

CMSC 106 Quiz 4 Worksheet

The second quiz for the course will be on Wed, Nov 14. The following list provides more information about the quiz:

- The quiz will be a written quiz (no computer).
- Closed book, closed notes quiz.
- Answers must be neat and legible.
- Quiz instructions can be found at <http://www.cs.umd.edu/~nelson/classes/utilities/examRules.html>

The following exercises cover the material to be included in this quiz. Solutions to these exercises will not be provided, but you are welcome to discuss your solutions with the TA or instructor during office hours. It is recommended that you try these exercises on paper first (without using the computer).

Exercises

1. The function called **filter** has the following prototype:

```
static int filter(int src[], int dest[], int array_size,
                 int lower_bound, int upper_bound)
```

The function initializes the dest array with elements that have values in the range defined by lower_bound (inclusive) and upper_bound (inclusive). The size of src and dest is array_size. The function will return the number of elements placed in dest. You can assume lower_bound is less than or equal to upper_bound.

2. Draw a memory map for the following code.

```
#include <stdio.h>

int main() {
    int val[3] = {10, 7, 14};

    int data = 100;
    int *p = &data;
    int y = 1;
    int **q = &p;

    *p += 100;
    printf("First %d %d %d\n", *p, data, y);

    y++;
    printf("Second %d\n", **q);

    p = &val[y];
    printf("Third %d\n", **q);

    return 0;
}
```

3. The function **replace_char** has the prototype below. The function replaces instances of the character **target** present in **str** with the character **replacement**. For example, if str is "Hello" and we have the call **replace_char(str, 'l', 'p')** str will have the value heppo. The function returns the number of characters that were replaced. For this problem you may not use any string library function (e.g., strcmp, etc.).

```
int replace_char(char str[], char target, char replacement)
```

4. What makes a character array a string? Is every character array a string?
5. The function **last_char_index** returns the index where ch is located last in str. If ch is not in the string, or ch is '\0', return -1. The prototype of the function is:

```
static int last_char_index(char str[], char ch)
```

6. Define a function called **is_palindrome** that takes a string as a parameter. The function will return 1 if the string parameter is a palindrome and 0 otherwise.
7. Write a function called **blank_line** which returns an integer and has a string as a parameter. The function will return 1 if the string represents a blank line and 0 otherwise. A line will be considered a blank line if it only includes the characters '\t' '\b' or ' '. You can assume the '\n' character will not be part of the line.