HelloWorld

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Chapter 1

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2.1 File List

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Chapter 3

Class Documentation

3.1 AssetsManager Class Reference

A class which manages visual and sound assets.

`#include <AssetsManager.h>`

Public Member Functions

- AssetsManager (void)

  Constructor for the AssetsManager class.
- void loadFont (std::string, std::string)

  Method to load a font and insert it into the font map.
- void loadTexture (std::string, std::string)

  Method to load a texture and insert it into the texture map.
- void loadSound (std::string, std::string)

  Method to load a sound and insert it into the sound map. Automatically creates a corresponding sf::SoundBuffer.
- void loadTrack (std::string, std::string)

  Method to load a track (sf::Music) and insert it into the track map.
- sf::Font * getFont (std::string)

  Method to get font associated with given font key.
- sf::Texture * getTexture (std::string)

  Method to get texture associated with given texture key.
- sf::SoundBuffer * getSoundBuffer (std::string)

  Method to get soundbuffer associated with given sound key.
- sf::Sound * getSound (std::string)

  Method to get sound associated with given sound key.
- void playTrack (void)

  Method to play the current track.
- void pauseTrack (void)

  Method to pause the current track.
- void stopTrack (void)

  Method to stop the current track.
- void nextTrack (void)

  Method to advance to the next track. Wraps around if the end of the track map is reached.

- void previousTrack (void)

  Method to return to the previous track. Wraps around if the beginning of the track map is reached.
- std::string getCurrentTrackKey (void)

  Method to get track key for current track.
- sf::SoundSource::Status getTrackStatus (void)

  Method to get the status of the current track.
- void clear (void)

  Method to clear all loaded assets.
- ~AssetsManager (void)

  Destructor for the AssetsManager class.

Private Member Functions

- void __loadSoundBuffer (std::string, std::string)

  Helper method to load a soundbuffer and insert it into the soundbuffer map. Should only be called by loadSound(), to create an sf::SoundBuffer corresponding to the loaded sf::Sound.

Private Attributes

- std::map< std::string, sf::Font * > font_map

  A map of pointers to loaded fonts.
- std::map< std::string, sf::Texture * > texture_map

  A map of pointers to loaded textures.
- std::map< std::string, sf::SoundBuffer * > soundbuffer_map

  A map of pointers to sound buffers.
- std::map< std::string, sf::Sound * > sound_map

  A map of pointers to loaded sounds.
- std::map< std::string, sf::Music * >::iterator current_track

  A map iterator which corresponds to the current track (i.e., the track currently being played).
- std::map< std::string, sf::Music * > track_map

  A map of pointers to opened tracks (i.e. sf::Music).

3.1.1 Detailed Description

A class which manages visual and sound assets.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 AssetsManager()

```
AssetsManager::AssetsManager (
            void  )
```

Constructor for the AssetsManager class.

```
110 {
111     //...
112
113     std::cout « "AssetsManager constructed at " « this « std::endl;
114
115     return;
116 }   /* AssetsManager() */
```

3.1.2.2 ~AssetsManager()

```
AssetsManager::~AssetsManager (
            void  )
```

Destructor for the AssetsManager class.

```
738 {
739     this->clear();
740
741     std::cout « "AssetsManager at " « this « " destroyed" « std::endl;
742
743     return;
744 }   /* ~AssetsManager() */
```

3.1.3 Member Function Documentation

3.1.3.1 __loadSoundBuffer()

```
void AssetsManager::__loadSoundBuffer (
            std::string path_2_sound,
            std::string sound_key )  [private]
```

Helper method to load a soundbuffer and insert it into the soundbuffer map. Should only be called by loadSound(), to create an sf::SoundBuffer corresponding to the loaded sf::Sound.

Parameters

path_2_sound	A path (either relative or absolute) to the sound file.
sound_key	A key associated with the sound (for indexing into the soundbuffer map).

```
47 {
48     //  1. check key, throw error if already in use
49     if (this->soundbuffer_map.count(sound_key) > 0) {
50         std::string error_str = "ERROR  AssetsManager::__loadSoundBuffer()  sound key ";
51         error_str += sound_key;
52         error_str += " is already in use";
53
54         this->clear();
55
56         #ifdef _WIN32
57             std::cout « error_str « std::endl;
58         #endif  /* _WIN32 */
59
60         throw std::runtime_error(error_str);
61     }
62
63
64     //  2. load from file, throw error on fail
65     sf::SoundBuffer* soundbuffer_ptr = new sf::SoundBuffer();
66
67     if (not soundbuffer_ptr->loadFromFile(path_2_sound)) {
68         std::string error_str = "ERROR  AssetsManager::__loadSoundBuffer()  could not load ";
69         error_str += "soundbuffer at ";
70         error_str += path_2_sound;
71
72         this->clear();
73
74         #ifdef _WIN32
75             std::cout « error_str « std::endl;
76         #endif  /* _WIN32 */
77
78         throw std::runtime_error(error_str);
79     }
80
81
```

```
82      //  3. insert into soundbuffer map
83      this->soundbuffer_map.insert(
84          std::pair<std::string, sf::SoundBuffer*>(sound_key, soundbuffer_ptr)
85      );
86
87      std::cout « "SoundBuffer " « sound_key « " inserted into soundbuffer map" «
88          std::endl;
89
90      return;
91  }   /* __loadSoundBuffer() */
```

