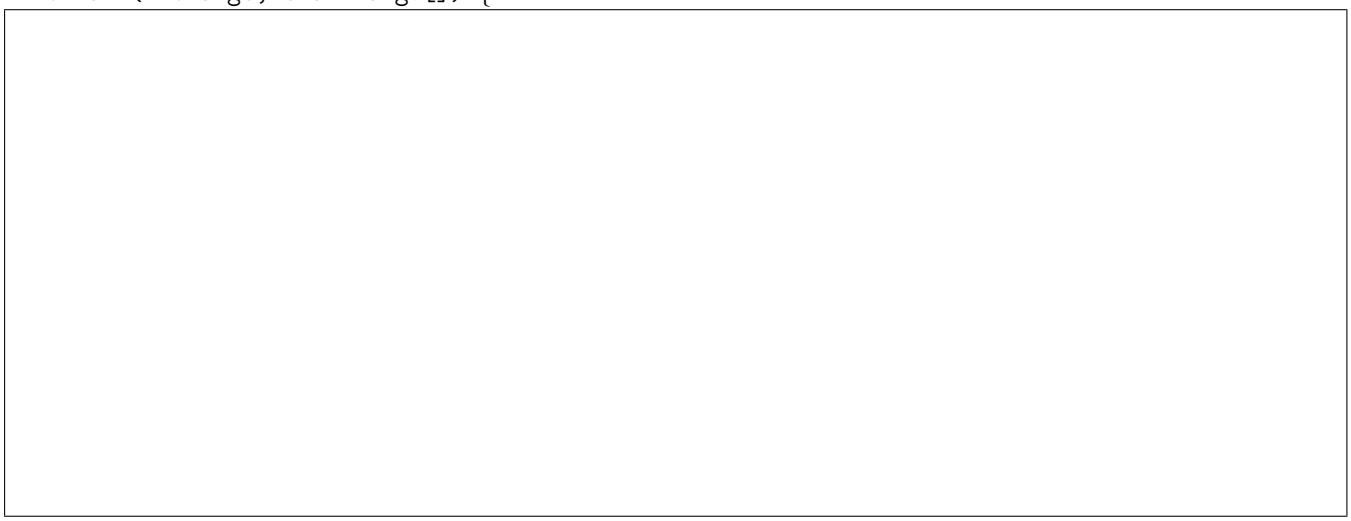
```
int main(int argc, char *argv[]) {
```



```
  return 0;
}
```

2. **Get input a character at a time.** Write a program that counts the total number of sequences consisting of the letter `t` followed by a period. It should print out the only the final count.

```
int main(int argc, char *argv[]) {
```

