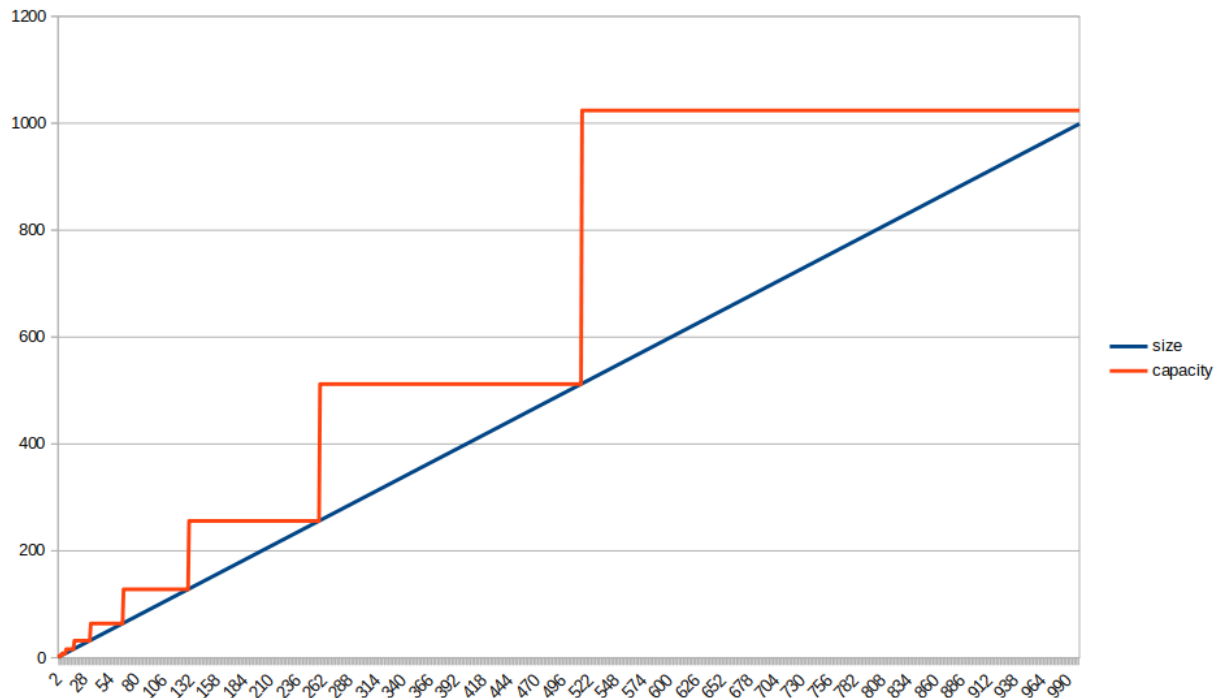


Problem 1 (a-d):

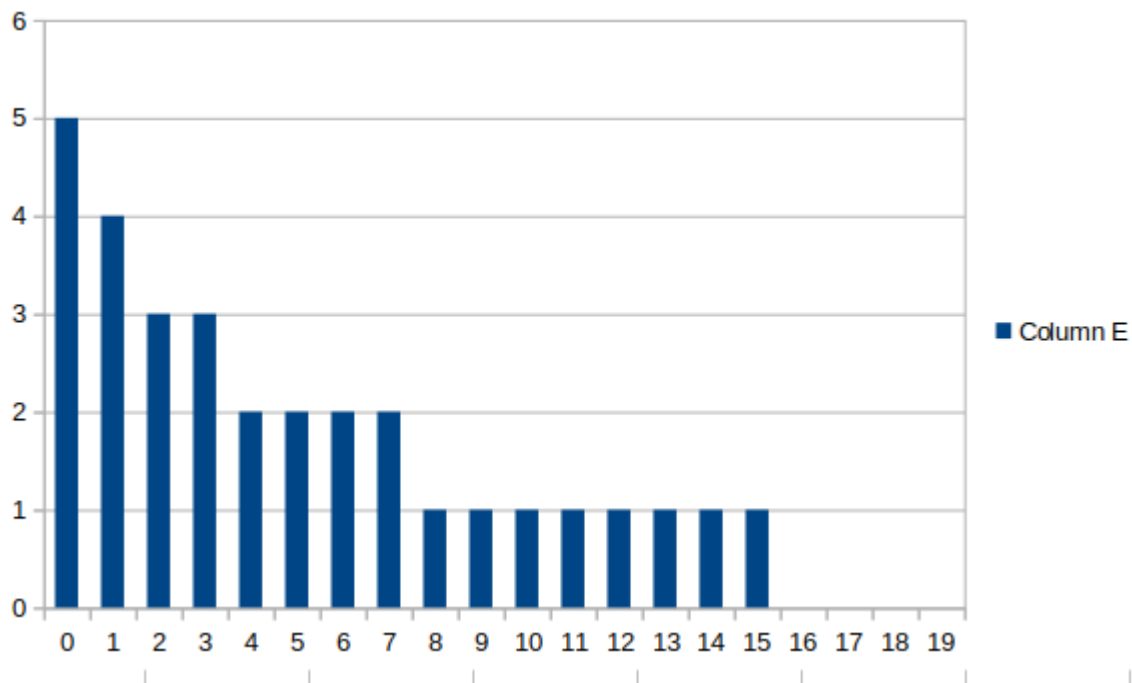
Parts a, c, and d do not work. Part c results in a compile-time error. **Part b works.**