3.1.3.2 clear()

```
void AssetsManager::clear (
            void  )
```

Method to clear all loaded assets.

```
646 {
647     //  1. clear fonts
648     std::map<std::string, sf::Font*>::iterator font_iter;
649     for (
650         font_iter = this->font_map.begin();
651         font_iter != this->font_map.end();
652         font_iter++
653     ) {
654         delete font_iter->second;
655
656         std::cout « "Font " « font_iter->first « " deleted from font map" «
657             std::endl;
658     }
659     this->font_map.clear();
660
661
662     //  2. clear textures
663     std::map<std::string, sf::Texture*>::iterator texture_iter;
664     for (
665         texture_iter = this->texture_map.begin();
666         texture_iter != this->texture_map.end();
667         texture_iter++
668     ) {
669         delete texture_iter->second;
670
671         std::cout « "Texture " « texture_iter->first « " deleted from texture map" «
672             std::endl;
673     }
674     this->texture_map.clear();
675
676
677     //  3. clear sound buffers
678     std::map<std::string, sf::SoundBuffer*>::iterator soundbuffer_iter;
679     for (
680         soundbuffer_iter = this->soundbuffer_map.begin();
681         soundbuffer_iter != this->soundbuffer_map.end();
682         soundbuffer_iter++
683     ) {
684         delete soundbuffer_iter->second;
685
686         std::cout « "SoundBuffer " « soundbuffer_iter->first «
687             " deleted from soundbuffer map" « std::endl;
688     }
689     this->soundbuffer_map.clear();
690
691
692     //  4. clear sounds
693     std::map<std::string, sf::Sound*>::iterator sound_iter;
694     for (
695         sound_iter = this->sound_map.begin();
696         sound_iter != this->sound_map.end();
697         sound_iter++
698     ) {
699         delete sound_iter->second;
700
701         std::cout « "Sound " « sound_iter->first « " deleted from sound map" «
702             std::endl;
703     }
704     this->sound_map.clear();
705
706
```

```
707     //  5. clear tracks
708     this->stopTrack();
709     std::map<std::string, sf::Music*>::iterator track_iter;
710     for (
711         track_iter = this->track_map.begin();
712         track_iter != this->track_map.end();
713         track_iter++
714     ) {
715         delete track_iter->second;
716 
717         std::cout « "Track " « track_iter->first « " deleted from track map" «
718             std::endl;
719     }
720     this->track_map.clear();
721 
722     return;
723 }   /* clear() */
```

3.1.3.3 getCurrentTrackKey()

```
std::string AssetsManager::getCurrentTrackKey (
              void  )
```

Method to get track key for current track.

Returns

The track key for the current track.

```
610 {
611     return this->current_track->first;
612 }   /* getCurrentTrackKey() */
```

3.1.3.4 getFont()

```
sf::Font * AssetsManager::getFont (
              std::string font_key )
```

Method to get font associated with given font key.

Parameters

font_key	A key associated with the font (for indexing into the font map).

Returns

A pointer to the corresponding font.

```
351 {
352     //  1. check key, throw error if not found
353     if (this->font_map.count(font_key) <= 0) {
354         std::string error_str = "ERROR  AssetsManager::getFont()  font key ";
355         error_str += font_key;
356         error_str += " is not contained in font map";
357 
358         this->clear();
359 
360         #ifdef _WIN32
361             std::cout « error_str « std::endl;
```

```
362         #endif  /* _WIN32 */
363
364         throw std::runtime_error(error_str);
365     }
366
367     return this->font_map[font_key];
368 }   /* getFont() */
```

3.1.3.5 getSound()

```
sf::Sound * AssetsManager::getSound (
            std::string sound_key )
```

Method to get sound associated with given sound key.

Parameters

sound_key	A key associated with the sound (for indexing into the sound map).

Returns

A pointer to the corresponding sound.

```
461 {
462     //  1. check key, throw error if not found
463     if (this->sound_map.count(sound_key) <= 0) {
464         std::string error_str = "ERROR  AssetsManager::getSound()  sound key ";
465         error_str += sound_key;
466         error_str += " is not contained in sound map";
467
468         this->clear();
469
470         #ifdef _WIN32
471             std::cout « error_str « std::endl;
472         #endif  /* _WIN32 */
473
474         throw std::runtime_error(error_str);
475     }
476
477     return this->sound_map[sound_key];
478 }   /* getSound() */
```

3.1.3.6 getSoundBuffer()

```
sf::SoundBuffer * AssetsManager::getSoundBuffer (
            std::string sound_key )
```

Method to get soundbuffer associated with given sound key.

Parameters

sound_key	A key associated with the soundbuffer (for indexing into the soundbuffer map).

Returns

A pointer to the corresponding soundbuffer.

```
425 {
426     //  1. check key, throw error if not found
427     if (this->soundbuffer_map.count(sound_key) <= 0) {
428         std::string error_str = "ERROR  AssetsManager::getSoundBuffer()  sound key ";
429         error_str += sound_key;
430         error_str += " is not contained in soundbuffer map";
431 
432         this->clear();
433 
434         #ifdef _WIN32
435             std::cout « error_str « std::endl;
436         #endif  /* _WIN32 */
437 
438         throw std::runtime_error(error_str);
439     }
440 
441     return this->soundbuffer_map[sound_key];
442 }   /* getSoundBuffer() */
```

3.1.3.7 getTexture()

```
sf::Texture * AssetsManager::getTexture (
            std::string texture_key )
```

Method to get texture associated with given texture key.

Parameters

texture_key	A key associated with the texture (for indexing into the texture map).

Returns

A pointer to the corresponding texture.

```
388 {
389     //  1. check key, throw error if not found
390     if (this->texture_map.count(texture_key) <= 0) {
391         std::string error_str = "ERROR  AssetsManager::getTexture()  texture key ";
392         error_str += texture_key;
393         error_str += " is not contained in texture map";
394 
395         this->clear();
396 
397         #ifdef _WIN32
398             std::cout « error_str « std::endl;
399         #endif  /* _WIN32 */
400 
401         throw std::runtime_error(error_str);
402     }
403 
404     return this->texture_map[texture_key];
405 }   /* getTexture() */
```

3.1.3.8 getTrackStatus()

```
sf::SoundSource::Status AssetsManager::getTrackStatus (
            void  )
```

Method to get the status of the current track.

