Politechnika Śląska

Wydział Automatyki, Elektroniki i Informatyki

Programowanie Komputerów 2

Pasjans / Klondike

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Rodzaj studiów	SSI
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Termin laboratorium	Środa, parzysta, 13:30 – 15:00
Sekcja	62
Termin oddania sprawozdania	2023-09-01

1 Treść zadania

Napisać program w języku C++, który będzie wzorowany na klasycznej grze karcianej pasjans. W grze użytkownik może zalogować się na swoje konto, a następnie rozpocząć rozgrywkę, starając się uzyskać jak najwyższy wynik punktowy.

2 Analiza zadania

Zagadnienie przedstawia konstrukcję programu „Pasjans", który został napisany w języku C++ z wykorzystaniem biblioteki graficznej SFML służącej do wyświetlania programu. Obsługuje ona akcelerację sprzętową grafiki 2D przy użyciu OpenGL.

2.1 Struktury danych

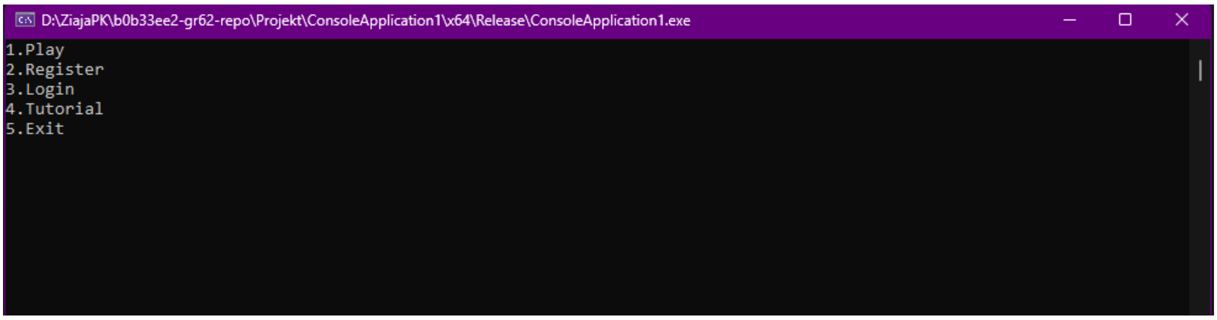
Program napisany jest obiektowo, a więc opiera się na klasach. Najważniejsze z nich to klasa „Stack" oraz klasy po niej dziedziczące i klasa „Card". Każdy istniejący stos zawiera swój wektor kart, dzięki temu możliwa jest łatwa implementacja metod, które powodują odziaływanie kart między sobą. Stosy i karty dziedziczą również po klasie „drawable" należącej do biblioteki SFML i umożliwiającej rysowanie obiektów. Z tych oraz wielu innych klas korzysta główna klasa „Klondike", jest w niej zawarta główna pętla gry.

2.2 Algorytmy

Większość algorytmów zawartych w programie znajduje się w statycznej metodzie Game klasy Klondike. To w niej zawiera się główna pętla gry. Algorytmy te definiują poprawne przenoszenie kart między każdym ze stosów zgodnie z zasadami gry Pasjans. Dodatkowo metody w klasie „Shuffle" odpowiadają za poprawne generowanie i tasowanie talii kart.

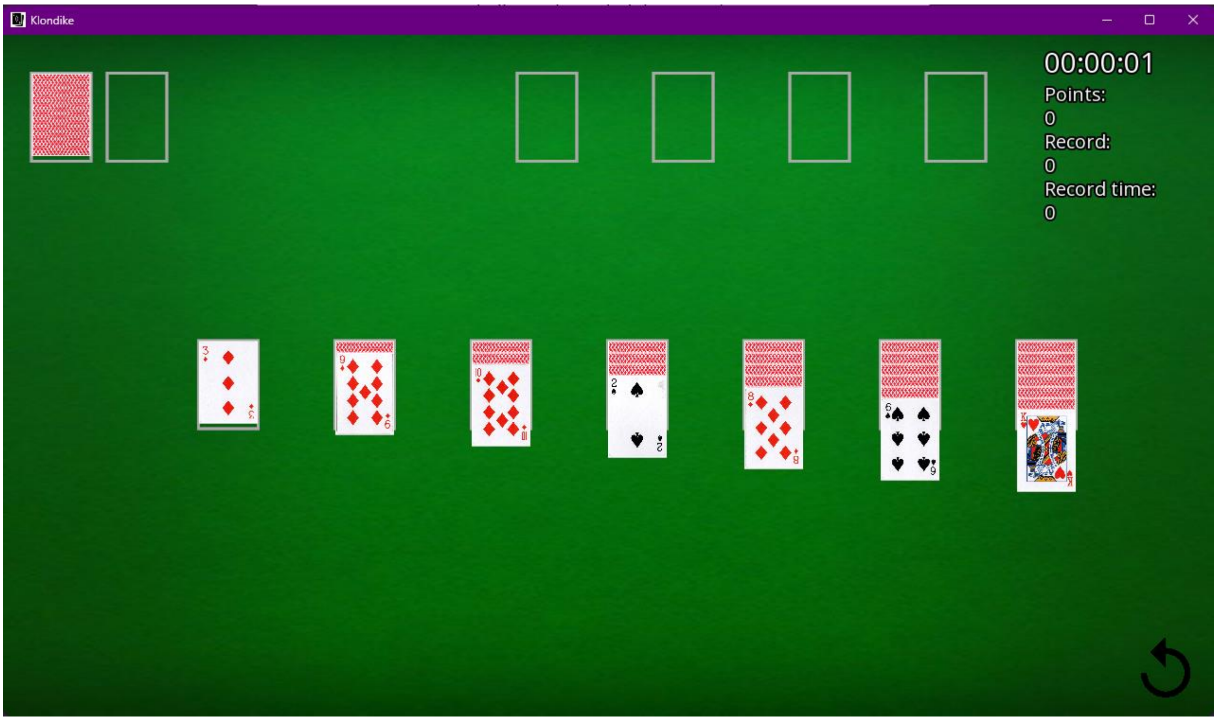
3 Specyfikacja zewnętrzna

Uruchomienie programu spowoduje pojawienie się menu w konsoli. Użytkownik ma w nim możliwość rejestracji, logowania, wyświetlenia tutorialu(instrukcji gry) oraz rozpoczęcia rozgrywki, a także wyjścia z programu.


D:\ZiajaPK\b0b33ee2-gr62-repo\Projekt\ConsoleApplication1\x64\Release\ConsoleApplication1.exe

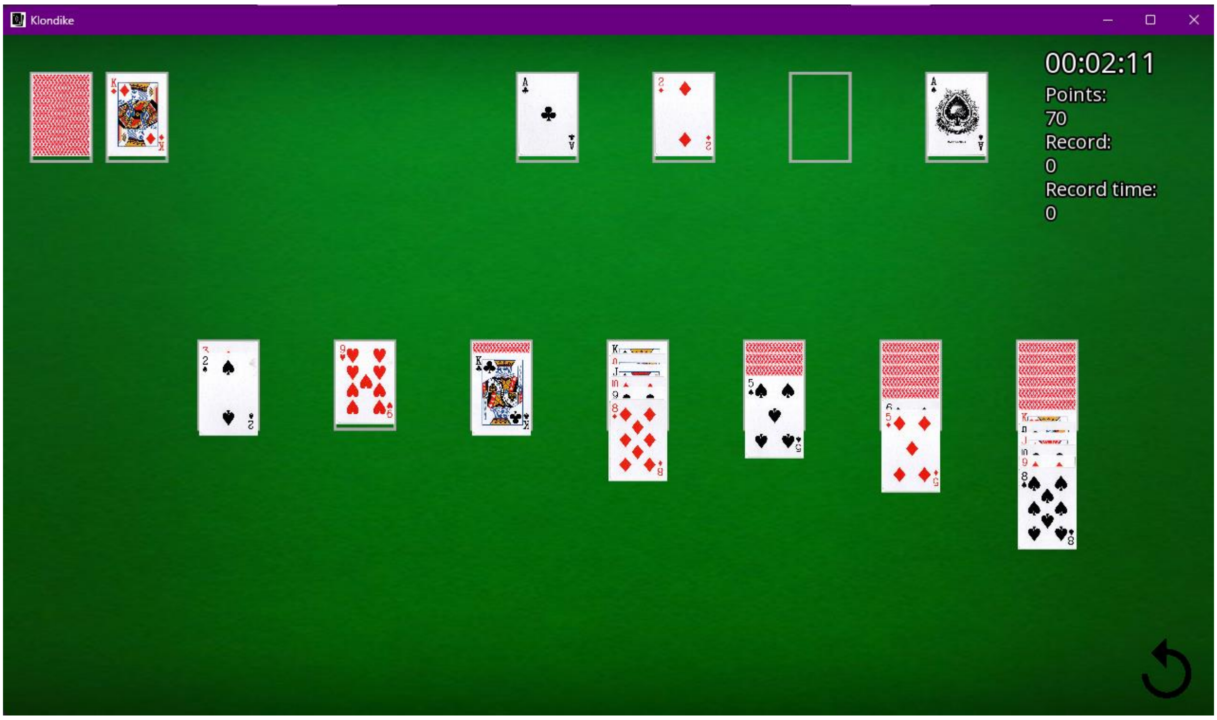
```
1.Play
2.Register
3.Login
4.Tutorial
5.Exit
```

Rysunek 1: Menu programu.



Rysunek 2: Przykładowe początkowe pseudo-losowe ułożenie kart.

Wraz z rozpoczęciem rozgrywki zaczyna naliczać się czas. Oprócz bieżącego czasu wyświetlane są informacje takie jak: aktualna liczba zdobytych punktów, punktowy rekord użytkownika, oraz rekordowy czas ułożenia talii przez użytkownika. Chcąc chwycić kartę klikamy ją lewym przyciskiem myszy, oraz prawym by ją zwolnić (umieścić w innym miejscu). Niepoprawny ruch poskutkuje wolnieniem karty bez zmiany jej położenia. Gracz ma też możliwość cofania ruchów za pomocą przycisku w dolnym prawym rogu ekranu. Więcej informacji o ruchach oraz punktacji zawartych jest w tutorialu uruchamianego z poziomu menu. Gra kończy się gdy gracz ułoży wszystkie karty na stosach zbierających. Po skończonej grze wyświetli się okienko z gratulacjami, którego zamknięcie spowoduje zakończenie gry.



Rysunek 3: Plansza w trakcie rozgrywki.

4 Specyfikacja wewnętrzna

Program został zrealizowany zgodnie z obowiązującymi zasadami programowania obiektowego w języku C++. W programie rozdzielono interfejs (wygląd planszy i kart) od logiki aplikacji (ustawianie kart oraz ich ruchy).

4.1 Ogólna struktura programu

W funkcji głównej programu po wybraniu opcji Play, uaktywnia się nieskończona pętla, która będzie działać, dopóki każdy ze stosów zbierających nie będzie zawierał wektora z trzynastoma kartami. Metoda Game jest odpowiedzialna za odpowiednie uaktywnianie innych metod. Metoda setCards odpowiada za początkowe ustawienie kart na planszy. Reszta algorytmów znajduję się bezpośrednio w metodzie Game. Określają one przemieszczenia kart oraz obsługę przycisku cofającego ruchy. Oprócz tego metoda Game wywołuje metody rejestrujące i logujące użytkownika.

4.2 Szczegółowy opis typów i funkcji

Szczegółowy opis klas i metod zawarty jest w dokumentacji wygenerowanej przez doxygen.

5 Testowanie

Program został przetestowany dla różnych wygenerowanych talii kart. Zostało sprawdzona czy gra poprawnie przenosi karty między stosami niezależnie od kolejności ich generowania. Sprawdzono również system naliczania punktów podczas przenoszenia kart i analogicznie odejmowania ich podczas cofania ruchów. Po zakończonych testach stwierdzono, że program działa bezproblemowo i nie posiada błędów.

Program został sprawdzony pod kątem wycieków pamięci.

6 Wnioski

Aplikacja Pasjans jest programem złożonym wewnętrznie, lecz czytelnym i zrozumiałym dla osób ze znajomością języka C++. Zarówno projekt jak i dokumentacja wygenerowana przez doxygen napisane są w języku angielskim, którego znajomość jest wymagana do prawidłowego zrozumienia struktury programu. Implementacja biblioteki graficznej SFML sprawiała małe trudności, ale ogółem rzecz biorąc jest łatwa i wygodna w obsłudze. Najwięcej problemów sprawiało prawidłowe zaimplementowanie ruchów kart zgodnie z logiką gry. Zdecydowanie zalecam wcześniejszą znajomość zarówno języka C++ jak i samej karcianki, zanim ktokolwiek powoła się na napisanie takiego projektu, niezwykle to pomaga. Sam projekt dostarczył mi wielu cennych lekcji oraz poszerzył moje umiejętności związane z programowaniem obiektowym w języku C++.

