

## MTH 307: Programming and Data Structures

### Homework V

(Due 02/04)

Write C programs for the following:

1. Computing the determinant of a  $4 \times 4$  matrix using a recursive algorithm.
2. Computing the inverse of a  $4 \times 4$  matrix.
3. Sorting a given list of numbers using the bubble or selection or insertion sorting methods, based on the choice of the user. The problem should also display the intermediate iterations involved before arriving at the sorted list.
4. Displaying the elements of the alternating subgroup  $A_n$  (comprised of all permutations that can be expressed as a product of an even number of transpositions or swaps) of the symmetric group  $S_n$ .
5. Writing a function so that when an array `a` of length `n` is passed, the function will search for largest and smallest elements in `a` and store them in the variable pointed to be `largest` and `smallest`. For example,

```
void find_largest_smallest(int a[], int n, int *largest, int *smallest)
```

6. Computing the sum of the elements of a two-dimensional array of numbers using pointer arithmetic. Please note that only one loop should be used.
7. Reversing a string and determining whether it is a palindrome by using a pointer to keep track of array subscripting.