Returns

The status of the current track.

```
629 {
630     return this->current_track->second->getStatus();
631 }   /* getTrackStatus */
```

3.1.3.9 loadFont()

```
void AssetsManager::loadFont (
            std::string path_2_font,
            std::string font_key )
```

Method to load a font and insert it into the font map.

Parameters

path_2_font	A path (either relative or absolute) to the font file.
font_key	A key associated with the font (for indexing into the font map).

```
135 {
136     //  1. check key, throw error if already in use
137     if (this->font_map.count(font_key) > 0) {
138         std::string error_str = "ERROR  AssetsManager::loadFont()  font key ";
139         error_str += font_key;
140         error_str += " is already in use";
141 
142         this->clear();
143 
144         #ifdef _WIN32
145             std::cout « error_str « std::endl;
146         #endif  /* _WIN32 */
147 
148         throw std::runtime_error(error_str);
149     }
150 
151 
152     //  2. load from file, throw error on fail
153     sf::Font* font_ptr = new sf::Font();
154 
155     if (not font_ptr->loadFromFile(path_2_font)) {
156         std::string error_str = "ERROR  AssetsManager::loadFont()  could not load ";
157         error_str += "font at ";
158         error_str += path_2_font;
159 
160         this->clear();
161 
162         #ifdef _WIN32
163             std::cout « error_str « std::endl;
164         #endif  /* _WIN32 */
165 
166         throw std::runtime_error(error_str);
167     }
168 
169 
170     //  3. insert into font map
171     this->font_map.insert(std::pair<std::string, sf::Font*>(font_key, font_ptr));
172 
173     std::cout « "Font " « font_key « " inserted into font map" « std::endl;
174 
175     return;
176 }   /* loadFont() */
```

3.1.3.10 loadSound()

```
void AssetsManager::loadSound (
```

```
            std::string path_2_sound,
            std::string sound_key )
```

Method to load a sound and insert it into the sound map. Automatically creates a corresponding sf::SoundBuffer.

Parameters

path_2_sound	A path (either relative or absolute) to the sound file.
sound_key	A key associated with the sound (for indexing into the sound map).

```
259 {
260     //  1. create an associated sf::SoundBuffer
261     this->__loadSoundBuffer(path_2_sound, sound_key);
262 
263     //  2. associate sf::Sound with sf::SoundBuffer
264     sf::Sound* sound_ptr = new sf::Sound();
265     sound_ptr->setBuffer(*(this->soundbuffer_map[sound_key]));
266 
267     //  3. insert into sound map
268     this->sound_map.insert(std::pair<std::string, sf::Sound*>(sound_key, sound_ptr));
269 
270     std::cout « "Sound " « sound_key « " inserted into sound map" « std::endl;
271 
272     return;
273 }   /* loadSound() */
```

3.1.3.11 loadTexture()

```
void AssetsManager::loadTexture (
            std::string path_2_texture,
            std::string texture_key )
```

Method to load a texture and insert it into the texture map.

Parameters

path_2_texture	A path (either relative or absolute) to the texture file.
texture_key	A key associated with the texture (for indexing into the texture map).

```
196 {
197     //  1. check key, throw error if already in use
198     if (this->texture_map.count(texture_key) > 0) {
199         std::string error_str = "ERROR  AssetsManager::loadTexture()  texture key ";
200         error_str += texture_key;
201         error_str += " is already in use";
202 
203         this->clear();
204 
205         #ifdef _WIN32
206             std::cout « error_str « std::endl;
207         #endif  /* _WIN32 */
208 
209         throw std::runtime_error(error_str);
210     }
211 
212 
213     //  2. load from file, throw error on fail
214     sf::Texture* texture_ptr = new sf::Texture();
215 
216     if (not texture_ptr->loadFromFile(path_2_texture)) {
217         std::string error_str = "ERROR  AssetsManager::loadTexture()  could not load ";
218         error_str += "texture at ";
219         error_str += path_2_texture;
220 
221         this->clear();
222 
223         #ifdef _WIN32
224             std::cout « error_str « std::endl;
```

```
225         #endif  /* _WIN32 */
226
227         throw std::runtime_error(error_str);
228     }
229
230
231     //  3. insert into texture map
232     this->texture_map.insert(
233         std::pair<std::string, sf::Texture*>(texture_key, texture_ptr)
234     );
235
236     std::cout « "Texture " « texture_key « " inserted into texture map" « std::endl;
237
238     return;
239 }   /* loadTexture() */
```

3.1.3.12 loadTrack()

```
void AssetsManager::loadTrack (
              std::string path_2_track,
              std::string track_key )
```

Method to load a track (sf::Music) and insert it into the track map.

Parameters

path_2_track	A path (either relative or absolute) to the track file.
track_key	A key associated with the track (for indexing into the track map).

```
292 {
293     //  1. check key, throw error if already in use
294     if (this->track_map.count(track_key) > 0) {
295         std::string error_str = "ERROR  AssetsManager::loadTrack()  track key ";
296         error_str += track_key;
297         error_str += " is already in use";
298
299         this->clear();
300
301         #ifdef _WIN32
302             std::cout « error_str « std::endl;
303         #endif  /* _WIN32 */
304
305         throw std::runtime_error(error_str);
306     }
307
308     //  2. open from file, throw error on fail
309     sf::Music* track_ptr = new sf::Music();
310
311     if (not track_ptr->openFromFile(path_2_track)) {
312         std::string error_str = "ERROR  AssetsManager::loadTrack()  could not open ";
313         error_str += "track at ";
314         error_str += path_2_track;
315
316         this->clear();
317
318         #ifdef _WIN32
319             std::cout « error_str « std::endl;
320         #endif  /* _WIN32 */
321
322         throw std::runtime_error(error_str);
323     }
324
325     //  3. insert into track map
326     this->track_map.insert(std::pair<std::string, sf::Music*>(track_key, track_ptr));
327     this->current_track = this->track_map.begin();
328
329     std::cout « "Track " « track_key « " inserted into track map" « std::endl;
330
331     return;
332 }   /* loadTrack() */
```

