ISU Programming Assessment, March 28 2018

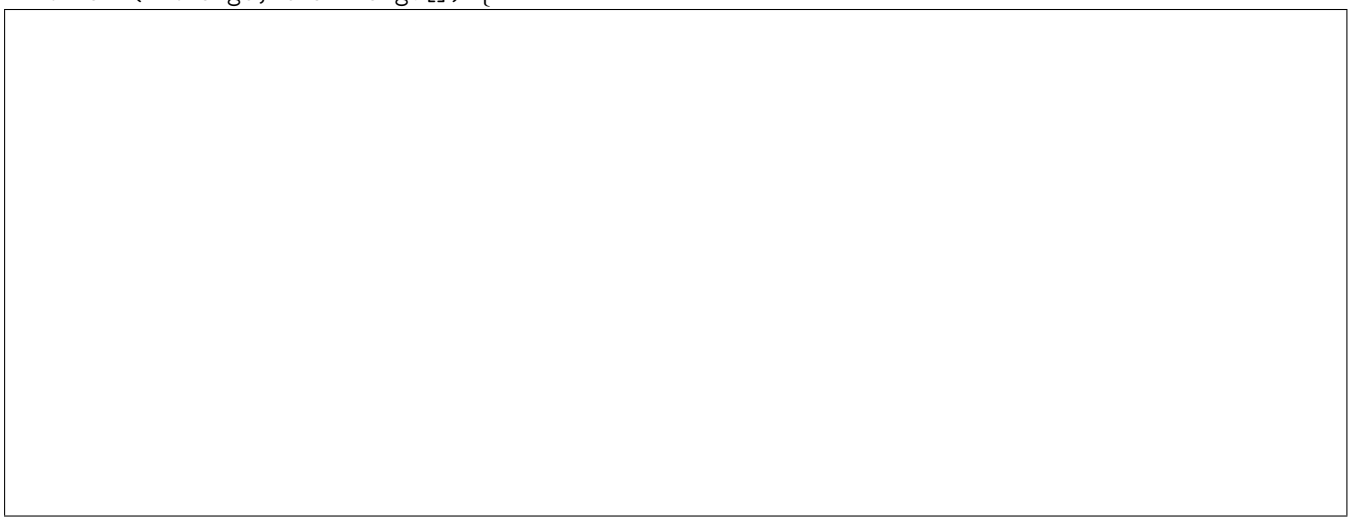
Name: _____ CS class_____

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

1. Write program that gets an integer, `n`, from the user and then prints `n` repetitions of the pattern: an A, some B's, then a C. Each new repetition has one less B than the pattern before it. The first pattern has `n` B's. For n=4, the program should print

`ABBBBCABBBCABBCABC`

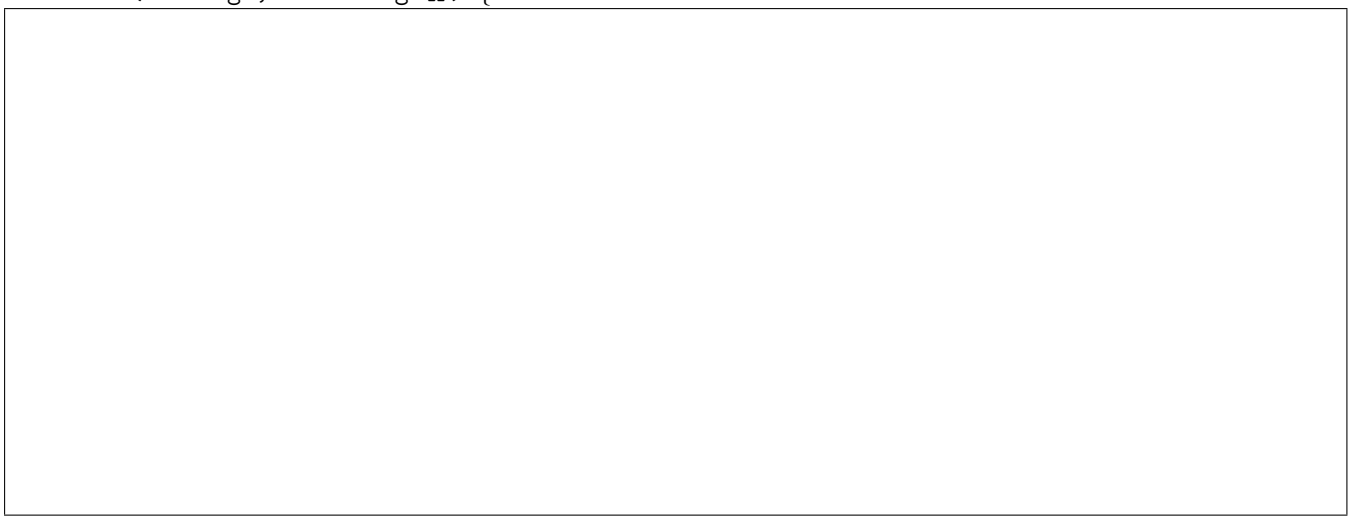
```
int main(int argc, char *argv[]) {
```



```
  return 0;
}
```

