CSCE 221 Cover Page
Programming Assignment #1
Due February 5 at midnight to CSNet

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Please list all sources in the table below including web pages which you used to solve or implement the current homework. If you fail to cite sources you can get a lower number of points or even zero, read more in the Aggie Honor System Office http://aggiehonor.tamu.edu/

Type of sources				
People	Natalie Rawle	Devin Carr	Cody Taylor	Nichol
Web pages (provide URL)	http://www.cplusplus.com/doc/tutorial/templates/			
Printed material				
Other Sources				

I certify that I have listed all the sources that I used to develop the solutions/code to the submitted work.

"*On my honor as an Aggie, I have neither given nor received any unauthorized help on this academic work.*"

Your Name (signature) Date

a) This program is a custom vector data structure. The purpose of this assignment is to utilize our knowledge of data structures to create a vector class and estimate the run time of the functions within the vector class.

b) I learned about the vector data structure by doing this assignment.

get_size() Running time: O(1) Theoretical: O(1)
get_capacity() Running time: O(1) Theoretical: O(1)
operator[](int i) Running time: O(1) Theoretical: O(1)
bool is_empty() Running time: O(1) Theoretical: O(1)
elem_at_rank(int r) constRunning time: O(1) Theoretical: O(1)
insert_at_rank(int r, const char& elem) Running time: O(n) Theoretical: O(n)
replace_at_rank(int r, const char& elem) Running time: O(n) Theoretical: O(n)
remove_at_rank(int r) Running time: O(n) Theoretical: O(n)
operator<<(ostream& out, const My_vec& vec) Running time: O(n)
find_max_index(const My_vec& v,int size) Running time: O(n)
sort_max(My_vec& vec) Running time: $O(n^2)$

c) How to compile: use the makefile (i.e. type "make" into the command line). How to run: ./main.

d) A Range exception is thrown when the rank given in the insert, replace, and remove functions are either less than 0 or greater than the size of the vector.

e) A class template is used on the My_vector (see My_vector.h) ADT in the program.

f) Valid Cases: Any type of data that matches given template type and inserting, replacing, or removing at valid rank (0 <= r < size)

Invalid Cases: Insert, Replace, Remove at invalid ranks (r < 0 or r => size), input that does not match specified template type

Random Cases: none.

```
:: ./main
[ B ]
1
[ A B ]
2
[ A B C D E F G H I J K L ]
[ A B C D E F G H I J D K L ]
13
[ A B D E F G H I J D K L ]
12
[ A B E E F G H I J D K L ]
12
[ A B E E F G H I J D K L ]
[ A B Y E F G H I J D K L ]
[ K ]
1
[ A B Y E F G H I J D K L ]
12
2
[ A B D E F G H I J K L Y ]
[ A B D E F G H I J K L Y C D S F G H I J K L ]
integers
[ 2 ]
1
[ 1 2 ]
2
[ 1 2 3 4 5 6 7 8 9 10 11 12 ]
[ 1 2 3 4 5 6 7 8 9 10 4 11 12 ]
13
[ 1 2 4 5 6 7 8 9 10 4 11 12 ]
12
[ 1 2 5 5 6 7 8 9 10 4 11 12 ]
12
[ 1 2 5 5 6 7 8 9 10 4 11 12 ]
[ 1 2 25 5 6 7 8 9 10 4 11 12 ]
[ 11 ]
1
[ 1 2 25 5 6 7 8 9 10 4 11 12 ]
12
2
[ 1 2 4 5 6 7 8 9 10 11 12 25 ]
[ 1 2 4 5 6 7 8 9 10 11 12 25 3 4 19 6 7 8 9 10 11 12 ]
doubles
[ 2 ]
1
[ 1 2 ]
2
[ 1 2 3 4 5 6 7 8 9 10 11 12 ]
[ 1 2 3 4 5 6 7 8 9 10 4 11 12 ]
13
[ 1 2 4 5 6 7 8 9 10 4 11 12 ]
12
[ 1 2 4 5 6 7 8 9 10 4 11 12 ]
12
[ 1 2 4 5 6 7 8 9 10 4 11 12 ]
[ 1 2 25 5 6 7 8 9 10 4 11 12 ]
[ 11 ]
1
[ 1 2 25 5 6 7 8 9 10 4 11 12 ]
12
```