3.1.3.13 nextTrack()

```
void AssetsManager::nextTrack (
            void  )
```

Method to advance to the next track. Wraps around if the end of the track map is reached.

```
551 {
552     //  1. stop current track
553     this->stopTrack();
554 
555     //  2. increment current track
556     this->current_track++;
557 
558     //  3. handle wrap around
559     if (this->current_track == this->track_map.end()) {
560         this->current_track = this->track_map.begin();
561     }
562 
563     return;
564 }   /* nextTrack() */
```

3.1.3.14 pauseTrack()

```
void AssetsManager::pauseTrack (
            void  )
```

Method to pause the current track.

```
512 {
513     this->current_track->second->pause();
514 
515     return;
516 }   /* pauseTrack() */
```

3.1.3.15 playTrack()

```
void AssetsManager::playTrack (
            void  )
```

Method to play the current track.

```
493 {
494     this->current_track->second->play();
495 
496     return;
497 }   /* playTrack() */
```

3.1.3.16 previousTrack()

```
void AssetsManager::previousTrack (
            void  )
```

Method to return to the previous track. Wraps around if the beginning of the track map is reached.

```
580 {
581     //  1. stop current track
582     this->stopTrack();
583 
584     //  2. handle wrap around
585     if (this->current_track == this->track_map.begin()) {
586         this->current_track = this->track_map.end();
587     }
588 
589     //  3. decrement current track
590     this->current_track--;
591 
592     return;
593 }   /* previousTrack() */
```

3.1.3.17 stopTrack()

```
void AssetsManager::stopTrack (
            void  )
```

Method to stop the current track.

```
531 {
532     this->current_track->second->stop();
533
534     return;
535 }   /* stopTrack() */
```

3.1.4 Member Data Documentation

3.1.4.1 current_track

```
std::map<std::string, sf::Music*>::iterator AssetsManager::current_track  [private]
```

A map iterator which corresponds to the current track (i.e., the track currently being played).

3.1.4.2 font_map

```
std::map<std::string, sf::Font*> AssetsManager::font_map  [private]
```

A map of pointers to loaded fonts.

3.1.4.3 sound_map

```
std::map<std::string, sf::Sound*> AssetsManager::sound_map  [private]
```

A map of pointers to loaded sounds.

3.1.4.4 soundbuffer_map

```
std::map<std::string, sf::SoundBuffer*> AssetsManager::soundbuffer_map  [private]
```

A map of pointers to sound buffers.

3.1.4.5 texture_map

```
std::map<std::string, sf::Texture*> AssetsManager::texture_map  [private]
```

A map of pointers to loaded textures.

3.1.4.6 track_map

```
std::map<std::string, sf::Music*> AssetsManager::track_map  [private]
```

A map of pointers to opened tracks (i.e. sf::Music).

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

- header/ESC_core/AssetsManager.h
- source/ESC_core/AssetsManager.cpp

3.2 InputsHandler Class Reference

A class which handles inputs from peripherals (i.e., keyboard and mouse).

```
#include <InputsHandler.h>
```

Public Member Functions

- InputsHandler (void)

  Constructor for the InputsHandler class.
- void process (sf::Event *)
- void printKeysPressed (void)

  Method to print out which keys are currently pressed.
- void reset (void)

  Method to reset InputsHandler. To be called once per frame (at end of frame!).
- ~InputsHandler (void)

  Destructor for the InputsHandler class.

Public Attributes

- std::vector< bool > key_pressed_once_vec

  A vector (bool) which indicates which keys have been pressed once. Useful for discrete inputs.
- std::vector< bool > key_press_vec

  A vector <bool> which indicates which keys are currently pressed. Useful for smooth movement.
- std::map< sf::Keyboard::Key, std::string > key_code_map

  A map from key codes to corresponding string representations.

Private Member Functions

- void __constructKeyCodeMap (void)

  Helper method to construct a map from sf::Keyboard::Key to a string representation of the corresponding key.

3.2.1 Detailed Description

A class which handles inputs from peripherals (i.e., keyboard and mouse).

3.2.2 Constructor & Destructor Documentation

3.2.2.1 InputsHandler()

```
InputsHandler::InputsHandler (
            void  )
```

Constructor for the InputsHandler class.

```
379 {
380     this->key_pressed_once_vec.resize(sf::Keyboard::KeyCount, false);
381     this->key_press_vec.resize(sf::Keyboard::KeyCount, false);
382 
383     this->__constructKeyCodeMap();
384 
385     std::cout << "InputsHandler constructed at " << this << std::endl;
386 
387     return;
388 }   /* InputsHandler() */
```

3.2.2.2 ~InputsHandler()

```
InputsHandler::~InputsHandler (
            void  )
```

Destructor for the InputsHandler class.

```
499 {
500     std::cout << "InputsHandler at " << this << " destroyed" << std::endl;
501 
502     return;
503 }   /* ~InputsHandler() */
```

3.2.3 Member Function Documentation

3.2.3.1 __constructKeyCodeMap()

```
void InputsHandler::__constructKeyCodeMap (
            void  )  [private]
```