Problem 2:

a) The vector appears to double in size when it runs out of space.



c)



Problem 3

a) My program is called a.out. This screenshot shows the really high memory use.

```
File Edit View Search Terminal Help
top - 19:36:26 up 6:01, 1 user, load average: 0.57, 0.68, 0.89
Tasks: 372 total, 1 running, 285 sleeping, 0 stopped, 0 zombie
%Cpu(s): 4.7 us, 2.4 sy, 0.0 ni, 91.8 id, 0.0 wa, 0.0 hi, 1.1 si, 0.0 st
KiB Mem : 16266424 total, 2824364 free, 8373004 used, 5069056 buff/cache
KiB Swap: 2097148 total, 2097148 free, 0 used. 6509700 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
13843	nikita	20	0	2963180	2.816g	3256	S	2.6	18.2	0:01.49	a.out
2615	nikita	20	0	4850204	615736	278960	S	15.8	3.8	45:29.97	firefox
3538	nikita	20	0	3202068	499292	110852	S	26.3	3.1	50:29.60	Web Content
13115	nikita	20	0	3346180	460204	125092	S	8.6	2.8	0:41.44	Web Content
13158	nikita	20	0	3305488	459284	118980	S	1.0	2.8	2:35.05	Web Content
3574	nikita	20	0	3204924	396188	107600	S	27.6	2.4	45:18.47	Web Content

b) Using the destructor, this is now the peak memory usage of a.out. Clearly, the memory usage was greatly reduced.

```
HW6$ g++ -O2 hw6p3.cpp && ./a.out
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
```

```
File Edit View Search Terminal Help
top - 19:41:08 up 6:06, 1 user, load average: 0.77, 0.82, 0.90
Tasks: 372 total, 1 running, 285 sleeping, 0 stopped, 0 zombie
%Cpu(s): 6.7 us, 3.3 sy, 0.0 ni, 89.1 id, 0.0 wa, 0.0 hi, 0.9 si, 0.0 st
KiB Mem : 16266424 total, 5849824 free, 5327516 used, 5089084 buff/cache
KiB Swap: 2097148 total, 2097148 free, 0 used. 9538116 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
2615	nikita	20	0	4859236	614932	284556	S	15.1	3.8	46:24.26	firefox
13158	nikita	20	0	3309584	469896	118980	S	1.3	2.9	2:38.63	Web Content
13115	nikita	20	0	3333892	421008	125092	S	0.3	2.6	0:44.64	Web Content
2284	nikita	20	0	4773548	378184	125372	S	25.3	2.3	10:11.10	gnome-shell
3574	nikita	20	0	3201852	359572	107604	S	27.3	2.2	46:38.33	Web Content
3346	nikita	20	0	8729696	352776	21712	S	0.3	2.2	1:03.52	java
3161	nikita	20	0	54.677g	348648	113580	S	0.3	2.1	6:18.25	code
3538	nikita	20	0	3206160	329356	110848	S	33.2	2.0	51:48.77	Web Content
2724	nikita	20	0	3198172	318968	121004	S	0.3	2.0	1:51.59	Web Content
11483	nikita	20	0	2048604	302528	170608	S	0.0	1.9	1:00.61	soffice.bin
2783	nikita	20	0	3111720	299600	84360	S	0.3	1.8	1:35.77	WebExtensions
2853	nikita	20	0	2983684	292544	111716	S	1.0	1.8	2:29.73	Web Content
13219	nikita	20	0	2950124	235000	98092	S	0.0	1.4	0:12.18	Web Content
1113	gdm	20	0	6394388	197020	127656	S	0.0	1.2	0:29.84	gnome-shell
2911	nikita	20	0	1348588	178704	36548	S	0.0	1.1	0:03.58	gnome-software
10348	nikita	20	0	2773584	168788	130692	S	2.6	1.0	2:40.88	Web Content
14013	nikita	20	0	177836	167156	3296	S	3.0	1.0	0:01.41	a.out

Problem 4:

a)