ISU Programming Assessment, Nov 13 2017

Name: _____ CS class account: _____

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

1. Write a C program that uses a loop to print all perfect cubes (1, 8, 27, …) up to 432.

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

```
  return 0;
}
```

2. Write a C program that reads from stdin and prints every third line (first, then fourth, then seventh, etc.).

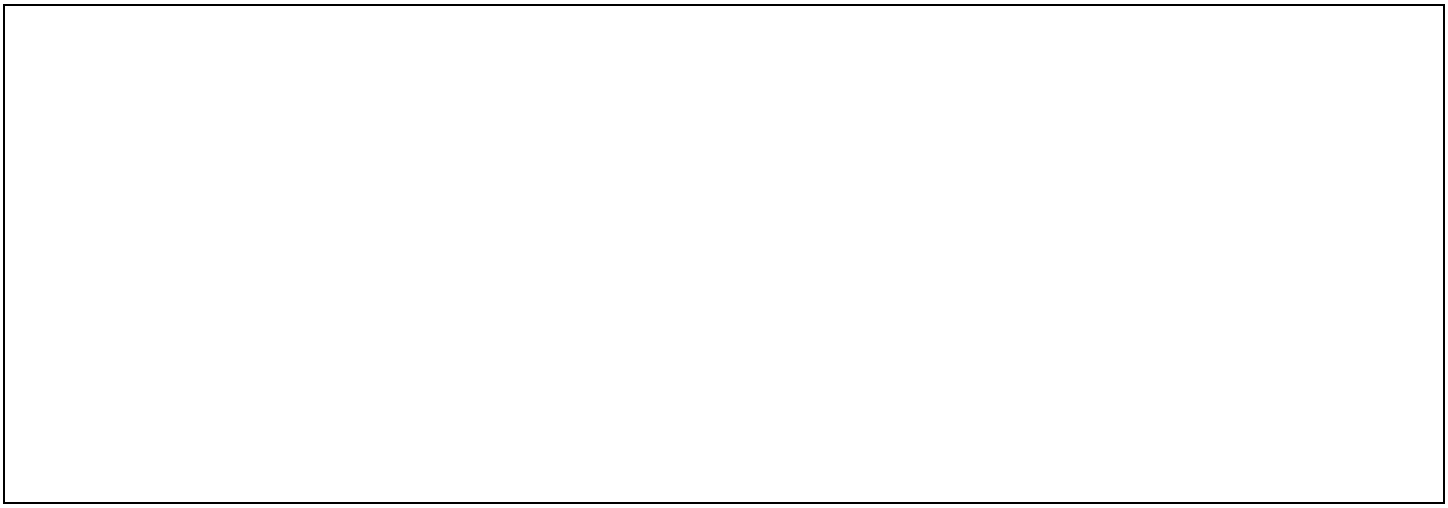
```
int main(int argc, char *argv[]) {
```

```
  return 0;
}
```

3. Write a loop that prints the initial items in a linked list that are in strictly decreasing order. Use the types and variables declared below. If the list had the numbers: 3, 2, 1, 2 then it would print the first three numbers.

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

int main(int argc, char *argv[]) {
  node_t *head, *ptr;
  /* Assume that the list is somehow created here. */
```



```
  return 0;
}
```

4. Write a function named `total` that has the root of a binary tree as parameter, and which returns the number of nodes in the binary tree that have two children (both left and right are not NULL). Use the following type declaration.

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

5. Write a C function named `justOne` that takes an unsigned `int` as parameter and returns the third byte from the number. `justOne(0x12345678)` would return 0x56 (86 in decimal), `justOne(0x11223344)` would return 0x33 (51 in decimal).