Helper method to construct a map from sf::Keyboard::Key to a string representation of the corresponding key.

```
35 {
36     //  1. unknown keys
37     this->key_code_map.insert(
38         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Unknown, "Unknown")
39     );
40 
41 
42     //  2. alpha keys
43     this->key_code_map.insert(
44         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::A, "A")
45     );
46     this->key_code_map.insert(
47         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::B, "B")
48     );
49     this->key_code_map.insert(
50         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::C, "C")
51     );
52     this->key_code_map.insert(
53         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::D, "D")
54     );
55     this->key_code_map.insert(
56         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::E, "E")
57     );
58     this->key_code_map.insert(
59         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F, "F")
60     );
61     this->key_code_map.insert(
62         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::G, "G")
63     );
64     this->key_code_map.insert(
65         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::H, "H")
66     );
67     this->key_code_map.insert(
68         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::I, "I")
69     );
70     this->key_code_map.insert(
71         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::J, "J")
72     );
73     this->key_code_map.insert(
74         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::K, "K")
75     );
76     this->key_code_map.insert(
77         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::L, "L")
78     );
79     this->key_code_map.insert(
80         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::M, "M")
81     );
82     this->key_code_map.insert(
83         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::N, "N")
84     );
85     this->key_code_map.insert(
86         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::O, "O")
87     );
88     this->key_code_map.insert(
89         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::P, "P")
90     );
91     this->key_code_map.insert(
92         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Q, "Q")
93     );
94     this->key_code_map.insert(
95         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::R, "R")
96     );
97     this->key_code_map.insert(
98         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::S, "S")
99     );
100     this->key_code_map.insert(
101         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::T, "T")
102     );
103     this->key_code_map.insert(
104         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::U, "U")
105     );
106     this->key_code_map.insert(
107         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::V, "V")
108     );
109     this->key_code_map.insert(
110         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::W, "W")
111     );
112     this->key_code_map.insert(
```

```
113         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::X, "X")
114     );
115     this->key_code_map.insert(
116         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Y, "Y")
117     );
118     this->key_code_map.insert(
119         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Z, "Z")
120     );
121 
122 
123     //  3. numeric keys
124     this->key_code_map.insert(
125         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num0, "0")
126     );
127     this->key_code_map.insert(
128         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num1, "1")
129     );
130     this->key_code_map.insert(
131         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num2, "2")
132     );
133     this->key_code_map.insert(
134         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num3, "3")
135     );
136     this->key_code_map.insert(
137         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num4, "4")
138     );
139     this->key_code_map.insert(
140         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num5, "5")
141     );
142     this->key_code_map.insert(
143         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num6, "6")
144     );
145     this->key_code_map.insert(
146         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num7, "7")
147     );
148     this->key_code_map.insert(
149         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num8, "8")
150     );
151     this->key_code_map.insert(
152         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Num9, "9")
153     );
154     this->key_code_map.insert(
155         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad0, "0")
156     );
157     this->key_code_map.insert(
158         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad1, "1")
159     );
160     this->key_code_map.insert(
161         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad2, "2")
162     );
163     this->key_code_map.insert(
164         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad3, "3")
165     );
166     this->key_code_map.insert(
167         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad4, "4")
168     );
169     this->key_code_map.insert(
170         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad5, "5")
171     );
172     this->key_code_map.insert(
173         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad6, "6")
174     );
175     this->key_code_map.insert(
176         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad7, "7")
177     );
178     this->key_code_map.insert(
179         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad8, "8")
180     );
181     this->key_code_map.insert(
182         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Numpad9, "9")
183     );
184 
185 
186     //  4. direction keys
187     this->key_code_map.insert(
188         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Left, "Left")
189     );
190     this->key_code_map.insert(
191         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Right, "Right")
192     );
193     this->key_code_map.insert(
194         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Up, "Up")
195     );
196     this->key_code_map.insert(
197         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Down, "Down")
198     );
199 
```

```
200
201     //  5. function keys
202     this->key_code_map.insert(
203         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F1, "F1")
204     );
205     this->key_code_map.insert(
206         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F2, "F2")
207     );
208     this->key_code_map.insert(
209         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F3, "F3")
210     );
211     this->key_code_map.insert(
212         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F4, "F4")
213     );
214     this->key_code_map.insert(
215         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F5, "F5")
216     );
217     this->key_code_map.insert(
218         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F6, "F6")
219     );
220     this->key_code_map.insert(
221         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F7, "F7")
222     );
223     this->key_code_map.insert(
224         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F8, "F8")
225     );
226     this->key_code_map.insert(
227         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F9, "F9")
228     );
229     this->key_code_map.insert(
230         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F10, "F10")
231     );
232     this->key_code_map.insert(
233         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F11, "F11")
234     );
235     this->key_code_map.insert(
236         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F12, "F12")
237     );
238     this->key_code_map.insert(
239         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F13, "F13")
240     );
241     this->key_code_map.insert(
242         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F14, "F14")
243     );
244     this->key_code_map.insert(
245         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::F15, "F15")
246     );
247
248
249     //  6. other keys
250     this->key_code_map.insert(
251         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Escape, "Escape")
252     );
253     this->key_code_map.insert(
254         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::LControl, "LCtrl")
255     );
256     this->key_code_map.insert(
257         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::LShift, "LShift")
258     );
259     this->key_code_map.insert(
260         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::LAlt, "LAlt")
261     );
262     this->key_code_map.insert(
263         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::LSystem, "LSystem")
264     );
265     this->key_code_map.insert(
266         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::RControl, "RCtrl")
267     );
268     this->key_code_map.insert(
269         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::RShift, "RShift")
270     );
271     this->key_code_map.insert(
272         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::RAlt, "RAlt")
273     );
274     this->key_code_map.insert(
275         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::RSystem, "RSystem")
276     );
277     this->key_code_map.insert(
278         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Menu, "Menu")
279     );
280     this->key_code_map.insert(
281         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::LBracket, "LBracket")
282     );
283     this->key_code_map.insert(
284         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::RBracket, "RBracket")
285     );
286     this->key_code_map.insert(
```

```
287         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Semicolon, "Semicolon")
288     );
289     this->key_code_map.insert(
290         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Comma, "Comma")
291     );
292     this->key_code_map.insert(
293         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Period, "Period")
294     );
295     this->key_code_map.insert(
296         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Quote, "Quote")
297     );
298     this->key_code_map.insert(
299         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Slash, "Slash")
300     );
301     this->key_code_map.insert(
302         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Backslash, "Backslash")
303     );
304     this->key_code_map.insert(
305         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Tilde, "Tilde")
306     );
307     this->key_code_map.insert(
308         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Equal, "Equal")
309     );
310     this->key_code_map.insert(
311         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Hyphen, "Hyphen")
312     );
313     this->key_code_map.insert(
314         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Space, "Space")
315     );
316     this->key_code_map.insert(
317         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Enter, "Enter")
318     );
319     this->key_code_map.insert(
320         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Backspace, "Backspace")
321     );
322     this->key_code_map.insert(
323         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Tab, "Tab")
324     );
325     this->key_code_map.insert(
326         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::PageUp, "PageUp")
327     );
328     this->key_code_map.insert(
329         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::PageDown, "PageDown")
330     );
331     this->key_code_map.insert(
332         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::End, "End")
333     );
334     this->key_code_map.insert(
335         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Home, "Home")
336     );
337     this->key_code_map.insert(
338         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Insert, "Insert")
339     );
340     this->key_code_map.insert(
341         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Delete, "Delete")
342     );
343     this->key_code_map.insert(
344         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Add, "Add")
345     );
346     this->key_code_map.insert(
347         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Subtract, "Subtract")
348     );
349     this->key_code_map.insert(
350         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Multiply, "Multiply")
351     );
352     this->key_code_map.insert(
353         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Divide, "Divide")
354     );
355     this->key_code_map.insert(
356         std::pair<sf::Keyboard::Key, std::string>(sf::Keyboard::Pause, "Pause")
357     );
358
359     return;
360 }   /* __constructKeyCodeMap() */
```

