ISU Programming Assessment, Nov 27 2017

Name: _____   CS class (and class account if you have one): _____

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 between 1 and one million that are also a multiple of 7. Note that the first two integers printed will be 49 and 196 (which is $(7 \times 2)^2$).

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



  return 0;
}
```

2. Write a C program that reads from stdin and prints "word" if **all** characters read are letters, and "not" otherwise. Note that if abcdef is read, the program would output "word"; If abc def *(with a space)* is read, the program would output "not".

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



  return 0;
}
```

3. Write a loop that computes the average string length of strings in a linked list. Use the types and variables declared below. If the list had the three strings - the, it, of - then the correct output would be 2.333

```c
typedef struct NODE {
  char *str;
  struct NODE *next;
} node_t;

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

```






```

```c
  return 0;
}
```

4. Write a function named smallerPrint that has the root of a binary tree as parameter, has an integer as parameter, and prints the data for all nodes that have their value less than the integer parameter Use the following type declaration.

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

5. Write a C function named `pal` that takes an `unsigned char` as parameter and returns 1 if the bits of the parameter forms a palindrome (bits are same forward as reverse - since you have 8 bits total, there are 4 conditions to check) and returns 0 otherwise. Calling `pal` on each of the following would return 1: 0, 129 (which is 10000001 in binary), 24 (which is 00011000 in binary), 165 (which is 10100101 in binary).