Literatura

https://youtube.com/playlist?list=PLk6mhiZKpyW4KRTZc8sc0aYOLFmTSLA7r

https://www.sfml-dev.org/index.php

Szczegółowy opis klas i funkcji - doxygen

Klondike

Generated by Doxygen 1.9.7

Chapter 1

Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 3

File Index

3.1 File List

Here is a list of all files with brief descriptions:

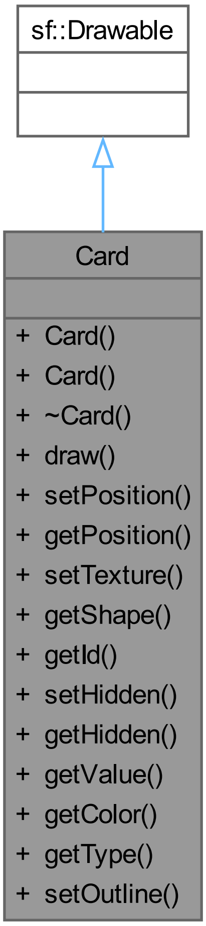
Chapter 4

Class Documentation

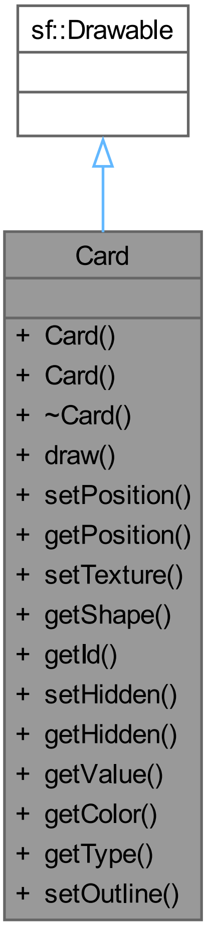
4.1 Card Class Reference

```
#include <Card.h>
```

Inheritance diagram for Card:



Collaboration diagram for Card:



Public Member Functions

- Card ()
- Card (int index, int value, std::string Color, std::string Type, std::string texturePath)
- ∼Card ()=default
- void draw (RenderTarget &target, RenderStates state) const override
- void setPosition (float X, float Y)
- std::pair< float, float > getPosition ()
- void setTexture ()
- RectangleShape getShape ()
- int getId ()
- void setHidden (const bool i)
- bool getHidden ()
- int getValue ()
- std::string getColor ()
- std::string getType ()
- void setOutline ()

4.1.1 Constructor & Destructor Documentation

4.1.1.1 Card() [1/2]

```
Card::Card ( )
```

Card basic constructor

4.1.1.2 Card() [2/2]

```
Card::Card (
             int index,
             int value,
             std::string Color,
             std::string Type,
             std::string texturePath )
```

Card constructor

4.1.1.3 ∼Card()

```
Card::∼Card ( ) [default]
```

Card destructor

4.1.2 Member Function Documentation

4.1.2.1 draw()

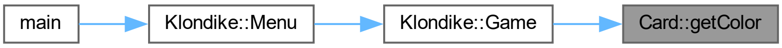
```
void Card::draw (
             RenderTarget & target,
             RenderStates state ) const  [override]
```

Card draw (SFML) method

4.1.2.2 getColor()

```
std::string Card::getColor ( )
```

Getting card color method Here is the caller graph for this function:



4.1.2.3 getHidden()

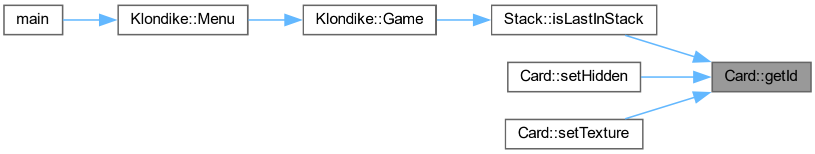
```
bool Card::getHidden ( )
```

Getting card visibility method

4.1.2.4 getId()

```
int Card::getId ( )
```

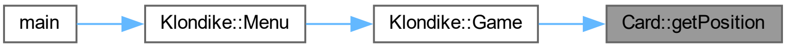
Getting card ID method Here is the caller graph for this function:



4.1.2.5 getPosition()

```
std::pair< float, float > Card::getPosition ( )
```

Getting card position method Here is the caller graph for this function:



4.1.2.6 getShape()

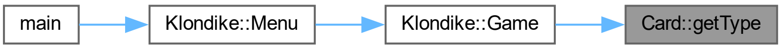
```
RectangleShape Card::getShape ( )
```

Getting card shape method (SFML feature)

4.1.2.7 getType()

```
std::string Card::getType ( )
```

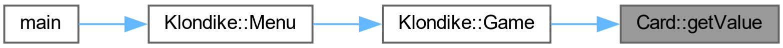
Getting card type method Here is the caller graph for this function:



4.1.2.8 getValue()

```
int Card::getValue ( )
```

Getting card value method Here is the caller graph for this function:



4.1.2.9 setHidden()

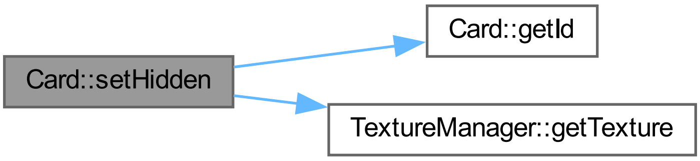
```
void Card::setHidden (
             const bool i )
```

Setting card visibility method.

Parameters

i	Hidden variable

Here is the call graph for this function:



4.1.2.10 setOutline()

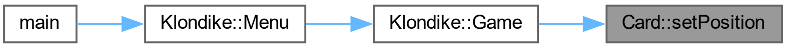
```
void Card::setOutline ( )
```

Setting outline of card shape method

4.1.2.11 setPosition()

```
void Card::setPosition (
             float X,
             float Y )
```

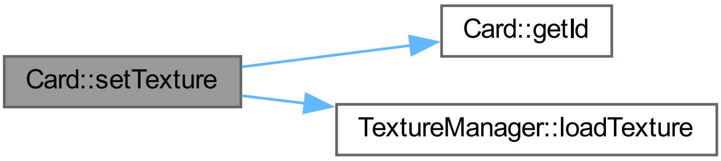
Card possitioning method Here is the caller graph for this function:



4.1.2.12 setTexture()

```
void Card::setTexture ( )
```

Setting texture method Here is the call graph for this function:



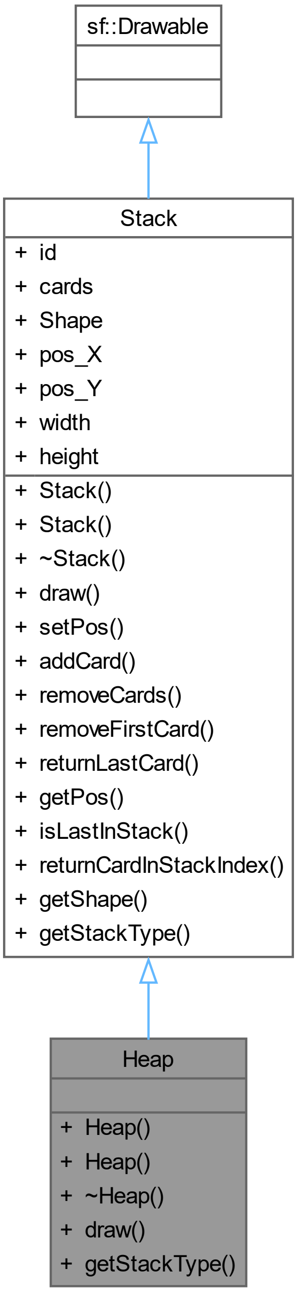
The documentation for this class was generated from the following files:

- Card.h
- Card.cpp

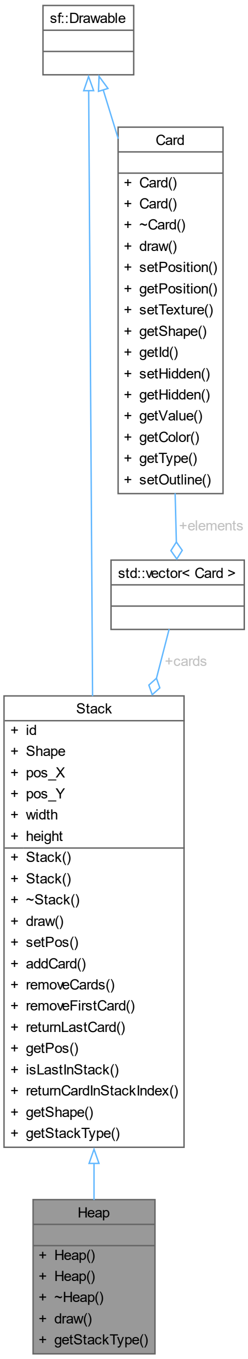
4.2 Heap Class Reference

```
#include <Heap.h>
```

Inheritance diagram for Heap:



Collaboration diagram for Heap:



Public Member Functions

- Heap ()
- Heap (float RectangleX, float RectangleY, std::string stackType)
- ∼Heap ()=default
- void draw (RenderTarget &target, RenderStates state) const override
- std::string getStackType ()

Public Member Functions inherited from Stack

- Stack (const int number, float RectangleX, float RectangleY, std::string stackType)
- Stack ()
- ∼Stack ()=default
- virtual void draw (RenderTarget &target, RenderStates state) const override
- virtual void setPos (float x, float y)
- virtual void addCard (Card card)
- virtual void removeCards (int number)
- virtual void removeFirstCard ()
- virtual Card returnLastCard ()
- std::pair< float, float > getPos ()
- bool isLastInStack (Card &card)
- int returnCardInStackIndex (int card)
- RectangleShape getShape ()
- std::string getStackType ()

Additional Inherited Members

Public Attributes inherited from Stack

- int id
- std::vector< Card > cards
- RectangleShape Shape
- float pos_X
- float pos_Y
- const float width = 60
- const float height = 90

4.2.1 Constructor & Destructor Documentation

4.2.1.1 Heap() [1/2]

```
Heap::Heap ( )
```

Heap basic constructor

4.2.1.2 Heap() [2/2]

```
Heap::Heap (
            float RectangleX,
            float RectangleY,
            std::string stackType )
```

Heap constructor

4.2.1.3 ∼Heap()

```
Heap::∼Heap ( )  [default]
```

Heap destructor

4.2.2 Member Function Documentation

4.2.2.1 draw()

```
void Heap::draw (
            RenderTarget & target,
            RenderStates state ) const  [override], [virtual]
```

Heap drawing method (SFML)

Reimplemented from Stack.

4.2.2.2 getStackType()

```
std::string Heap::getStackType ( )
```

Getting stack type method

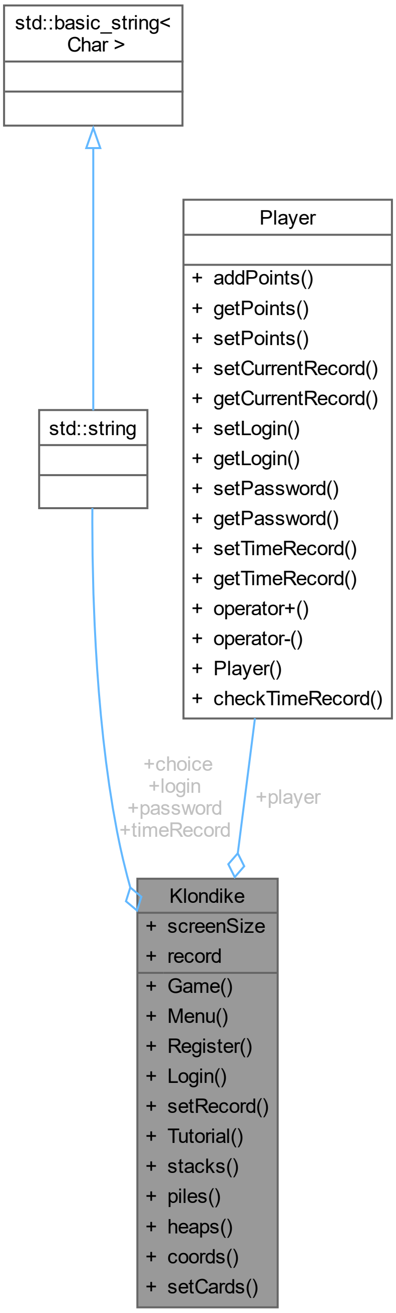
The documentation for this class was generated from the following files:

- Heap.h
- Heap.cpp

4.3 Klondike Class Reference

```
#include <Klondike.h>
```

Collaboration diagram for Klondike:



Static Public Member Functions

- static void Game ()
- static void Menu ()
- static void Register ()
- static bool Login (std::string &loginPlayer, std::string &passwordPlayer, int &record, std::string &timeRecord)
- static void setRecord (Player &player)

- static void Tutorial ()
- static std::vector< Stack > stacks ()
- static std::vector< Pile > piles ()
- static std::vector< Heap > heaps ()
- static std::vector< float > coords ()
- static void setCards (std::vector< Stack > &stacks, std::vector< Pile > &piles, std::vector< Heap > &heaps, std::vector< Card > &cards, std::vector< float > &coords)

Static Public Attributes

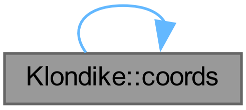
- static std::pair< float, float > screenSize
- static std::string choice
- static Player player
- static std::string login
- static std::string password
- static int record
- static std::string timeRecord

4.3.1 Member Function Documentation

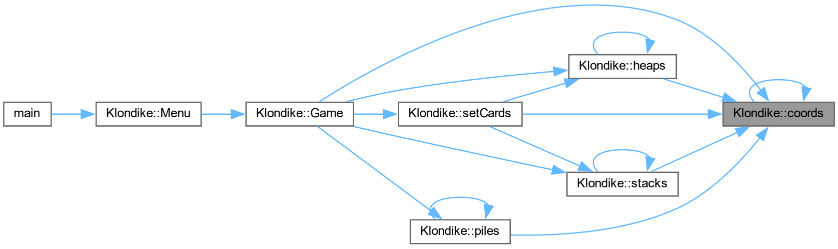
4.3.1.1 coords()

```
std::vector< float > Klondike::coords ( )  [static]
```

Creating differents coords / values being used in program. They are dependent of the screen size. Here is the call graph for this function:



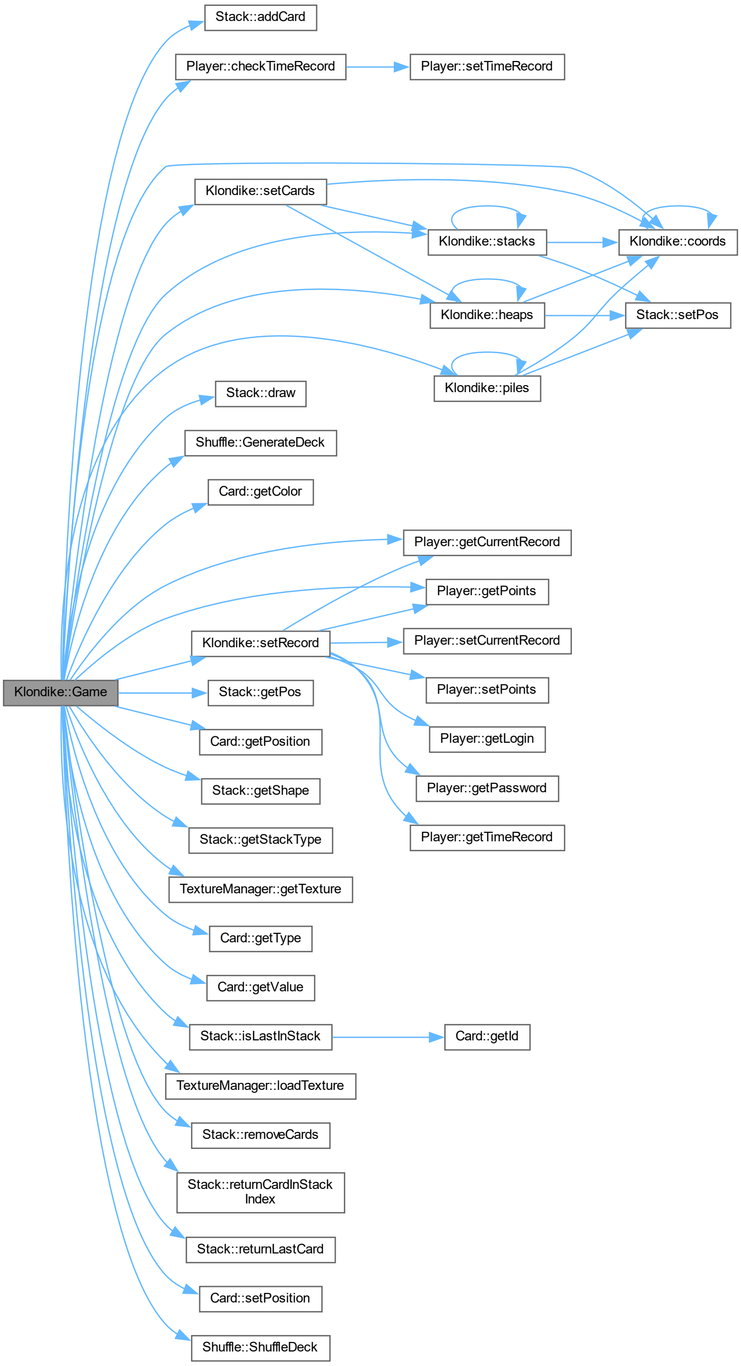
Here is the caller graph for this function:



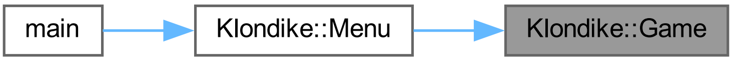
4.3.1.2 Game()

```
void Klondike::Game ( )  [static]
```

Whole Game Method Here is the call graph for this function:



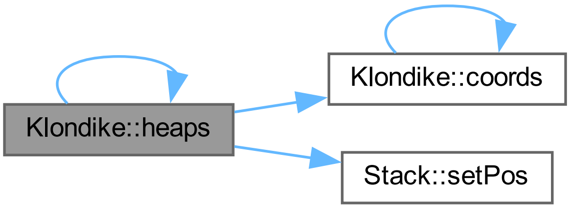
Here is the caller graph for this function:



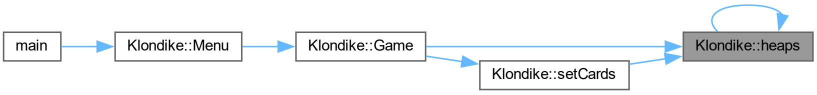
4.3.1.3 heaps()

```
std::vector< Heap > Klondike::heaps ( )  [static]
```

Creating heaps method Here is the call graph for this function:



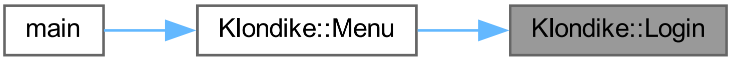
Here is the caller graph for this function:



4.3.1.4 Login()

```
bool Klondike::Login (
            std::string & loginPlayer,
            std::string & passwordPlayer,
            int & record,
            std::string & timeRecord )  [static]
```

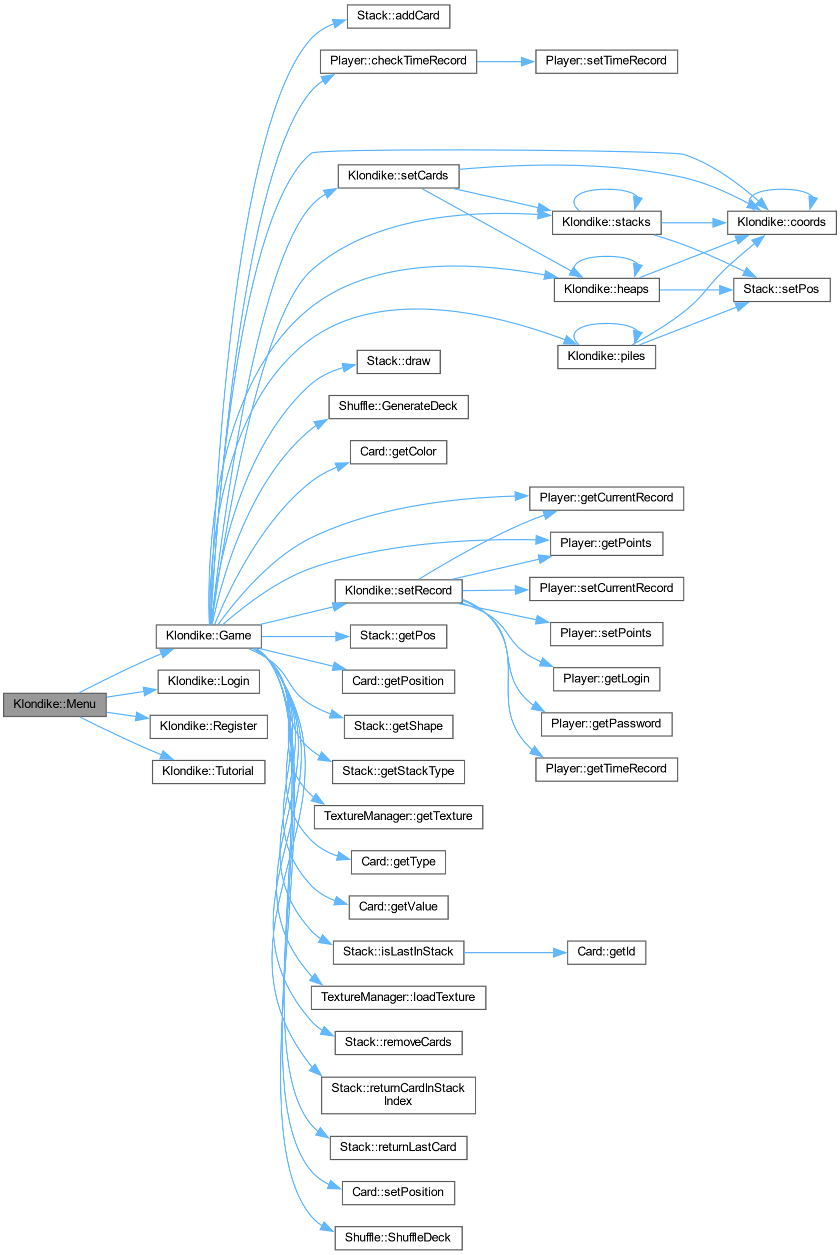
Player logging method Here is the caller graph for this function:



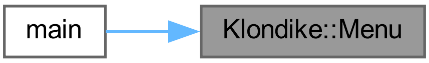
4.3.1.5 Menu()

```
void Klondike::Menu ( )  [static]
```

Displaying menu method Here is the call graph for this function:



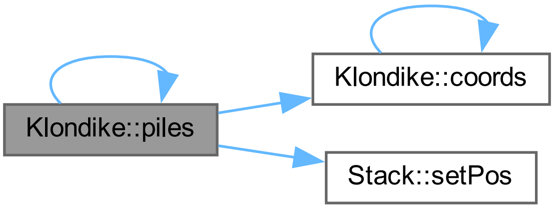
Here is the caller graph for this function:



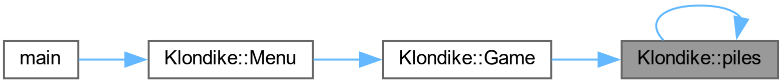
4.3.1.6 piles()

```
std::vector< Pile > Klondike::piles ( )  [static]
```

Creating piles method Here is the call graph for this function:



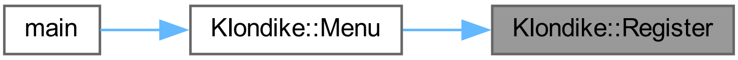
Here is the caller graph for this function:



4.3.1.7 Register()

```
void Klondike::Register ( )  [static]
```

Player registering method Here is the caller graph for this function:



4.3.1.8 setCards()

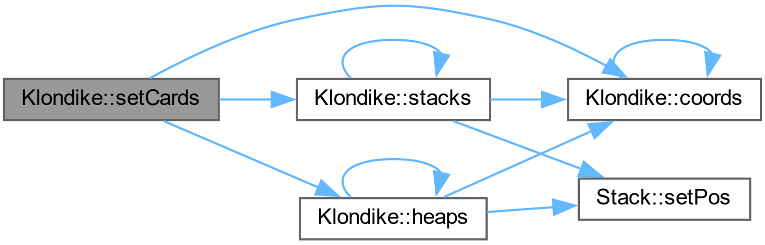
```
void Klondike::setCards (
             std::vector< Stack > & stacks,
             std::vector< Pile > & piles,
             std::vector< Heap > & heaps,
             std::vector< Card > & cards,
             std::vector< float > & coords )  [static]
```

Starting cards positioning method.

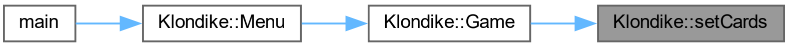
Parameters

stacks	Stacks vector
piles	Piles vector
heaps	Heaps vector
cards	Cards vector
coords	Coords vector

Here is the call graph for this function:



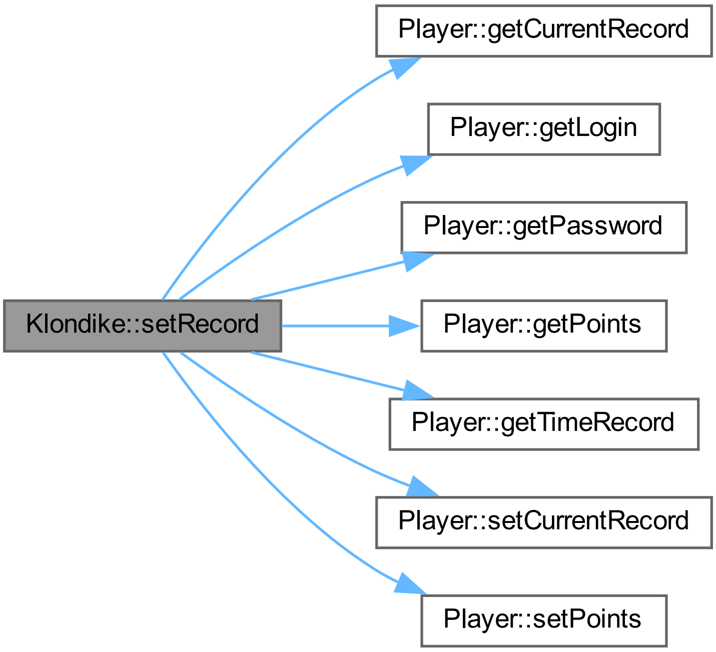
Here is the caller graph for this function:



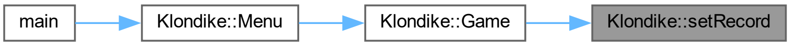
4.3.1.9 setRecord()

```
void Klondike::setRecord (
            Player & player )  [static]
```

Setting new player's record method Here is the call graph for this function:



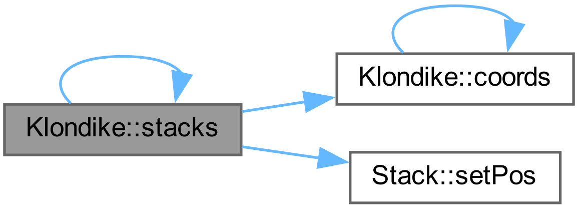
Here is the caller graph for this function:



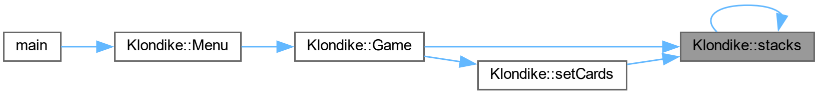
4.3.1.10 stacks()

```
std::vector< Stack > Klondike::stacks ( )  [static]
```

Creating stacks method Here is the call graph for this function:



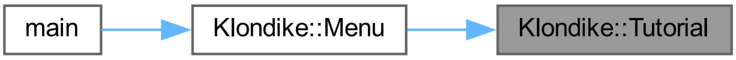
Here is the caller graph for this function:



4.3.1.11 Tutorial()

```
void Klondike::Tutorial ( )  [static]
```

Displaying tutorial method Here is the caller graph for this function:



4.3.2 Member Data Documentation

4.3.2.1 choice

```
std::string Klondike::choice  [static]
```

Menu choice variable

4.3.2.2 login

```
std::string Klondike::login [static]
```

Player login

4.3.2.3 password

```
std::string Klondike::password [static]
```

Player password

4.3.2.4 player

```
Player Klondike::player [static]
```

Logged player object

4.3.2.5 record

```
int Klondike::record [static]
```

Player saved record

4.3.2.6 screenSize

```
std::pair< float, float > Klondike::screenSize [static]
```

Static variable - X and Y of screen

4.3.2.7 timeRecord

```
std::string Klondike::timeRecord [static]
```

Record time of won game by the player

The documentation for this class was generated from the following files:

- Klondike.h
- Klondike.cpp

4.4 myEvent Class Reference

```
#include <myEvent.h>
```

Collaboration diagram for myEvent:

Public Member Functions

- myEvent ()
- myEvent (int type, int movedCardsAmount, Stack ∗grabbedStackPtr, Card &destinationCard, Stack ∗destinationStackPtr)
- myEvent (int type, int movedCardsAmount, Stack ∗grabbedStackPtr, Stack ∗destinationStackPtr)
- myEvent (int type, int movedCardsAmount)
- int getType ()
- int getMovedCardsAmount ()
- Stack ∗ getGrabbedStackPtr ()
- Card getDestinationCard ()
- Stack ∗ getDestinationStackPtr ()
- bool getChangedTexture ()
- void setChangedTexture (bool x)

4.4.1 Constructor & Destructor Documentation

4.4.1.1 myEvent() [1/4]

```
myEvent::myEvent ( )
```

Event basic constructor

4.4.1.2 myEvent() [2/4]

```
myEvent::myEvent (
              int type,
              int movedCardsAmount,
              Stack * grabbedStackPtr,
              Card & destinationCard,
              Stack * destinationStackPtr )
```

Event constructor.