3.2.3.2 printKeysPressed()

```
void InputsHandler::printKeysPressed (
            void  )
```

Method to print out which keys are currently pressed.

```
448 {
449     std::string print_str = "";
450 
451     for (size_t i = 0; i < this->key_press_vec.size(); i++) {
452         if (this->key_press_vec[i]) {
453             print_str += this->key_code_map[sf::Keyboard::Key(i)];
454             print_str += ", ";
455         }
456     }
457 
458     if (not print_str.empty()) {
459         std::cout « "Keys pressed: " « print_str « std::endl;
460     }
461 
462     return;
463 }   /* printKeysPressed() */
```

3.2.3.3 process()

```
void InputsHandler::process (
              sf::Event * event_ptr )
405 {
406     //  1. update state of key press vectors
407     switch (event_ptr->type) {
408         case (sf::Event::KeyPressed): {
409             if (not this->key_press_vec[event_ptr->key.code]) {
410                 this->key_pressed_once_vec[event_ptr->key.code] = true;
411             }
412 
413             this->key_press_vec[event_ptr->key.code] = true;
414 
415             break;
416         }
417 
418         case (sf::Event::KeyReleased): {
419             this->key_pressed_once_vec[event_ptr->key.code] = false;
420             this->key_press_vec[event_ptr->key.code] = false;
421 
422             break;
423         }
424 
425         default: {
426             //  do nothing!
427 
428             break;
429         }
430     }
431 
432     return;
433 }   /* process() */
```

3.2.3.4 reset()

```
void InputsHandler::reset (
              void  )
```

Method to reset InputsHandler. To be called once per frame (at end of frame!).

```
478 {
479     for (size_t i = 0; i < this->key_press_vec.size(); i++) {
480         this->key_pressed_once_vec[i] = false;
481     }
482 
483     return;
484 }   /* reset() */
```

3.2.4 Member Data Documentation

3.2.4.1 key_code_map

```
std::map<sf::Keyboard::Key, std::string> InputsHandler::key_code_map
```

A map from key codes to corresponding string representations.

3.2.4.2 key_press_vec

```
std::vector<bool> InputsHandler::key_press_vec
```

A vector <bool> which indicates which keys are currently pressed. Useful for smooth movement.

3.2.4.3 key_pressed_once_vec

```
std::vector<bool> InputsHandler::key_pressed_once_vec
```

A vector (bool) which indicates which keys have been pressed once. Useful for discrete inputs.

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

- header/ESC_core/InputsHandler.h
- source/ESC_core/InputsHandler.cpp

Chapter 4

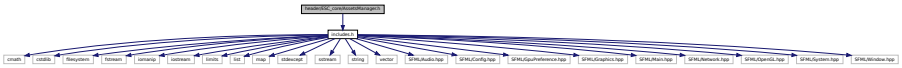
File Documentation

4.1 header/ESC_core/AssetsManager.h File Reference

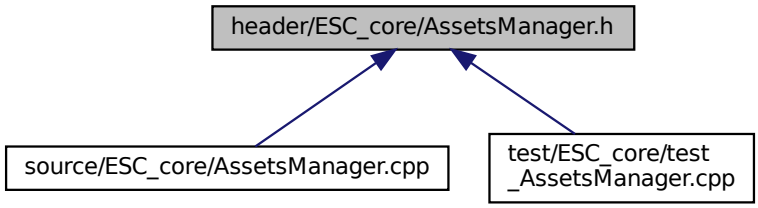
Header file for the AssetsManager class.

```
#include "includes.h"
```

Include dependency graph for AssetsManager.h:



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



Classes

- class AssetsManager

  A class which manages visual and sound assets.

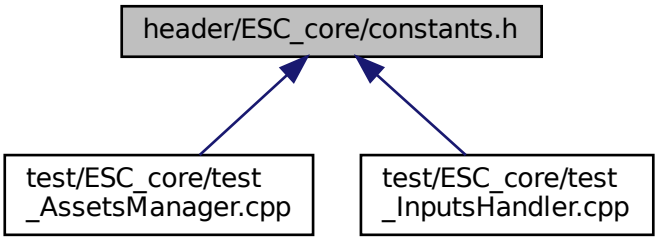
4.1.1 Detailed Description

Header file for the AssetsManager class.