2. **First Half. Write** a C program that reads from stdin one 8-bit character at a time. The program should count the number of characters that are in the first half of the alphabet (a–m or A–M) upper or lower case. It should print just one value: the final count.

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

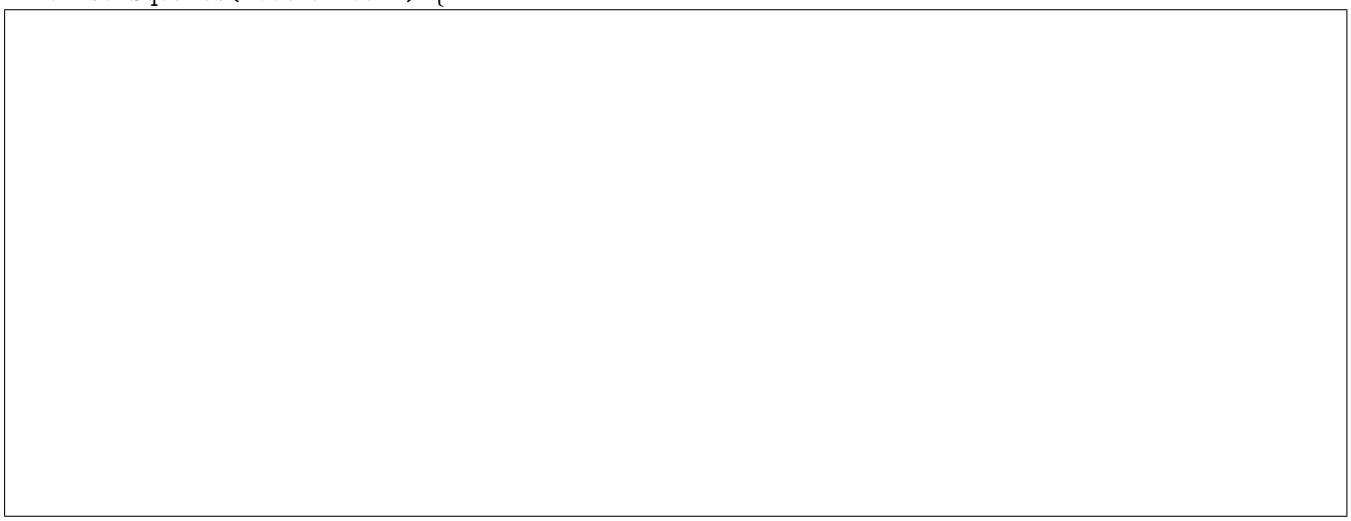


```
  return 0;
}
```

3. bf sumSquares. Write the function `sumSquares` that is passed the address of the first node of the list. It finds the sum of the squares of all the numbers in the list. It returns the final sum.

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

int  sumSquares(node_t *curr) {
```



```
}
```

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

```
int sumEven(bst_node *curr)
```

that returns the sum of all the even data in the tree.

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

5. Write the function

```
int count10(int n)
```

that counts the number of 1 bits that have a 0 bit to their immediate right. **Example (for 8 bits):** `10101101`. The function should return 3.