

This document has been created to help you organize the screenshots you need to capture to demonstrate the completion of your project. When you are done with all screenshots, download this document as a PDF file and upload it to your [final project repl](#).

Menu-driven User Interface:

In the following space, capture screenshot(s) that demonstrate your program has a nice menu-driven user interface that allows users to repeatedly choose different options until they are ready to exit.

```
> clang++-7 -pthread -std=c++17 -o main library.cpp main.cpp
> ./main
Welcome. This program deals with data about top otome games.
The source is: https://w.atwiki.jp/ggirlurlpage/sp/pages/14.html#IdA-1

Choose an option:
a. display all
b. sort
c. remove
d. analysis
e. filter by console
any other key to exit: a

=====
Name           Console   Total Sales  Week 1 Sales  Character1      Character2      Character3      Character4      Character5      Character6
=====
TMGS 3rd Story  DS        173949       64639        Ruka Sakurai   Koudichi Sakurai Arashi Fujiyama Junpei Niina    Tamao Konno    Seiji Shitara
TMGS 2nd Season DS        163943       56292        Teru Saeki     Katsumi Shiba  Itaru Hikami   Kounoshin Hariya Motoharu Masaki Shota Awachi
Uta no Prince-sama Repeat PSP      144555       32189        Ittoki Otoya   Hijirikawa Masato Shinomiya Natsuki Ichinose Tokiya Jinguji Ren    Kurusu Syo
Uta no Prince-sama All Star PSP      111898       87217        Kotobuki Reiji Kurosaki Ranmaru Mikaze Ai       Iitoki Otoya    Tsukimiyu Kingo Hyuga Ryuya
Hakuouki Portable PSP      111633       16764        Toshiro Hijikata Souji Okita     Hajime Saito    Heisuke Toudou  Sanosuke Harada Chikage Kazama
Tokimeki Memorial Girl's Side PS2      118628       34591        Hikaru Midorikawa Sakuya Morimura Kazuma Suzuka   Madoka Kijo     Shiki Mihara   Reichi Himuro  Kotobuki Reiji
Uta no Prince-sama MUSIC2 PSP      94145        68415        Ittoki Otoya   Jinguji Ren     Kurusu Syo     Aijima Cecil    Mikaze Ai       Jinguji Ren    Kurusu Syo
Uta no Prince-sama Debut PSP      91247        68617        Ittoki Otoya   Hijirikawa Masato Shinomiya Natsuki Ichinose Tokiya Jinguji Ren    Kurusu Syo
Hakuouki DS    DS        79328       14921        Toshiro Hijikata Souji Okita     Hajime Saito    Heisuke Toudou  Sanosuke Harada Shipachi Nagakura
Golden Corda 2 PS2      46675       35914        Ren Tsukimori  Keiichi Shimizu Hiwara Kazuki   Yuki Azusama    Aoi Kaji       Akihiko Kira

Choose an option:
a. display all
b. sort
c. remove
d. analysis
e. filter by console
any other key to exit: 
```

Tabular Display of the original data:

In the following space, capture screenshot(s) that demonstrate your program is able to display the original collection in a nice tabular format.

```
> clang++-7 -pthread -std=c++17 -o main library.cpp main.cpp
> ./main
Welcome. This program deals with data about top otome games.
The source is: https://w.atwiki.jp/ggirlurlpage/sp/pages/14.html#IdA-1

Choose an option:
a. display all
b. sort
c. remove
d. analysis
e. filter by console
any other key to exit: a

=====
Name           Console   Total Sales  Week 1 Sales  Character1      Character2      Character3      Character4      Character5      Character6
=====
TMGS 3rd Story  DS        173949       64639        Ruka Sakurai   Koudichi Sakurai Arashi Fujiyama Junpei Niina    Tamao Konno    Seiji Shitara
TMGS 2nd Season DS        163943       56292        Teru Saeki     Katsumi Shiba  Itaru Hikami   Kounoshin Hariya Motoharu Masaki Shota Awachi
Uta no Prince-sama Repeat PSP      144555       32189        Ittoki Otoya   Hijirikawa Masato Shinomiya Natsuki Ichinose Tokiya Jinguji Ren    Kurusu Syo
Uta no Prince-sama All Star PSP      111898       87217        Kotobuki Reiji Kurosaki Ranmaru Mikaze Ai       Iitoki Otoya    Tsukimiyu Kingo Hyuga Ryuya
Hakuouki Portable PSP      111633       16764        Toshiro Hijikata Souji Okita     Hajime Saito    Heisuke Toudou  Sanosuke Harada Chikage Kazama
Tokimeki Memorial Girl's Side PS2      118628       34591        Hikaru Midorikawa Sakuya Morimura Kazuma Suzuka   Madoka Kijo     Shiki Mihara   Reichi Himuro  Kotobuki Reiji
Uta no Prince-sama MUSIC2 PSP      94145        68415        Ittoki Otoya   Jinguji Ren     Kurusu Syo     Aijima Cecil    Mikaze Ai       Jinguji Ren    Kurusu Syo
Uta no Prince-sama Debut PSP      91247        68617        Ittoki Otoya   Hijirikawa Masato Shinomiya Natsuki Ichinose Tokiya Jinguji Ren    Kurusu Syo
Hakuouki DS    DS        79328       14921        Toshiro Hijikata Souji Okita     Hajime Saito    Heisuke Toudou  Sanosuke Harada Shipachi Nagakura
Golden Corda 2 PS2      46675       35914        Ren Tsukimori  Keiichi Shimizu Hiwara Kazuki   Yuki Azusama    Aoi Kaji       Akihiko Kira

Choose an option:
a. display all
b. sort
c. remove
d. analysis
e. filter by console
any other key to exit: 
```

Filtered display:

In the following space, capture screenshot(s) that demonstrate your program is able to request necessary data from users and display a portion of the original collection according to the user

entries.

```
Choose an option:
a. display all
b. sort
c. remove
d. analysis
e. filter by console
any other key to exit: e
Please type in the console you would like to filter by (ex. DS, PSP, PS2): DS
=====
Name      Console  Total Sales  Week 1 Sales  Character1      Character2      Character3      Character4      Character5      Character6
=====
TMGS 3rd Story  DS      173049      64630      Ruka Sakurai   Kouichi Sakurai Azashi Fujiyama Junpei Niina   Tamao Konno   Seiji Shitara
TMGS 2nd Season DS      163943      56202      Teru Saeki     Katsumi Shiba  Itaru Hikami   Kounoshin Hariya Motoharu Masaki Shota Amachi
Hakuouki DS    79318     14921      Toshizo Hijikata Souji Okita     Hajime Saito   Heisuke Toudou  Sanosuke Harada Shinpachi Nagakura

Choose an option:
a. display all
Please type in the console you would like to filter by (ex. DS, PSP, PS2): PS2
=====
Name      Console  Total Sales  Week 1 Sales  Character1      Character2      Character3      Character4      Character5      Character6
=====
Tokimeki Memorial Girl's Side PS2  110628     34591      Hikaru Midorikawa Sakuya Morimura Kazuma Suzuki   Madoka Kijo    Shiki Mihara   Reichi Himuro
Golden Corda 2  PS2      46675     35914      Ren Tsukimori   Keiichi Shimizu Hihiara Kazuki  Yuki Azusama   Aoi Kaji       Akihiko Kira

Choose an option:
```

Sorted display:

In the following space, capture screenshot(s) that demonstrate your program is able to rearrange the collection of data using a different sorting criterion than how the data are originally arranged in the input file.

```
After sorting by game title in alphabetical order
=====
Name      Console  Total Sales  Week 1 Sales  Character1      Character2      Character3      Character4      Character5      Character6
=====
Golden Corda 2  PS2      46675     35914      Ren Tsukimori   Keiichi Shimizu Hihiara Kazuki  Yuki Azusama   Aoi Kaji       Akihiko Kira
Hakuouki DS    79318     14921      Toshizo Hijikata Souji Okita     Hajime Saito   Heisuke Toudou  Sanosuke Harada Shinpachi Nagakura
Hakuouki Portable PSP      111633     16764      Toshizo Hijikata Souji Okita     Hajime Saito   Heisuke Toudou  Sanosuke Harada Chikage Kazama
TMGS 2nd Season DS      163943     56202      Teru Saeki     Katsumi Shiba  Itaru Hikami   Kounoshin Hariya Motoharu Masaki Shota Amachi
TMGS 3rd Story  DS      173049     64630      Ruka Sakurai   Kouichi Sakurai Azashi Fujiyama Junpei Niina   Tamao Konno   Seiji Shitara
Tokimeki Memorial Girl's Side PS2  110628     34591      Hikaru Midorikawa Sakuya Morimura Kazuma Suzuki   Madoka Kijo    Shiki Mihara   Reichi Himuro
Uta no Prince-sama All Star PSP      123898     67217      Kotobuki Reiji  Hijirikawa Masato Shinomiya Natsuki Ichinose Tokiya Jinguji Ren    Kurusu Syo
Uta no Prince-sama Debut PSP      91247     68617      Ittoki Otoyaa  Jinguji Ren     Kurusu Syo     Aijima Cecil   Mikaze Ai       Kotobuki Reiji
Uta no Prince-sama MUSIC2 PSP      94145     68415      Ittoki Otoyaa  Jinguji Ren     Kurusu Syo     Aijima Cecil   Mikaze Ai       Kotobuki Reiji
Uta no Prince-sama Repeat PSP      144555     32180      Ittoki Otoyaa  Jinguji Ren     Kurusu Syo     Aijima Cecil   Mikaze Ai       Kotobuki Reiji

Choose an option:
```

Analysis within a struct object:

In the following space, capture screenshot(s) that demonstrate your program is able to provide an analysis on a given struct object based on user interest.

```
Choose an option:
a. display all
b. sort
c. remove
d. analysis
e. filter by console
any other key to exit: d
This is the percentage of sales that the 1st Week Sales takes up of the total sales
=====
Name      Total Sales  Week 1 Sales  Wk1 % of Total Sales
=====
Golden Corda 2  46675      35914      76.94%
Hakuouki DS    79318      14921      18.81%
Hakuouki Portable 111633     16764      15.02%
TMGS 2nd Season 163943     56202      34.28%
TMGS 3rd Story  173049     64630      37.35%
Tokimeki Memorial Girl's Side 110628     34591      31.27%
Uta no Prince-sama All Star 111898     67217      60.07%
Uta no Prince-sama Debut 91247      68617      75.20%
Uta no Prince-sama MUSIC2 94145      68415      72.67%
Uta no Prince-sama Repeat 144555     32180      22.26%

The most common console in the list of top-selling otomes is PSP
```

Analysis across multiple struct objects:

In the following space, capture screenshot(s) that demonstrate your program is able to provide an analysis of multiple struct objects based on user interest.

```
Choose an option:
a. display all
b. sort
c. remove
d. analysis
e. filter by console
any other key to exit: d
This is the percentage of sales that the 1st Week Sales takes up of the total sales
Name          Total Sales   Week 1 Sales   Wk1 % of Total Sales
=====
Golden Corda 2      46675        35914         76.94%
Hakuouki DS         79318        14921         18.81%
Hakuouki Portable   111633       16764         15.02%
TMGS 2nd Season     163943       56202         34.28%
TMGS 3rd Story      173049       64630         37.35%
Tokimeki Memorial Girl's Side 110628      34591         31.27%
Uta no Prince-sama All Star 111898       67217         60.07%
Uta no Prince-sama Debut  91247        68617         75.20%
Uta no Prince-sama MUSIC2  94145        68415         72.67%
Uta no Prince-sama Repeat 144555       32180         22.26%

The most common console in the list of top-selling otomes is PSP
```

Remove an object from the original collection:

In the following space, capture screenshot(s) that demonstrate your program is able to remove an object from the original collection based on user request. It is important to perform the following test cases for this feature.