4.2 header/ESC_core/constants.h File Reference

Header file for various constants.

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



Variables

- const int FRAMES_PER_SECOND = 60
- const double SECONDS_PER_FRAME = 1.0 / 60

4.2.1 Detailed Description

Header file for various constants.

4.2.2 Variable Documentation

4.2.2.1 FRAMES_PER_SECOND

```
const int FRAMES_PER_SECOND = 60
```

4.2.2.2 SECONDS_PER_FRAME

```
const double SECONDS_PER_FRAME = 1.0 / 60
```

4.3 header/ESC_core/doxygen_cite.h File Reference

Header file which simply cites the doxygen tool.

4.3.1 Detailed Description

Header file which simply cites the doxygen tool.

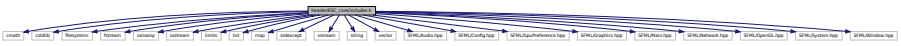
Ref: van Heesch. [2023]

4.4 header/ESC_core/includes.h File Reference

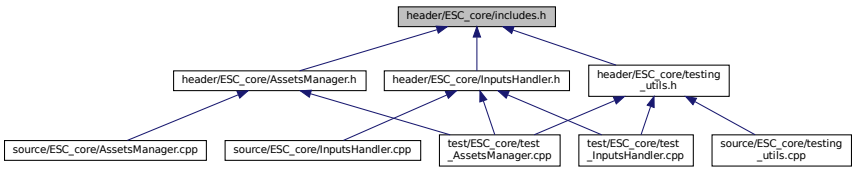
Header file for various includes.

```
#include <cmath>
#include <cstdlib>
#include <filesystem>
#include <fstream>
#include <iomanip>
#include <iostream>
#include <limits>
#include <list>
#include <map>
#include <stdexcept>
#include <sstream>
#include <string>
#include <vector>
#include <SFML/Audio.hpp>
#include <SFML/Config.hpp>
#include <SFML/GpuPreference.hpp>
#include <SFML/Graphics.hpp>
#include <SFML/Main.hpp>
#include <SFML/Network.hpp>
#include <SFML/OpenGL.hpp>
#include <SFML/System.hpp>
#include <SFML/Window.hpp>
```

Include dependency graph for includes.h:



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



4.4.1 Detailed Description

Header file for various includes.

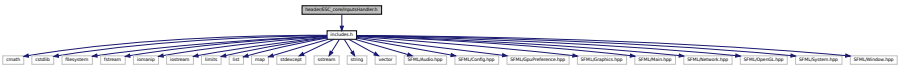
Ref: Gomila [2023]

4.5 header/ESC_core/InputsHandler.h File Reference

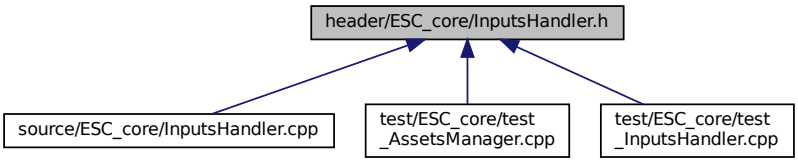
Header file for the InputsHandler class.

```
#include "includes.h"
```

Include dependency graph for InputsHandler.h:



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



Classes

- class InputsHandler

  A class which handles inputs from peripherals (i.e., keyboard and mouse).

4.5.1 Detailed Description

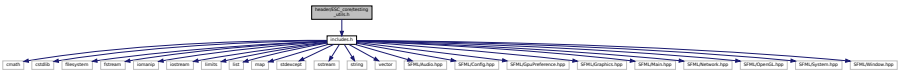
Header file for the InputsHandler class.

4.6 header/ESC_core/testing_utils.h File Reference

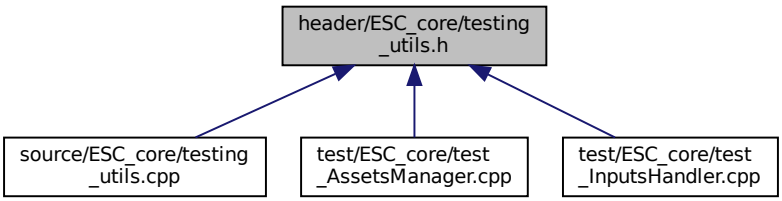
Header file for various testing utilities.

```
#include "includes.h"
```

Include dependency graph for testing_utils.h:



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



Macros

- #define FLOAT_TOLERANCE 1e-6

  A tolerance for application to floating point equality tests.

Functions

- void printGreen (std::string)

  A function that sends green text to std::cout.
- void printGold (std::string)

  A function that sends gold text to std::cout.
- void printRed (std::string)

  A function that sends red text to std::cout.
- void testFloatEquals (double, double, std::string, int)

  Tests for the equality of two floating point numbers x and y (to within FLOAT_TOLERANCE).
- void testGreaterThan (double, double, std::string, int)

  Tests if x > y.
- void testGreaterThanOrEqualTo (double, double, std::string, int)

  Tests if x >= y.
- void testLessThan (double, double, std::string, int)

  Tests if x < y.
- void testLessThanOrEqualTo (double, double, std::string, int)

  Tests if x <= y.
- void testTruth (bool, std::string, int)

  Tests if the given statement is true.
- void expectedErrorNotDetected (std::string, int)

  A utility function to print out a meaningful error message whenever an expected error fails to be thrown/caught/detected.

4.6.1 Detailed Description

Header file for various testing utilities.

This is a library of utility functions used throughout the various test suites.

4.6.2 Macro Definition Documentation

4.6.2.1 FLOAT_TOLERANCE

```
#define FLOAT_TOLERANCE 1e-6
```

A tolerance for application to floating point equality tests.

4.6.3 Function Documentation

4.6.3.1 expectedErrorNotDetected()

```
void expectedErrorNotDetected (
            std::string file,
            int line )
```

A utility function to print out a meaningful error message whenever an expected error fails to be thrown/caught/detected.