Parameters

type	Amount of cards that are being moved from stack to stack
movedCardsAmount	Grabbed stack pointer (stack from which card/s were moved)
grabbedStackPtr	Grabbed stack pointer (stack from which card/s were moved)
destinationCard	Destination card place (by reference)
destinationStackPtr	Destination stack pointer

4.4.1.3 myEvent() [3/4]

```
myEvent::myEvent (
              int type,
              int movedCardsAmount,
              Stack * grabbedStackPtr,
              Stack * destinationStackPtr )
```

Event constructor.

Parameters

type	Amount of cards that are being moved from stack to stack
movedCardsAmount	Grabbed stack pointer (stack from which card/s were moved)
grabbedStackPtr	Grabbed stack pointer (stack from which card/s were moved)
destinationStackPtr	Destination stack pointer

4.4.1.4 myEvent() [4/4]

```
myEvent::myEvent (
              int type,
              int movedCardsAmount )
```

Event constructor.

Parameters

type	Amount of cards that are being moved from stack to stack
movedCardsAmount	Grabbed stack pointer (stack from which card/s were moved)

4.4.2 Member Function Documentation

4.4.2.1 getChangedTexture()

```
bool myEvent::getChangedTexture ( )
```

Getting changedTexture variable

4.4.2.2 getDestinationCard()

```
Card myEvent::getDestinationCard ( )
```

Getting destination card method

4.4.2.3 getDestinationStackPtr()

```
Stack * myEvent::getDestinationStackPtr ( )
```

Getting pointer to destination stack method

4.4.2.4 getGrabbedStackPtr()

```
Stack * myEvent::getGrabbedStackPtr ( )
```

Getting pointer to grabbed stack method

4.4.2.5 getMovedCardsAmount()

```
int myEvent::getMovedCardsAmount ( )
```

Getting amount of moved cards method

4.4.2.6 getType()

```
int myEvent::getType ( )
```

Getting event type method

4.4.2.7 setChangedTexture()

```
void myEvent::setChangedTexture (
             bool x )
```

Setting changedTexture variable.

Parameters

x	ChangedTexture variable

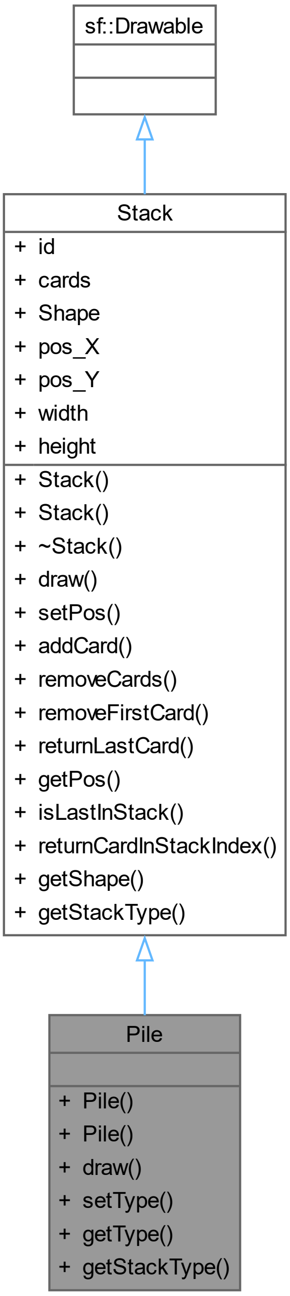
The documentation for this class was generated from the following files:

- myEvent.h
- myEvent.cpp

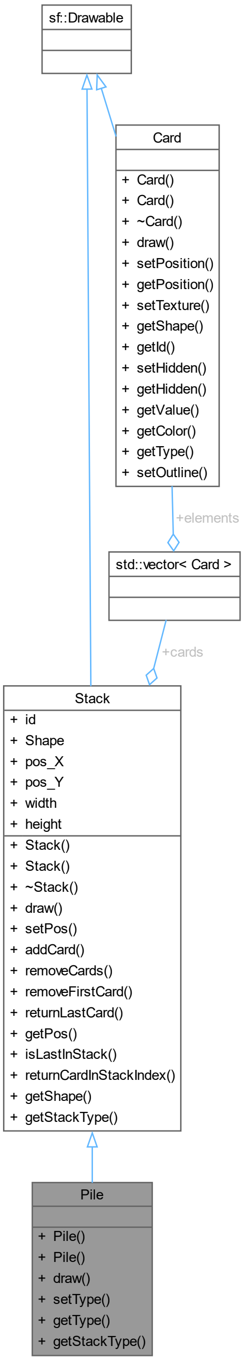
4.5 Pile Class Reference

```
#include <Pile.h>
```

Inheritance diagram for Pile:



Collaboration diagram for Pile:



Public Member Functions

- Pile ()
- Pile (float RectangleX, float RectangleY, std::string stackType)
- void draw (RenderTarget &target, RenderStates state) const override
- void setType (std::string x)
- std::string getType ()
- std::string getStackType ()

Public Member Functions inherited from Stack

- Stack (const int number, float RectangleX, float RectangleY, std::string stackType)
- Stack ()
- ∼Stack ()=default
- virtual void draw (RenderTarget &target, RenderStates state) const override
- virtual void setPos (float x, float y)
- virtual void addCard (Card card)
- virtual void removeCards (int number)
- virtual void removeFirstCard ()
- virtual Card returnLastCard ()
- std::pair< float, float > getPos ()
- bool isLastInStack (Card &card)
- int returnCardInStackIndex (int card)
- RectangleShape getShape ()
- std::string getStackType ()

Additional Inherited Members

Public Attributes inherited from Stack

- int id
- std::vector< Card > cards
- RectangleShape Shape
- float pos_X
- float pos_Y
- const float width = 60
- const float height = 90

4.5.1 Constructor & Destructor Documentation

4.5.1.1 Pile() [1/2]

```
Pile::Pile ( )
```

Pile basic constructor

4.5.1.2 Pile() [2/2]

```
Pile::Pile (
             float RectangleX,
             float RectangleY,
             std::string stackType )
```

Pile construcor.

Parameters

RectangleX	Pile position (x)
RectangleY	Pile position (y)
stackType	Stack type

4.5.2 Member Function Documentation

4.5.2.1 draw()

```
void Pile::draw (
             RenderTarget & target,
             RenderStates state ) const  [override], [virtual]
```

Pile drawing method (SFML)

Reimplemented from Stack.

4.5.2.2 getStackType()

```
std::string Pile::getStackType ( )
```

Getting stack type method

4.5.2.3 getType()

```
std::string Pile::getType ( )
```

Getting pile type method

4.5.2.4 setType()

```
void Pile::setType (
             std::string x )
```

Setting pile type method.

Parameters

x	Type that we're setting

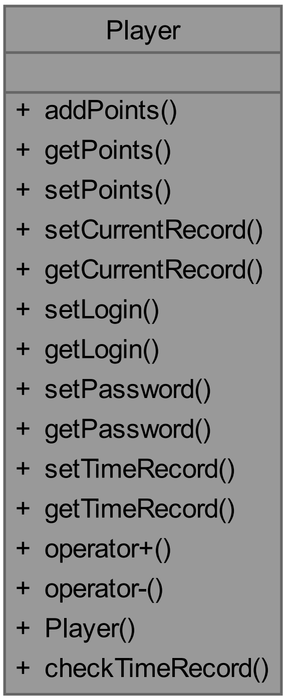
The documentation for this class was generated from the following files:

- Pile.h
- Pile.cpp

4.6 Player Class Reference

```
#include <Player.h>
```

Collaboration diagram for Player:



Public Member Functions

- void addPoints (int points)
- int getPoints ()
- void setPoints (int points)
- void setCurrentRecord (int record)
- int getCurrentRecord ()
- void setLogin (std::string login)
- std::string getLogin ()
- void setPassword (std::string password)
- std::string getPassword ()
- void setTimeRecord (std::string timeRecord)
- std::string getTimeRecord ()
- Player operator+ (int points)
- Player operator- (int points)
- Player (std::string login, std::string password, int record, std::string timeRecord)
- void checkTimeRecord (Text &time, int hours, int minutes, int seconds)

4.6.1 Constructor & Destructor Documentation

4.6.1.1 Player()

```
Player::Player (
            std::string login,
            std::string password,
            int record,
            std::string timeRecord )
```

Player constructor.

Parameters

login	Login
password	Password
record	Record
timeRecord	Time record

4.6.2 Member Function Documentation

4.6.2.1 addPoints()

```
void Player::addPoints (
             int points )
```

Adding points method.

Parameters

points	Points value

4.6.2.2 checkTimeRecord()

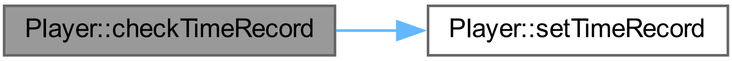
```
void Player::checkTimeRecord (
             Text & time,
             int hours,
             int minutes,
             int seconds )
```

Method that checks if player set new time record.

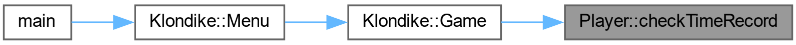
Parameters

time	Previous saved time record text
hours	Current time hours
minutes	Current time minutes
seconds	Current time seconds

Here is the call graph for this function:



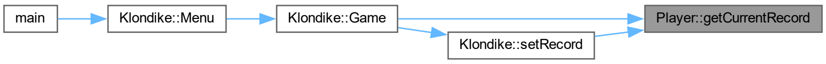
Here is the caller graph for this function:



4.6.2.3 getCurrentRecord()

```
int Player::getCurrentRecord ( )
```

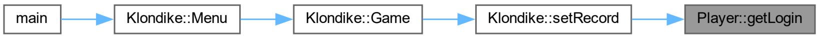
Getting current record value Here is the caller graph for this function:



4.6.2.4 getLogin()

```
std::string Player::getLogin ( )
```

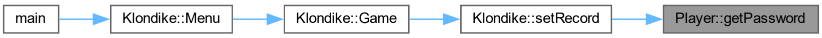
Getting login method Here is the caller graph for this function:



4.6.2.5 getPassword()

```
std::string Player::getPassword ( )
```

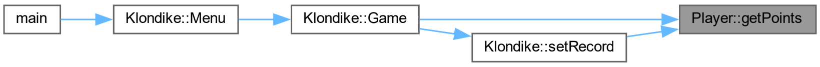
Getting password method Here is the caller graph for this function:



4.6.2.6 getPoints()

```
int Player::getPoints ( )
```

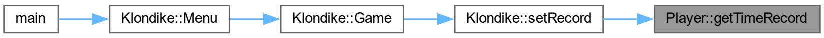
Getting points method Here is the caller graph for this function:



4.6.2.7 getTimeRecord()

```
std::string Player::getTimeRecord ( )
```

Getting time record method Here is the caller graph for this function:



4.6.2.8 operator+()

```
Player Player::operator+ (
                int points )
```

Operator made in order to add player points in a different way.

Parameters

points	value

4.6.2.9 operator-()

```
Player Player::operator- (
             int points )
```

Operator made in order to subtract player points in a different way.

Parameters

points	value

4.6.2.10 setCurrentRecord()

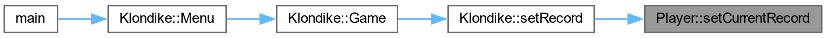
```
void Player::setCurrentRecord (
             int record )
```

Setting current record method.

Parameters

record	Record (points) value

Here is the caller graph for this function:



4.6.2.11 setLogin()

```
void Player::setLogin (
             std::string login )
```

Setting login method.

Parameters

login	Login

4.6.2.12 setPassword()

```
void Player::setPassword (
             std::string password )
```

Setting password method.

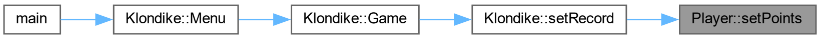
Parameters

password	Password

4.6.2.13 setPoints()

```
void Player::setPoints (
             int points )
```

Setting a fixed value of points method Here is the caller graph for this function:



4.6.2.14 setTimeRecord()

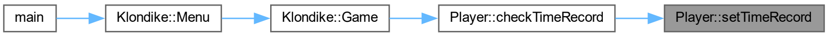
```
void Player::setTimeRecord (
             std::string timeRecord )
```

Setting time record method.

Parameters

timeRecord	Time record (xx::yy::zz)

Here is the caller graph for this function:



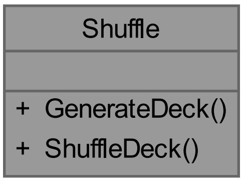
The documentation for this class was generated from the following files:

- Player.h
- Player.cpp

4.7 Shuffle Class Reference

```
#include <Shuffle.h>
```

Collaboration diagram for Shuffle:



Static Public Member Functions

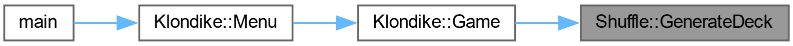
- static std::vector< Card > GenerateDeck ()
- static std::vector< Card > ShuffleDeck (std::vector< Card > Deck)

4.7.1 Member Function Documentation

4.7.1.1 GenerateDeck()

```
std::vector< Card > Shuffle::GenerateDeck ( )  [static]
```

Generating deck method Here is the caller graph for this function:



4.7.1.2 ShuffleDeck()

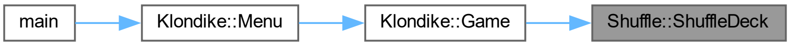
```
std::vector< Card > Shuffle::ShuffleDeck (
            std::vector< Card > Deck )  [static]
```

Shuffling deck method.