- The element to be removed is the first in the array.
- The element to be removed is somewhere in the middle of the array.
- The element to be removed is the last in the array.
- The element to be removed is not in the array.

```
Enter name of game you want to remove. Please type the title exactly as you see it. TMGS 3rd Story
After removing TMGS 3rd Story
Name          Console   Total Sales   Week 1 Sales   Character1      Character2      Character3      Character4      Character5      Character6
=====
Uta no Prince-sama Repeat  PSP      144555       32180         Ittoki Otoyra   Hijirikawa Masato  Shinomiya Natsuki  Ichinose Tokiya  Jinguji Ren     Motosharu Masaki
Uta no Prince-sama All Star  PSP      111633       16764         Kotobuki Reiji  Kurosaki Rammaru  Mikaze Ai          Ittoki Otoyra   Tsukimiyu Ringo  Hyuga Ryuya
Hakuouki Portable   PSP      111633       16764         Toshizo Hijikata  Souji Okita      Hajime Saito      Heisuke Toudou  Sanosuke Harada  Chikage Kazama
Tokimeki Memorial Girl's Side  PS2      110628       34591         Hikaru Midorikawa  Jinguji Ren     Kazuma Suzuka      Madoka Kijo      Shiki Mihara     Reichi Himuro
Uta no Prince-sama MUSIC2  PSP      94145        68415         Ittoki Otoyra   Hijirikawa Masato  Shinomiya Natsuki  Ichinose Tokiya  Aijima Cecil      Mikaze Ai        Kotobuki Reiji
Uta no Prince-sama Debut  PSP      91247        68617         Ittoki Otoyra   Hijirikawa Masato  Shinomiya Natsuki  Ichinose Tokiya  Jinguji Ren     Kuzusu Syo
Hakuouki DS         DS        79318        14921         Toshizo Hijikata  Souji Okita      Hajime Saito      Heisuke Toudou  Sanosuke Harada  Shinpachi Nagakura
Golden Corda 2      PS2       46675        35914         Ren Tsukimori    Keiichi Shimizu   HiHara Kazuki     Yuki Arusama     Aoi Kaji         Akihiko Kira

Press any option:

Enter name of game you want to remove. Please type the title exactly as you see it. Hakuouki Portable
After removing Hakuouki Portable
Name          Console   Total Sales   Week 1 Sales   Character1      Character2      Character3      Character4      Character5      Character6
=====
TMGS 2nd Season     DS        163943       56202         Teru Saeki      Katsumi Shiba    Itaru Hikami      Kounoshin Hariya  Motosharu Masaki  Shota Amachi
Uta no Prince-sama Repeat  PSP      144555       32180         Ittoki Otoyra   Hijirikawa Masato  Shinomiya Natsuki  Ichinose Tokiya  Jinguji Ren     Kuzusu Syo
Uta no Prince-sama All Star  PSP      111898       67217         Kotobuki Reiji  Kurosaki Rammaru  Mikaze Ai          Ittoki Otoyra   Tsukimiyu Ringo  Hyuga Ryuya
Tokimeki Memorial Girl's Side  PS2      110628       34591         Hikaru Midorikawa  Jinguji Ren     Kazuma Suzuka      Madoka Kijo      Shiki Mihara     Reichi Himuro
Uta no Prince-sama MUSIC2  PSP      94145        68415         Ittoki Otoyra   Hijirikawa Masato  Shinomiya Natsuki  Ichinose Tokiya  Aijima Cecil      Mikaze Ai        Kotobuki Reiji
Uta no Prince-sama Debut  PSP      91247        68617         Ittoki Otoyra   Hijirikawa Masato  Shinomiya Natsuki  Ichinose Tokiya  Jinguji Ren     Kuzusu Syo
Hakuouki DS         DS        79318        14921         Toshizo Hijikata  Souji Okita      Hajime Saito      Heisuke Toudou  Sanosuke Harada  Shinpachi Nagakura
Golden Corda 2      PS2       46675        35914         Ren Tsukimori    Keiichi Shimizu   HiHara Kazuki     Yuki Arusama     Aoi Kaji         Akihiko Kira
```

