

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 squares (1, 4, 9, ...) up to 234.

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

```
    return 0;  
}
```

2. Write a C program that reads from stdin and prints every second line (first, then third, then fifth, 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 increasing order. Use the types and variables declared below. If the list had the numbers: 1, 2, 3, 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 one child (left or right is not NULL, the other is 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 second byte from the number. `justOne(0x12345678)` would return `0x34` (52 in decimal), `justOne(0x11223344)` would return `0x22` (34 in decimal).