Parameters

Deck	Deck we want to shuffle

Here is the caller graph for this function:



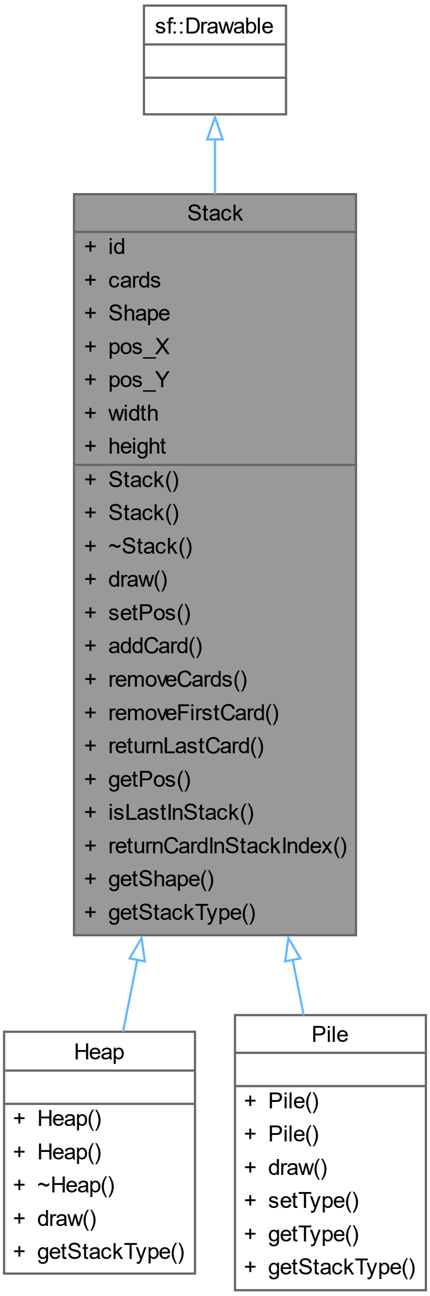
The documentation for this class was generated from the following files:

- Shuffle.h
- Shuffle.cpp

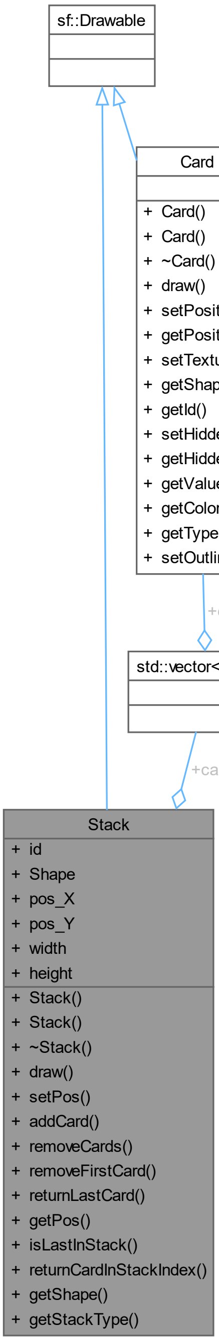
4.8 Stack Class Reference

```
#include <Stack.h>
```

Inheritance diagram for Stack:



Collaboration diagram for Stack:



Public Member Functions

- Stack (const int number, float RectangleX, float RectangleY, std::string stackType)
- Stack ()
- ∼Stack ()=default
- virtual void draw (RenderTarget &target, RenderStates state) const override
- virtual void setPos (float x, float y)

- virtual void addCard (Card card)
- virtual void removeCards (int number)
- virtual void removeFirstCard ()
- virtual Card returnLastCard ()
- std::pair< float, float > getPos ()
- bool isLastInStack (Card &card)
- int returnCardInStackIndex (int card)
- RectangleShape getShape ()
- std::string getStackType ()

Public Attributes

- int id
- std::vector< Card > cards
- RectangleShape Shape
- float pos_X
- float pos_Y
- const float width = 60
- const float height = 90

4.8.1 Constructor & Destructor Documentation

4.8.1.1 Stack() [1/2]

```
Stack::Stack (
            const int number,
            float RectangleX,
            float RectangleY,
            std::string stackType )
```

Stack constructor.

Parameters

number	Stack ID
RectangleX	Stack position (x)
RectangleY	Stack position (y)
stackType	Stack type

4.8.1.2 Stack() [2/2]

```
Stack::Stack ( )
```

Stack basic constructor

4.8.1.3 ∼Stack()

```
Stack::∼Stack ( )  [default]
```

Stack destructor

4.8.2 Member Function Documentation

4.8.2.1 addCard()

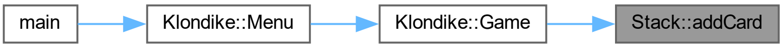
```
void Stack::addCard (
             Card card )  [virtual]
```

Adding card to stack's vector method.

Parameters

card	Card

Here is the caller graph for this function:



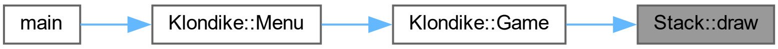
4.8.2.2 draw()

```
void Stack::draw (
             RenderTarget & target,
             RenderStates state ) const  [override], [virtual]
```

Virtual drawing method (SFML)

Reimplemented in Heap, and Pile.

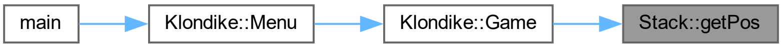
Here is the caller graph for this function:



4.8.2.3 getPos()

```
std::pair< float, float > Stack::getPos ( )
```

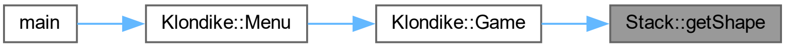
Getting position of stack (x,y) Here is the caller graph for this function:



4.8.2.4 getShape()

```
RectangleShape Stack::getShape ( )
```

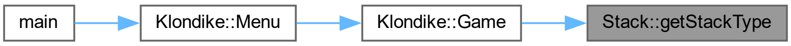
Getting stack's shape method (SFML) Here is the caller graph for this function:



4.8.2.5 getStackType()

```
std::string Stack::getStackType ( )
```

Getting stack type method Here is the caller graph for this function:



4.8.2.6 isLastInStack()

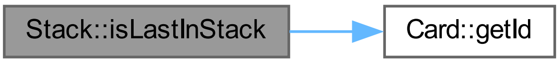
```
bool Stack::isLastInStack (
             Card & card )
```

Method that defines if card is last in stack's vector

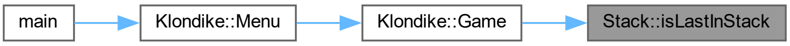
Parameters

card	Card

Here is the call graph for this function:



Here is the caller graph for this function:



4.8.2.7 removeCards()

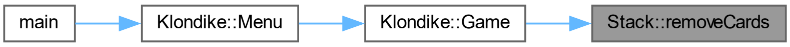
```
void Stack::removeCards (
             int number )  [virtual]
```

Removing x cards from the back of stack's vector method.

Parameters

number	Number of cards we want to remove

Here is the caller graph for this function:



4.8.2.8 removeFirstCard()

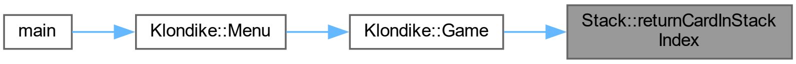
```
void Stack::removeFirstCard ( )  [virtual]
```

Removing first cards from vector method

4.8.2.9 returnCardInStackIndex()

```
int Stack::returnCardInStackIndex (
             int card )
```

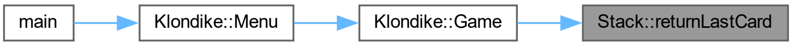
Method that returnes index of last card in stack's vector Here is the caller graph for this function:



4.8.2.10 returnLastCard()

```
Card Stack::returnLastCard ( )  [virtual]
```

Method returning last card in stack's vector Here is the caller graph for this function:



4.8.2.11 setPos()

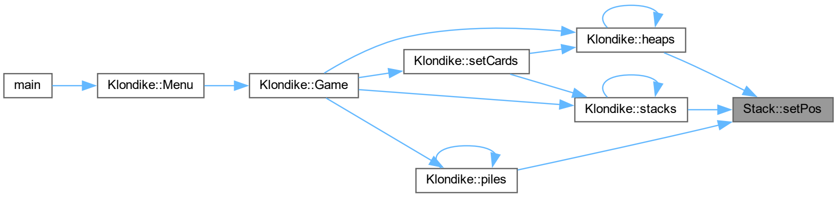
```
void Stack::setPos (
            float x,
            float y )  [virtual]
```

Virtual setting position method.

Parameters

x	X
y	Y

Here is the caller graph for this function:



4.8.3 Member Data Documentation

4.8.3.1 cards

```
std::vector<Card> Stack::cards
```

Vector of cards assigned to that stack

4.8.3.2 height

```
const float Stack::height = 90
```

Stack height (y)

4.8.3.3 id

```
int Stack::id
```

Stack ID

4.8.3.4 pos_X

```
float Stack::pos_X
```

Stack position (x)

4.8.3.5 pos_Y

```
float Stack::pos_Y
```

Stack position (y)

4.8.3.6 Shape

```
RectangleShape Stack::Shape
```

Shape of the stack (SFML)

4.8.3.7 width

```
const float Stack::width = 60
```

Stack width (x)

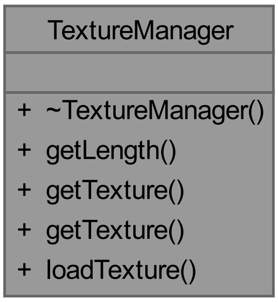
The documentation for this class was generated from the following files:

- Stack.h
- Stack.cpp

4.9 TextureManager Class Reference

```
#include <TextureManager.h>
```

Collaboration diagram for TextureManager:



Public Member Functions

- ∼TextureManager ()

Static Public Member Functions

- static int getLength ()
- static sf::Texture ∗ getTexture (string name)
- static sf::Texture ∗ getTexture (int index)
- static sf::Texture ∗ loadTexture (string name, string path)

4.9.1 Constructor & Destructor Documentation

4.9.1.1 ∼TextureManager()

```
TextureManager::∼TextureManager ( )
```

Destructor which deletes the textures previously loaded

4.9.2 Member Function Documentation

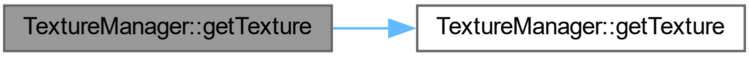
4.9.2.1 getLength()

```
int TextureManager::getLength ( )  [static]
```

4.9.2.2 getTexture() [1/2]

```
sf::Texture ∗ TextureManager::getTexture (
             int index )  [static]
```

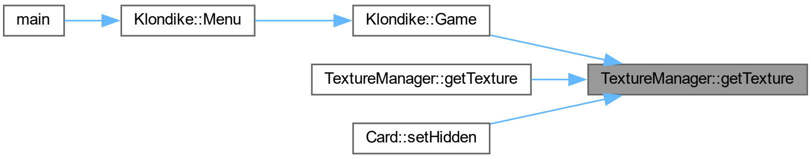
Get texutre by index in map, or return null Here is the call graph for this function:



4.9.2.3 getTexture() [2/2]

```
sf::Texture * TextureManager::getTexture (
             string name )  [static]
```

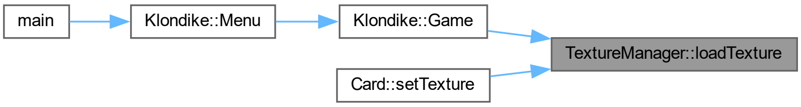
Get texutre by name specified in loadTexture, or return null Here is the caller graph for this function:



4.9.2.4 loadTexture()

```
sf::Texture * TextureManager::loadTexture (
             string name,
             string path )  [static]
```

Loads the texture and returns a pointer to it. If it is already loaded, this function just returns it. If it cannot find the file, returns NULL Here is the caller graph for this function:



The documentation for this class was generated from the following files:

- TextureManager.h
- TextureManager.cpp

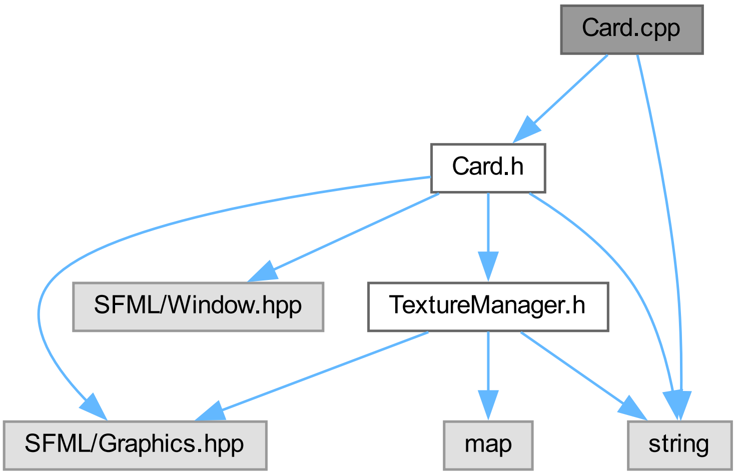
Chapter 5

File Documentation

5.1 Card.cpp File Reference

```
#include ¨Card.h¨
#include <string>
```

Include dependency graph for Card.cpp:



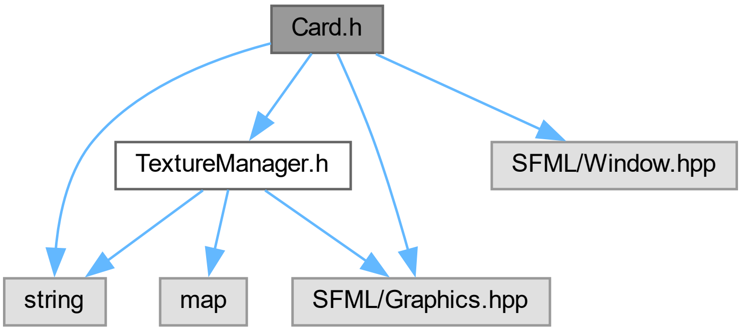
5.2 Card.h File Reference

Card class.