Enter name of game you want to remove. Please type the title exactly as you see it. Golden Corda 2

After removing Golden Corda 2

Name	Console	Total Sales	Week 1 Sales	Character1	Character2	Character3	Character4	Character5	Character6
TMGS 2nd Season	DS	163943	56202	Teru Saeki	Katsumi Shiba	Itaru Hikami	Kounoshin Hariya	Motoharu Masaki	Shota Amachi
Uta no Prince-sama Repeat	PSP	144555	32480	Ittoki Otoya	Hijirikawa Masato	Shinomiya Natsuki	Ichinose Tokiya	Jinguji Ren	Kurusu Syo
Uta no Prince-sama All Star	PSP	111898	67217	Kotobuki Reiji	Kurosaki Raimaru	Mikaze Ai	Ittoki Otoya	Tsukimiyu Ringo	Hyuga Ryuya
Tokimeki Memorial Girl's Side	PS2	118628	34591	Hikaru Midorikawa	Sakuya Morimura	Kazuma Suzuka	Madoka Kijo	Shiki Mihara	Reiichi Himuro
Uta no Prince-sama MUSIC2	PSP	94145	68415	Ittoki Otoya	Jinguji Ren	Kurusu Syo	Aijima Cecil	Mikaze Ai	Kotobuki Reiji
Uta no Prince-sama Debut	PSP	91247	68617	Ittoki Otoya	Hijirikawa Masato	Shinomiya Natsuki	Ichinose Tokiya	Jinguji Ren	Kurusu Syo
Hakuouki DS	DS	79318	14921	Toshizo Hijikata	Souji Okita	Hajime Saito	Heisuke Toudou	Sanosuke Harada	Shinpachi Nagakura

Choose an option:

Enter name of game you want to remove. Please type the title exactly as you see it. as
Game not found. Please enter correctly or ensure the game entered is in the list.

Name	Console	Total Sales	Week 1 Sales	Character1	Character2	Character3	Character4	Character5	Character6
TMGS 3rd Story	DS	173849	64630	Ruka Sakurai	Kouichi Sakurai	Arashi Fujiyama	Junpei Niina	Tamao Konno	Seiji Shitara
TMGS 2nd Season	DS	163943	56202	Teru Saeki	Katsumi Shiba	Itaru Hikami	Kounoshin Hariya	Motoharu Masaki	Shota Amachi
Uta no Prince-sama Repeat	PSP	144555	32480	Ittoki Otoya	Hijirikawa Masato	Shinomiya Natsuki	Ichinose Tokiya	Jinguji Ren	Kurusu Syo
Uta no Prince-sama All Star	PSP	111898	67217	Kotobuki Reiji	Kurosaki Raimaru	Mikaze Ai	Ittoki Otoya	Tsukimiyu Ringo	Hyuga Ryuya
Hakuouki Portable	PSP	111633	16764	Toshizo Hijikata	Souji Okita	Hajime Saito	Heisuke Toudou	Sanosuke Harada	Chikage Kazama
Tokimeki Memorial Girl's Side	PS2	118628	34591	Hikaru Midorikawa	Sakuya Morimura	Kazuma Suzuka	Madoka Kijo	Shiki Mihara	Reiichi Himuro
Uta no Prince-sama MUSIC2	PSP	94145	68415	Ittoki Otoya	Jinguji Ren	Kurusu Syo	Aijima Cecil	Mikaze Ai	Kotobuki Reiji
Uta no Prince-sama Debut	PSP	91247	68617	Ittoki Otoya	Hijirikawa Masato	Shinomiya Natsuki	Ichinose Tokiya	Jinguji Ren	Kurusu Syo
Hakuouki DS	DS	79318	14921	Toshizo Hijikata	Souji Okita	Hajime Saito	Heisuke Toudou	Sanosuke Harada	Shinpachi Nagakura
Golden Corda 2	PS2	46675	35914	Ren Tsukimori	Keiichi Shimizu	Mihara Kazuki	Yuki Azusama	Aoi Kaji	Akihiko Kira