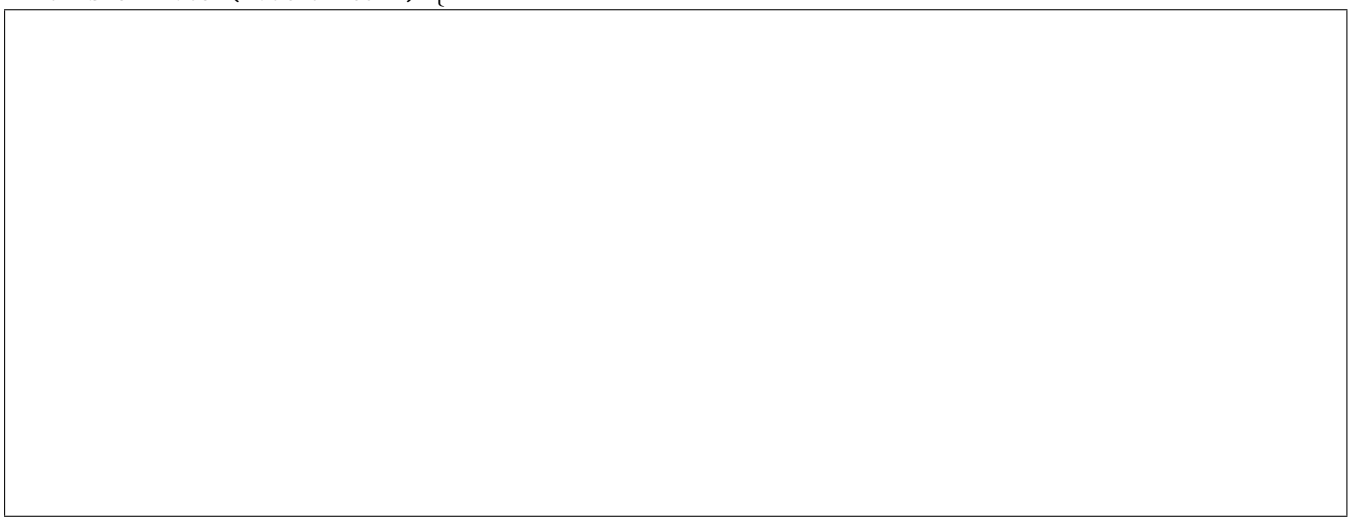


```
  return 0;
}
```

3. Write the function `smallTotal` that is passed the address of the first node of the list. The function finds the sum of all the numbers in the list that are less than 100. It returns this sum.

```
typedef struct NODE {
  int data;
  struct  NODE *next;
}   node_t;

int  smallTotal(node_t *curr) {
```



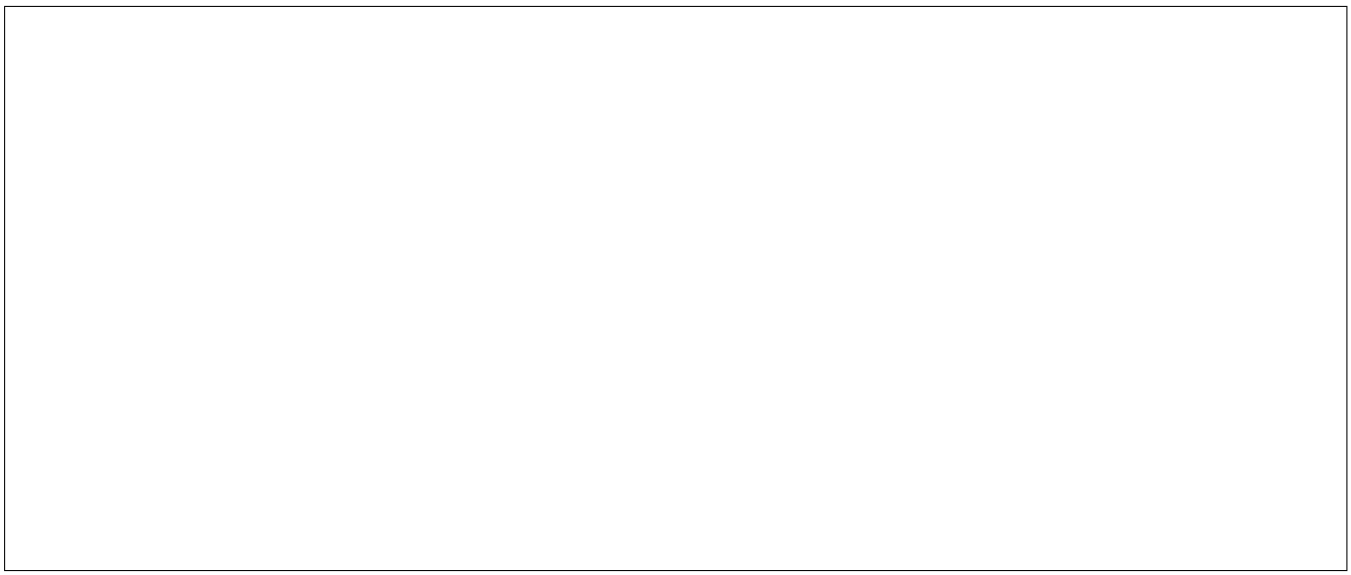
```
}
```

4. A BST is constructed in the usual way using the node definition below. **Write** the function

```
int countNodes( bst_node_t *curr)
```

that is passed the address of the head node of the BST. It counts and returns the number of nodes in the BST.

```
typedef struct  BST_NODE_T   {
 int   data;
 struct   BST_NODE_T   *left,   *right;
}   bst_node_t;
```



5. Write the function

```
int count00(int n)
```

where `n` is a 32–bit int. The function counts and returns the number of 00 bit sequences in `n`. **Example:** the 8 bit sequence `10110001` contains two 00 sequences.