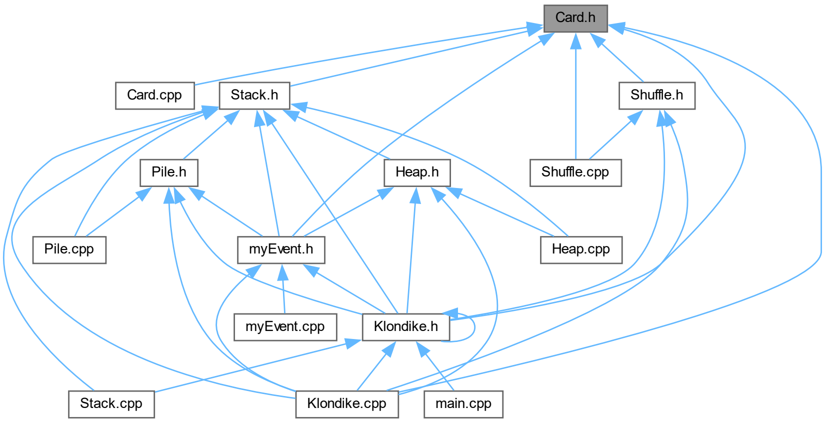
```
#include <string>
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
```

```
#include ¨TextureManager.h¨
```

Include dependency graph for Card.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Card

5.2.1 Detailed Description

Card class.

Author

Karol Ziaja

Date

August 2023

5.3 Card.h

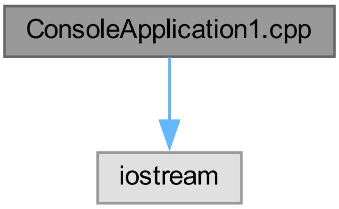
Go to the documentation of this file.

```
/*****************************************************************/
#pragma once

#include <string>
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
#include "TextureManager.h"

using namespace sf;

class Card : public sf::Drawable {
    int index;
    int Value;
    std::string Color;
    std::string Type;
    std::string texturePath;
    RectangleShape cardShape;
    float width = 65;
    float height = 90;
    bool hidden;
    float currentPositionX;
    float currentPositionY;
public:
    Card();
    Card(int index, int value, std::string Color, std::string Type, std::string texturePath);
    ~Card() = default;
    void draw(RenderTarget& target, RenderStates state) const override;
    void setPosition(float X, float Y);
    std::pair<float, float> getPosition();
    void setTexture();
    RectangleShape getShape();
    int getId();
    void setHidden(const bool i);
    bool getHidden();
    int getValue();
    std::string getColor();
    std::string getType();
    void setOutline();
};

//1-A
//2-2
//3-3
//4-4
//5-5
//6-6
//7-7
//8-8
//9-9
//10-10
//11-J
//12-Q
//13-K

```

5.4 ConsoleApplication1.cpp File Reference

```
#include <iostream>
```

Include dependency graph for ConsoleApplication1.cpp:



Functions

- int main ()

5.4.1 Function Documentation

5.4.1.1 main()

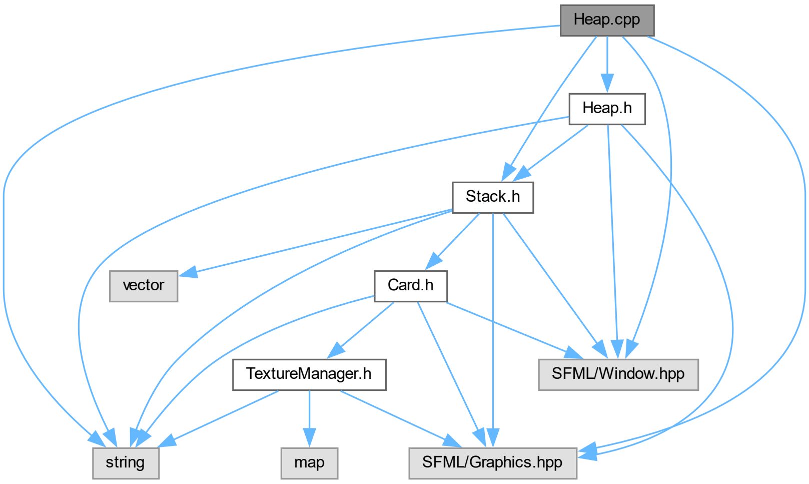
```
int main ( )
```

5.5 Heap.cpp File Reference

```
#include ¨Stack.h¨
#include ¨Heap.h¨
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
```

```
#include <string>
```

Include dependency graph for Heap.cpp:

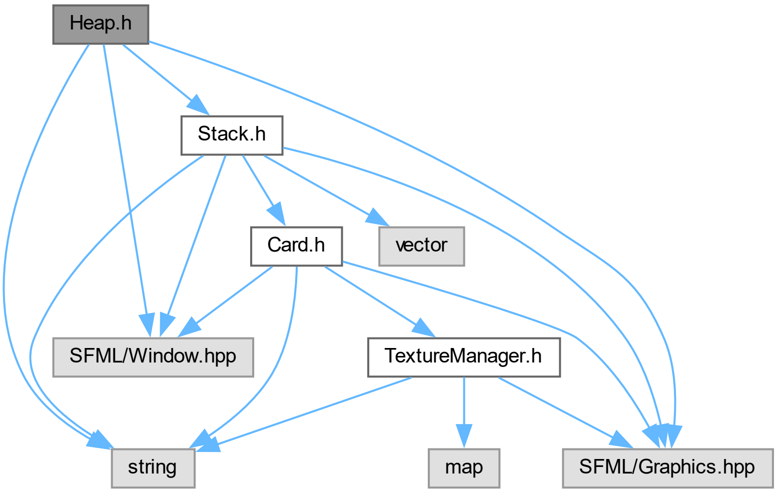


5.6 Heap.h File Reference

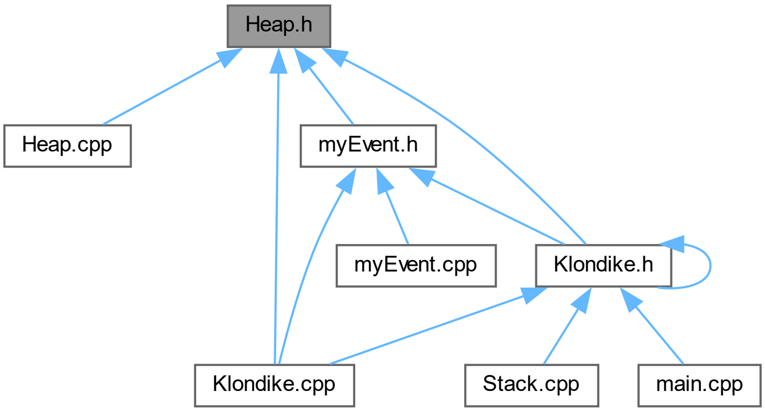
Heap of cards in top left corner (class)

```
#include <string>
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
#include ¨Stack.h¨
```

Include dependency graph for Heap.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Heap

5.6.1 Detailed Description

Heap of cards in top left corner (class)

Author

Karol Ziaja

Date

August 2023

5.7 Heap.h

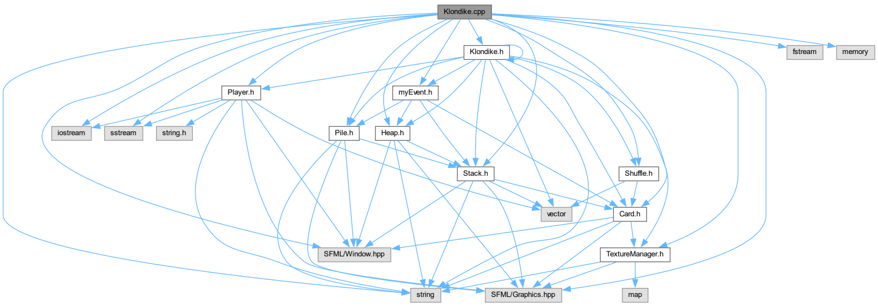
Go to the documentation of this file.

```
/***********************************************************************/
#pragma once

#include <string>
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
#include "Stack.h"
using namespace sf;

class Heap : public Stack {
    std::string stackType;
public:
    Heap();
    Heap(float RectangleX, float RectangleY, std::string stackType);
    ~Heap() = default;
    void draw(RenderTarget& target, RenderStates state) const override;
    std::string getStackType();
};
```

5.8 Klondike.cpp File Reference

```
#include <iostream>
#include <sstream>
#include <string>
#include <fstream>
#include ¨Klondike.h¨
#include ¨Stack.h¨
#include ¨Pile.h¨
#include ¨Heap.h¨
#include ¨Shuffle.h¨
#include ¨myEvent.h¨
#include ¨TextureManager.h¨
#include ¨Card.h¨
#include ¨Player.h¨
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
#include <memory>
```

Include dependency graph for Klondike.cpp:

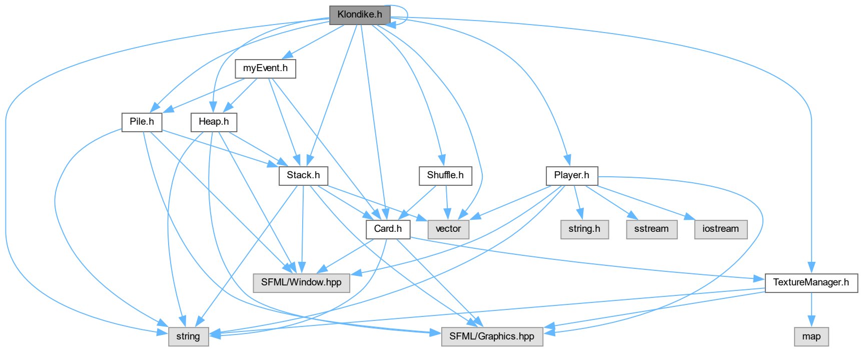


5.9 Klondike.h File Reference

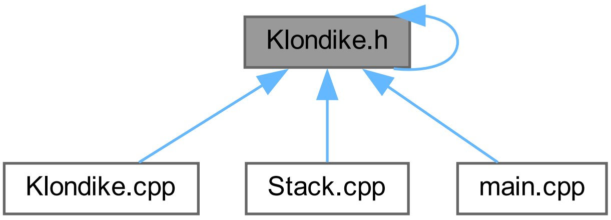
Main Game Class.

```
#include <vector>
#include <string>
#include ¨Klondike.h¨
#include ¨Stack.h¨
#include ¨Pile.h¨
#include ¨Heap.h¨
#include ¨Shuffle.h¨
#include ¨myEvent.h¨
#include ¨TextureManager.h¨
#include ¨Card.h¨
#include ¨Player.h¨
```

Include dependency graph for Klondike.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Klondike

5.9.1 Detailed Description

Main Game Class.

Author

Karol Ziaja

Date

August 2023

5.10 Klondike.h

Go to the documentation of this file.

```
/*****************************************************************/
#pragma once

#include <vector>
#include <string>
#include "Klondike.h"
#include "Stack.h"
#include "Pile.h"
#include "Heap.h"
#include "Shuffle.h"
#include "myEvent.h"
#include "TextureManager.h"
#include "Card.h"
#include "Player.h"

class Klondike {
public:
    static std::pair<float, float> screenSize;
    static std::string choice;
    static Player player;
    static std::string login;
    static std::string password;
    static int record;
    static std::string timeRecord;
    static void Game();
    static void Menu();
    static void Register();
    static bool Login(std::string& loginPlayer, std::string& passwordPlayer, int& record, std::string& timeRecord);
    static void setRecord(Player& player);
    static void Tutorial();
    static std::vector<Stack> stacks();
    static std::vector<Pile> piles();
    static std::vector<Heap> heaps();
    static std::vector<float> coords();
    static void setCards(std::vector<Stack> &stacks, std::vector<Pile> &piles, std::vector<Heap> &heaps, std::vector<Card> &cards, std::vector<float>& coords);
};
```

5.11 Lib.h File Reference

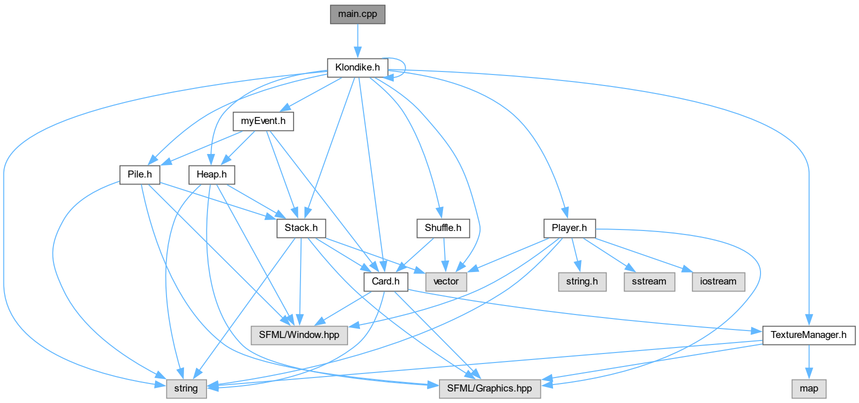
5.12 Lib.h

Go to the documentation of this file.

