

A) Demo: 05/21/2020, 10:45~11:00, TA: Jonathan Dressel

B) Test Cases

Setting	User Input	Expected Result	Actual Result
Welcome to the Steak House Restaurant! How many diners in your party(1~25)?	0	Invalid size; Please enter a number between 1 and 25:	Invalid size; Please enter a number between 1 and 25:
Welcome to the Steak House Restaurant! How many diners in your party(1~25)?	100	Invalid size; Please enter a number between 1 and 25:	Invalid size; Please enter a number between 1 and 25:
Welcome to the Steak House Restaurant! How many diners in your party(1~25)?	3	Diner 1, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:	Diner 1, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:
Diner 1, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:	4	Diner 2, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:	Diner 2, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:
Diner 1, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:	2	Diner 3, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:	Diner 3, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:
Diner 1, please make your choice: 1)Tenderloin Steak: \$15.85 2) Sirloin Steak: \$14.65 3) T-bone Steak: \$21.75 4) Tomahawk Steak: \$30.55 Enter:	1	I hope your dinner was delicious! Do you want to give a tip (y/n)?	I hope your dinner was delicious! Do you want to give a tip (y/n)?

C) The actual time that I spent to finish the implementation was about 2 hours. Before the implementation in design document, I estimated that it will take about 4 hours, but actually it only took the half of it.

D) The output from running valgrind on my final program

```
==5476== Memcheck, a memory error detector
```

```
==5476== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
```

```
==5476== Using Valgrind-3.14.0 and LibVEX; rerun with -h for copyright info
```

```
==5476== Command: assign4_restaurant
```

```
==5476==
```

```
Welcome to the Steak House Restaurant!
```

```
How many diners in your party (1~25)?
```

```
Enter: 1
```

```
1 Tenderloin Steak: $15.85
```

```
2 Sirloin Steak: $14.65
```

```
3 T-bone Steak: $21.75
```

```
4 Tomahawk Steak: $30.55
```

```
Enter: 1
```

```
I hope your dinner was delicious!
```

```
Do you want to give a tip (y/n)? y
```

```
Tip: $10
```

```
The bill for your delightful meal:
```

```
Diner1 Tenderloin Steak: $15.85
```

```
Total amount: $25.85
```

Welcome to the Steak House Restaurant!

How many diners in your party (1~25)?

Enter: ^C==5476==

==5476== Process terminating with default action of signal 2 (SIGINT)

==5476== at 0x5745950: __read_nocancel (syscall-template.S:81)

==5476== by 0x56D1C73: _IO_file_underflow@@GLIBC_2.2.5 (fileops.c:593)

==5476== by 0x56D2E41: _IO_default_uflow (genops.c:414)

==5476== by 0x56CD6AD: getc (getc.c:39)

==5476== by 0x4ECC1BC: syncgetc (stdio_sync_filebuf.h:195)

==5476== by 0x4ECC1BC: __gnu_cxx::stdio_sync_filebuf<char, std::char_traits<char>
>::underflow() (stdio_sync_filebuf.h:103)

==5476== by 0x4EB59E1: sgetc (basic_ios.h:174)

==5476== by 0x4EB59E1: snextc (streambuf:303)

==5476== by 0x4EB59E1: std::istream::sentry::sentry(std::istream&, bool) (istream.tcc:65)

==5476== by 0x4EB5C5A: std::istream::operator>>(int&) (istream.tcc:171)

==5476== by 0x401746: main (in
/nfs/stak/users/kimh6/assignments/assign4_restaurant/assign4_restaurant)

==5476==

==5476== HEAP SUMMARY:

==5476== in use at exit: 155 bytes in 4 blocks

==5476== total heap usage: 6 allocs, 2 frees, 216 bytes allocated

==5476==

==5476== LEAK SUMMARY:

==5476== definitely lost: 0 bytes in 0 blocks

==5476== indirectly lost: 0 bytes in 0 blocks

==5476== possibly lost: 0 bytes in 0 blocks

```
==5476==      still reachable: 155 bytes in 4 blocks
==5476==
==5476==      of which reachable via heuristic:
==5476==      stdstring      : 155 bytes in 4 blocks
==5476==      suppressed: 0 bytes in 0 blocks
==5476== Rerun with --leak-check=full to see details of leaked memory
==5476==
==5476== For counts of detected and suppressed errors, rerun with: -v
==5476== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

- E) The dynamic array is helpful when the size of the array is not determined in the program and the user of the program is allowed to decide the size of the array. For instance, in `assign4_restaurant.cpp`, the size of the array that stores the choice of the user is not determined at first. After the user decides the size of the array, the program runs with the determined size of the array and then resets it. Therefore, dynamic array is used when we run the program that is influenced by the choice of the user.
- F) The hardest part of this assignment was setting dynamic array in this program. It was what I expected before implementation because the concept and implementation of dynamic array was new for me. Thus, it took some time to understand and use the dynamic array in this program.

<Extra Credit>

1. Split the bill

Welcome to the Steak House Restaurant!

How many diners in your party (1~25)?

Enter: 4

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 1

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 2

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 3

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 4

I hope your dinner was delicious!

Do you want to give a tip (y/n)? n

The bill for your delightful meal:

Diner1 Tenderloin Steak: \$15.85

Diner2 Sirloin Steak: \$14.65

Diner3 T-bone Steak: \$21.75

Diner4 Tomahawk Steak: \$30.55

Do you want to split the bill (y/n)? y

Total amount: \$82.8

Each: \$20.7

2. Adding a loop so that the restaurant can handle more than one party

<code>

```
while(true){  
    intro();  
  
    cin >> diners;  
  
    invalid_input(diners,1,25);  
  
    int*choice = choices(menus,prices,&diners,restaurant);  
  
    delete [] choice;  
  
    choice = NULL;  
  
}
```

<Result>

Welcome to the Steak House Restaurant!

How many diners in your party (1~25)?

Enter: 1

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 9

Invalid Order; Please enter a number between 1 and 4:

Enter: 1

I hope your dinner was delicious!

Do you want to give a tip (y/n)? n

The bill for your delightful meal:

Diner1 Tenderloin Steak: \$15.85

Welcome to the Steak House Restaurant!

How many diners in your party (1~25)?

Enter: 8

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 1

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 2

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 3

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 4

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 1

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 2

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 3

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 4

I hope your dinner was delicious!

Do you want to give a tip (y/n)? n

The bill for your delightful meal:

Diner1 Tenderloin Steak: \$15.85

Diner2 Sirloin Steak: \$14.65

Diner3 T-bone Steak: \$21.75

Diner4 Tomahawk Steak: \$30.55

Diner5 Tenderloin Steak: \$15.85

Diner6 Sirloin Steak: \$14.65

Diner7 T-bone Steak: \$21.75

Diner8 Tomahawk Steak: \$30.55

Do you want to split the bill (y/n)? n

Total amount: \$165.6

Welcome to the Steak House Restaurant!

How many diners in your party (1~25)?

Enter: 12

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 1

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 2

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 3

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 4

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 1

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 2

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 3

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 4

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 1

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 2

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 3

1 Tenderloin Steak: \$15.85

2 Sirloin Steak: \$14.65

3 T-bone Steak: \$21.75

4 Tomahawk Steak: \$30.55

Enter: 4

I hope your dinner was delicious!

Do you want to give a tip (y/n)? n

The bill for your delightful meal:

Diner1 Tenderloin Steak: \$15.85

Diner2 Sirloin Steak: \$14.65

Diner3 T-bone Steak: \$21.75

Diner4 Tomahawk Steak: \$30.55

Diner5 Tenderloin Steak: \$15.85

Diner6 Sirloin Steak: \$14.65

Diner7 T-bone Steak: \$21.75

Diner8 Tomahawk Steak: \$30.55

Diner9 Tenderloin Steak: \$15.85

Diner10 Sirloin Steak: \$14.65

Diner11 T-bone Steak: \$21.75

Diner12 Tomahawk Steak: \$30.55

Do you want to split the bill (y/n)? n

Total amount: \$248.4

Welcome to the Steak House Restaurant!

How many diners in your party (1~25)?

Enter:

-
-
3. I would recommend to use color codes in the name of the dishes in order to make the program much more entertaining and recognizable.