5.13 main.cpp File Reference

`#include ¨Klondike.h¨`

Include dependency graph for main.cpp:



Functions

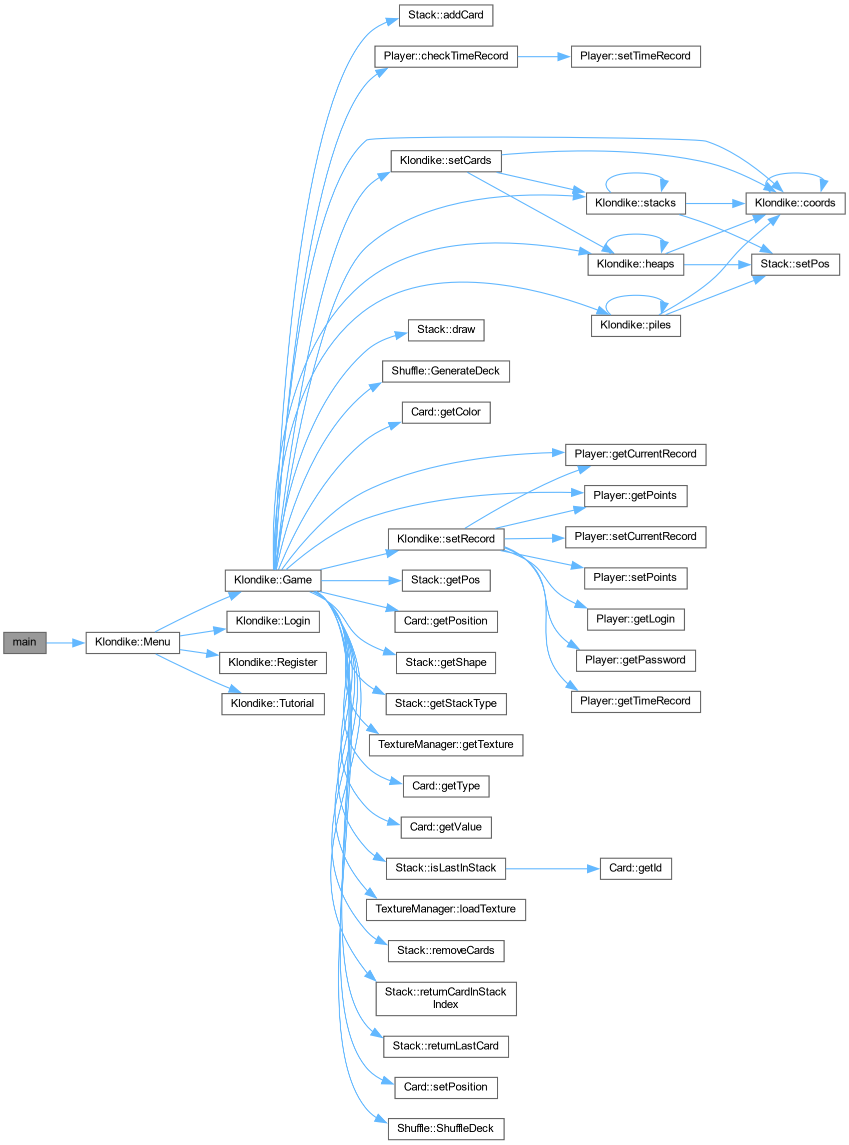
- int main ()

5.13.1 Function Documentation

5.13.1.1 main()

```
int main ( )
```

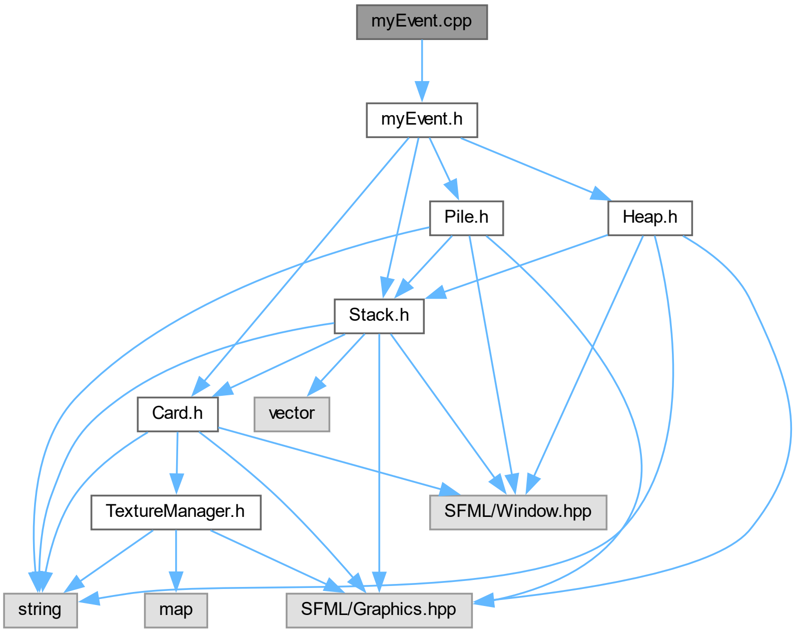
Here is the call graph for this function:



5.14 myEvent.cpp File Reference

```
#include ¨myEvent.h¨
```

Include dependency graph for myEvent.cpp:

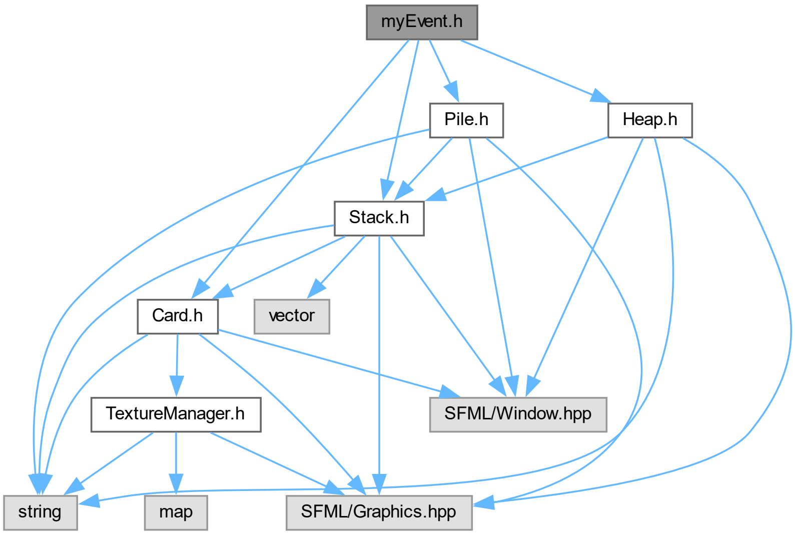


5.15 myEvent.h File Reference

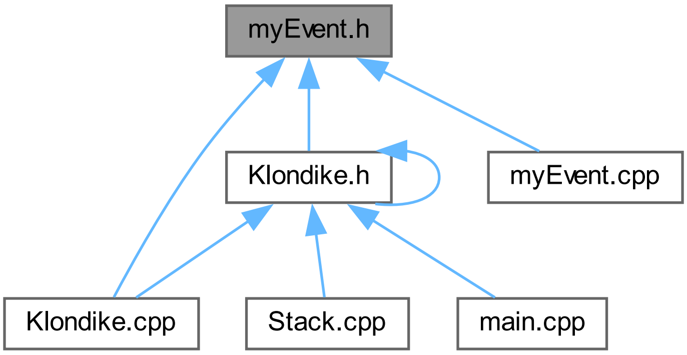
Class made to enable undoing movements. Named myEvent because Event already exists as a part of SFML library.

```
#include ¨Card.h¨
#include ¨Stack.h¨
#include ¨Pile.h¨
#include ¨Heap.h¨
```

Include dependency graph for myEvent.h:



This graph shows which files directly or indirectly include this file:



Classes

- class myEvent

5.15.1 Detailed Description

Class made to enable undoing movements. Named myEvent because Event already exists as a part of SFML library.

Author

Karol Ziaja

Date

August 2023

5.16 myEvent.h

Go to the documentation of this file.

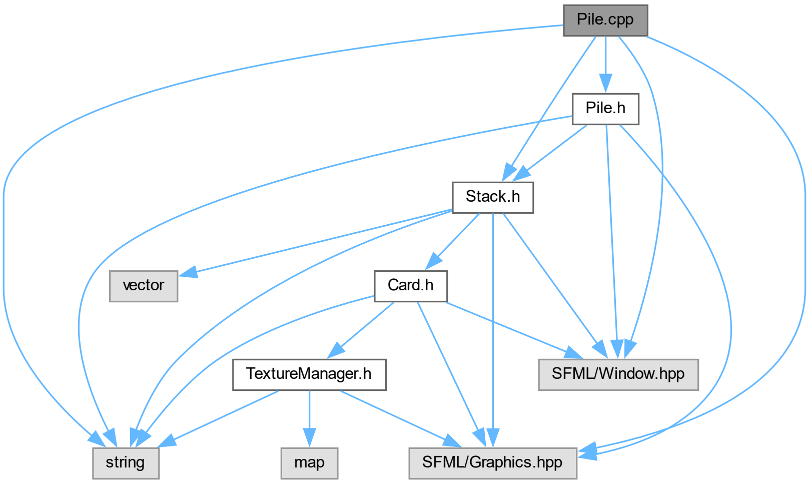
```
/*****************************************************************/
#pragma once

#include "Card.h"
#include "Stack.h"
#include "Pile.h"
#include "Heap.h"

class myEvent {
    int type;
    int movedCardsAmount;
    Stack* grabbedStackPtr;
    Card destinationCard;
    Stack* destinationStackPtr;
    bool changedTexture;
public:
    myEvent();
    myEvent(int type, int movedCardsAmount, Stack* grabbedStackPtr, Card& destinationCard, Stack* destinationStackPtr);
    myEvent(int type, int movedCardsAmount, Stack* grabbedStackPtr, Stack* destinationStackPtr);
    myEvent(int type, int movedCardsAmount);
    int getType();
    int getMovedCardsAmount();
    Stack* getGrabbedStackPtr();
    Card getDestinationCard();
    Stack* getDestinationStackPtr();
    bool getChangedTexture();
    void setChangedTexture(bool x);
};


//Types
//1-Card To Stack
//2-Cards to Stack
//3-King to Stack
//4-King and more cards from Stack to Stack
//5-Ace to Pile
//6-Cards to Pile
//7-empty heap1
//8-card to heap2
```

5.17 Pile.cpp File Reference

```
#include ¨Pile.h¨
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
#include ¨Stack.h¨
```

```
#include <string>
```

Include dependency graph for Pile.cpp:

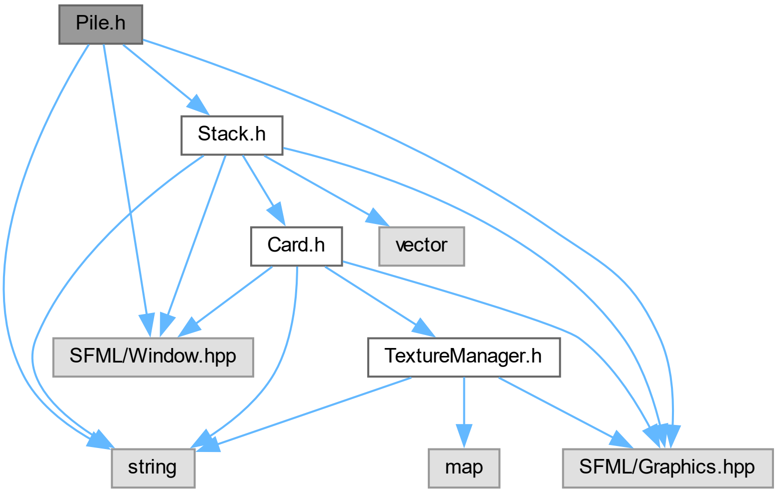


5.18 Pile.h File Reference

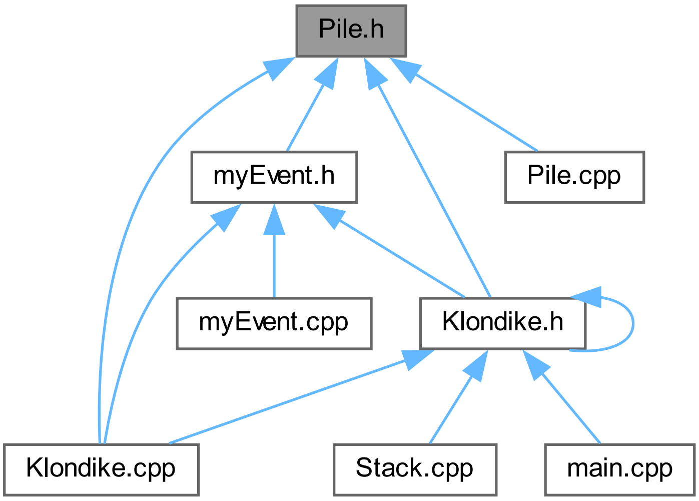
Four (collecting) piles of cards at the top (class)

```
#include ¨Stack.h¨
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
#include <string>
```

Include dependency graph for Pile.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Pile

5.18.1 Detailed Description

Four (collecting) piles of cards at the top (class)

Author

Karol Ziaja

Date

August 2023

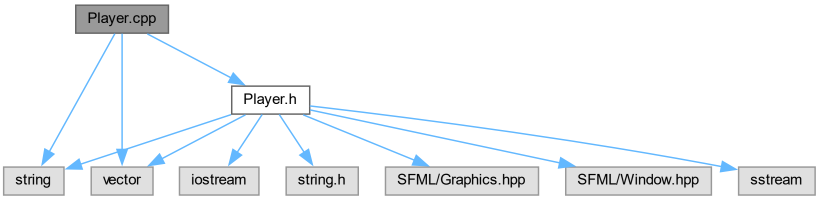
5.19 Pile.h

Go to the documentation of this file.

```
/**********************************************************************/
#pragma once

#include "Stack.h"
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
#include <string>
using namespace sf;

class Pile : public Stack {
    std::string Type;
    std::string stackType;
public:
    Pile();
    Pile(float RectangleX, float RectangleY, std::string stackType);
    void draw(RenderTarget& target, RenderStates state) const override;
    void setType(std::string x);
    std::string getType();
    std::string getStackType();
};
```

5.20 Player.cpp File Reference

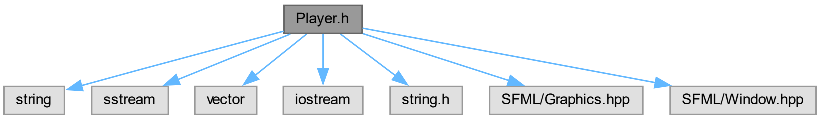
`#include ¨Player.h¨`
`#include <string>`
`#include <vector>`
Include dependency graph for Player.cpp:



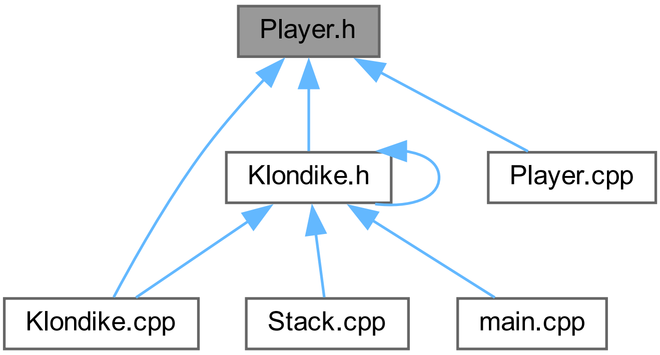
5.21 Player.h File Reference

Current player data class.

`#include <string>`
`#include <sstream>`
`#include <vector>`
`#include <iostream>`
`#include <string.h>`
`#include <SFML/Graphics.hpp>`
`#include <SFML/Window.hpp>`
Include dependency graph for Player.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Player

5.21.1 Detailed Description

Current player data class.

Author

Karol Ziaja

Date

August 2023

5.22 Player.h

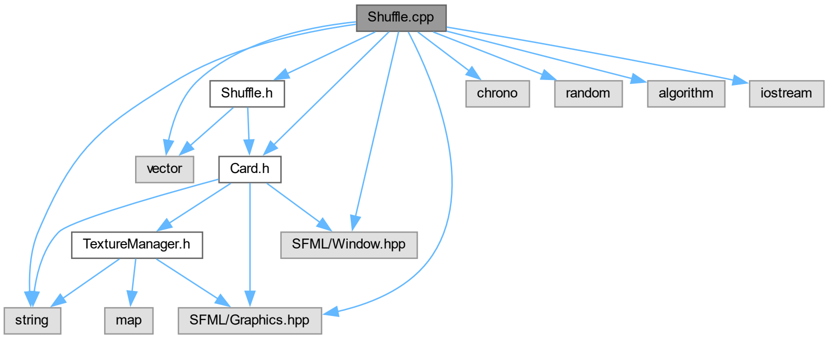
Go to the documentation of this file.

```
/*********************************************************************/
#pragma once

#include <string>
#include <sstream>
#include <vector>
#include <iostream>
#include <string.h>
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
using namespace sf;

class Player {
    int points;
    int currentRecord;
    std::string Login;
    std::string Password;
    std::string timeRecord;
public:
    void addPoints(int points);
    int getPoints();
    void setPoints(int points);
    void setCurrentRecord(int record);
    int getCurrentRecord();
    void setLogin(std::string login);
    std::string getLogin();
    void setPassword(std::string password);
    std::string getPassword();
    void setTimeRecord(std::string timeRecord);
    std::string getTimeRecord();
    Player operator+(int points);
    Player operator-(int points);
    Player(std::string login, std::string password, int record, std::string timeRecord);
    void checkTimeRecord(Text& time, int hours, int minutes, int seconds);
};
```

5.23 Shuffle.cpp File Reference

```
#include ¨Shuffle.h¨
#include ¨Card.h¨
#include <chrono>
#include <random>
#include <algorithm>
#include <iostream>
#include <vector>
#include <string>
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
```

Include dependency graph for Shuffle.cpp:

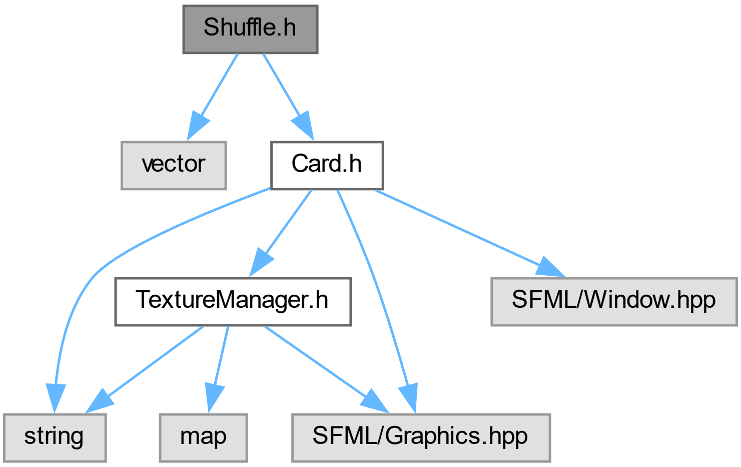


5.24 Shuffle.h File Reference

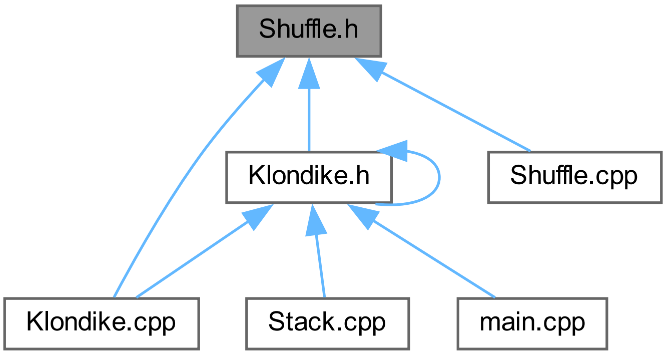
Class being used to generate and shuffle card deck.

```
#include <vector>
#include ¨Card.h¨
```

Include dependency graph for Shuffle.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Shuffle

5.24.1 Detailed Description

Class being used to generate and shuffle card deck.

Author

Karol Ziaja

Date

August 2023

5.25 Shuffle.h

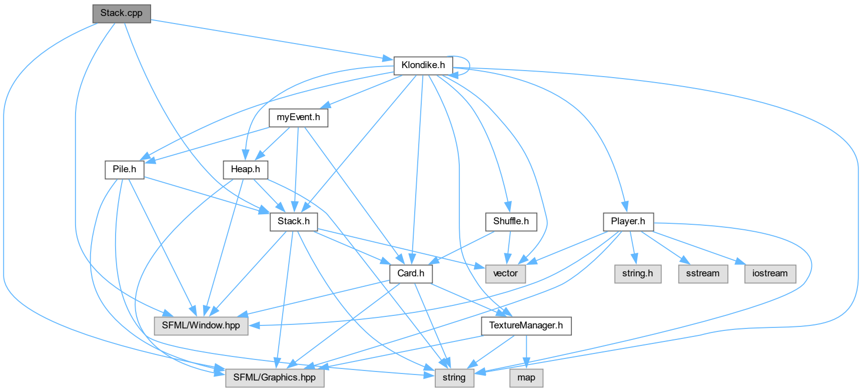
Go to the documentation of this file.

```
/***********************************************************************/
#pragma once

#include <vector>
#include "Card.h"

class Shuffle {
public:
    static std::vector<Card> GenerateDeck();
    static std::vector<Card> ShuffleDeck(std::vector<Card> Deck);
};
```

5.26 Stack.cpp File Reference

```
#include ¨Stack.h¨
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
#include ¨Klondike.h¨
```

Include dependency graph for Stack.cpp:



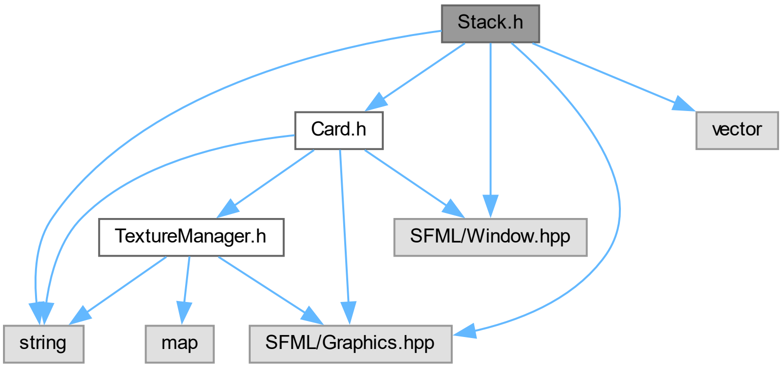
5.27 Stack.h File Reference

Stack class, heap and pile classes inherit from this class.

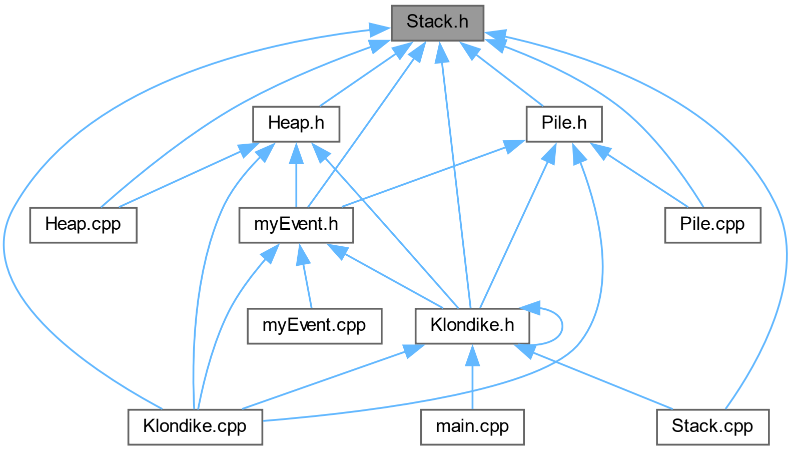
```
#include ¨Card.h¨
#include <string>
#include <vector>
```

```
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>
```

Include dependency graph for Stack.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Stack

5.27.1 Detailed Description

Stack class, heap and pile classes inherit from this class.

Author

Karol Ziaja

Date

August 2023

5.28 Stack.h

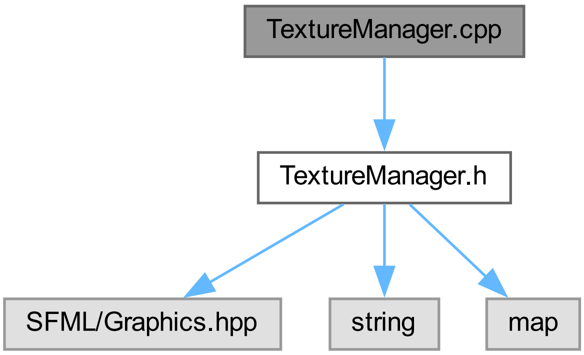
Go to the documentation of this file.

```
/*****************************************************************/
#pragma once

#include "Card.h"
#include <string>
#include <vector>
#include <SFML/Graphics.hpp>
#include <SFML/Window.hpp>

using namespace sf;

class Stack : public sf::Drawable{
    std::string stackType;
public:
    int id;
    std::vector<Card> cards;
    RectangleShape Shape;
    float pos_X;
    float pos_Y;
    const float width = 60;
    const float height = 90;
    Stack(const int number, float RectangleX, float RectangleY, std::string stackType);
    Stack();
    ~Stack() = default;
    void virtual draw(RenderTarget& target, RenderStates state) const override;
    void virtual setPos(float x, float y);
    void virtual addCard(Card card);
    void virtual removeCards(int number);
    void virtual removeFirstCard();
    Card virtual returnLastCard();
    std::pair<float, float> getPos();
    bool isLastInStack(Card& card);
    int returnCardInStackIndex(int card);
    RectangleShape getShape();
    std::string getStackType();
};


```

5.29 TextureManager.cpp File Reference

```
#include ¨TextureManager.h¨
```

Include dependency graph for TextureManager.cpp:

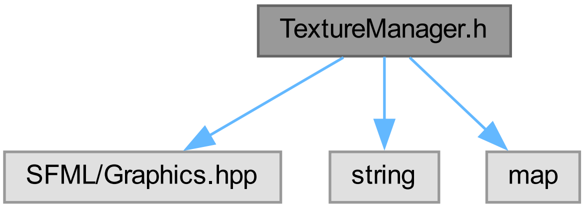


5.30 TextureManager.h File Reference

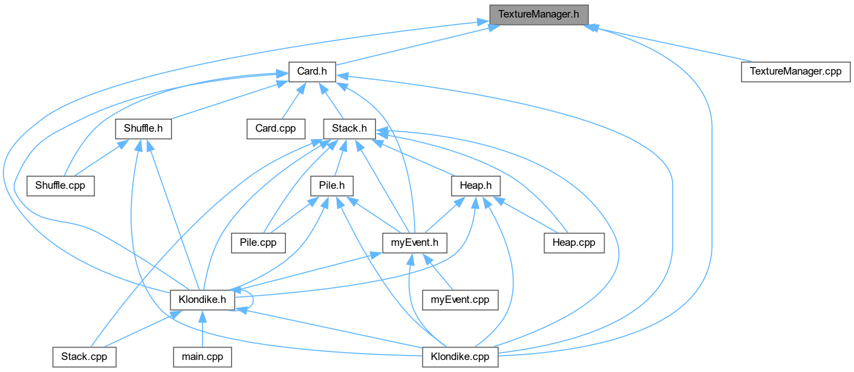
Class that manages all loaded textures from files.

```
#include <SFML/Graphics.hpp>
#include <string>
#include <map>
```

Include dependency graph for TextureManager.h:



This graph shows which files directly or indirectly include this file:



Classes

- class TextureManager

5.30.1 Detailed Description

Class that manages all loaded textures from files.

Author

https://github.com/netpoetica

Date

August 2023

5.31 TextureManager.h

Go to the documentation of this file.

```
/*****************************************************************/
#ifndef TEXTUREMANAGER_H
#define TEXTUREMANAGER_H

#include <SFML/Graphics.hpp>
#include <string>
#include <map>

using namespace std;

class TextureManager
{
    static map<string, sf::Texture*> textures;

    static std::vector<string> order;

    TextureManager();
public:
    ~TextureManager();

    static int getLength();

    static sf::Texture* getTexture(string name);

    static sf::Texture* getTexture(int index);

    static sf::Texture* loadTexture(string name, string path);
};

#endif
```

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