Parameters

file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
430 {
431     std::string error_str = "\n ERROR  failed to throw expected error prior to line ";
432     error_str += std::to_string(line);
433     error_str += " of ";
434     error_str += file;
435 
436     #ifdef _WIN32
437         std::cout « error_str « std::endl;
438     #endif
439 
440     throw std::runtime_error(error_str);
441     return;
442 }   /* expectedErrorNotDetected() */
```

4.6.3.2 printGold()

```
void printGold (
            std::string input_str )
```

A function that sends gold text to std::cout.

Parameters

input_str	The text of the string to be sent to std::cout.

```
82 {
83     std::cout « "\x1B[33m" « input_str « "\033[0m";
84     return;
85 }   /* printGold() */
```

4.6.3.3 printGreen()

```
void printGreen (
              std::string input_str )
```

A function that sends green text to std::cout.

Parameters

input_str	The text of the string to be sent to std::cout.

```
62 {
63     std::cout « "\x1B[32m" « input_str « "\033[0m";
64     return;
65 }   /* printGreen() */
```

4.6.3.4 printRed()

```
void printRed (
              std::string input_str )
```

A function that sends red text to std::cout.

Parameters

input_str	The text of the string to be sent to std::cout.

```
102 {
103     std::cout « "\x1B[31m" « input_str « "\033[0m";
104     return;
105 }   /* printRed() */
```

4.6.3.5 testFloatEquals()

```
void testFloatEquals (
              double x,
              double y,
              std::string file,
              int line )
```

Tests for the equality of two floating point numbers *x* and *y* (to within FLOAT_TOLERANCE).

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
136 {
137     if (fabs(x - y) <= FLOAT_TOLERANCE) {
138         return;
139     }
140 
141     std::string error_str = "ERROR: testFloatEquals():\t in ";
142     error_str += file;
143     error_str += "\tline ";
144     error_str += std::to_string(line);
145     error_str += ":\t\n";
146     error_str += std::to_string(x);
147     error_str += " and ";
148     error_str += std::to_string(y);
149     error_str += " are not equal to within +/- ";
150     error_str += std::to_string(FLOAT_TOLERANCE);
151     error_str += "\n";
152 
153     #ifdef _WIN32
154         std::cout « error_str « std::endl;
155     #endif
156 
157     throw std::runtime_error(error_str);
158     return;
159 }   /* testFloatEquals() */
```

4.6.3.6 testGreaterThan()

```
void testGreaterThan (
            double x,
            double y,
            std::string file,
            int line )
```

Tests if x > y.

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
189 {
190     if (x > y) {
191         return;
192     }
193 
194     std::string error_str = "ERROR: testGreaterThan():\t in ";
195     error_str += file;
196     error_str += "\tline ";
197     error_str += std::to_string(line);
198     error_str += ":\t\n";
199     error_str += std::to_string(x);
200     error_str += " is not greater than ";
201     error_str += std::to_string(y);
202     error_str += "\n";
203 
204     #ifdef _WIN32
205         std::cout « error_str « std::endl;
206     #endif
```

```
207
208     throw std::runtime_error(error_str);
209     return;
210 }   /* testGreaterThan() */
```

4.6.3.7 testGreaterThanOrEqualTo()

```
void testGreaterThanOrEqualTo (
             double x,
             double y,
             std::string file,
             int line )
```

Tests if x >= y.

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
240 {
241     if (x >= y) {
242         return;
243     }
244
245     std::string error_str = "ERROR: testGreaterThanOrEqualTo():\t in ";
246     error_str += file;
247     error_str += "\tline ";
248     error_str += std::to_string(line);
249     error_str += ":\t\n";
250     error_str += std::to_string(x);
251     error_str += " is not greater than or equal to ";
252     error_str += std::to_string(y);
253     error_str += "\n";
254
255     #ifdef _WIN32
256         std::cout << error_str << std::endl;
257     #endif
258
259     throw std::runtime_error(error_str);
260     return;
261 }   /* testGreaterThanOrEqualTo() */
```

4.6.3.8 testLessThan()

```
void testLessThan (
             double x,
             double y,
             std::string file,
             int line )
```

Tests if x < y.

Parameters

x	The first of two numbers to test.

Parameters

y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
291 {
292     if (x < y) {
293         return;
294     }
295 
296     std::string error_str = "ERROR: testLessThan():\t in ";
297     error_str += file;
298     error_str += "\tline ";
299     error_str += std::to_string(line);
300     error_str += ":\t\n";
301     error_str += std::to_string(x);
302     error_str += " is not less than ";
303     error_str += std::to_string(y);
304     error_str += "\n";
305 
306     #ifdef _WIN32
307         std::cout « error_str « std::endl;
308     #endif
309 
310     throw std::runtime_error(error_str);
311     return;
312 }   /* testLessThan() */
```

4.6.3.9 testLessThanOrEqualTo()

```
void testLessThanOrEqualTo (
            double x,
            double y,
            std::string file,
            int line )
```

Tests if x <= y.

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
342 {
343     if (x <= y) {
344         return;
345     }
346 
347     std::string error_str = "ERROR: testLessThanOrEqualTo():\t in ";
348     error_str += file;
349     error_str += "\tline ";
350     error_str += std::to_string(line);
351     error_str += ":\t\n";
352     error_str += std::to_string(x);
353     error_str += " is not less than or equal to ";
354     error_str += std::to_string(y);
355     error_str += "\n";
356 
357     #ifdef _WIN32
358         std::cout « error_str « std::endl;
359     #endif
360 
361     throw std::runtime_error(error_str);
362     return;
```

```
363 }   /* testLessThanOrEqualTo() */
```

4.6.3.10 testTruth()

```
void testTruth (
            bool statement,
            std::string file,
            int line )
```

Tests if the given statement is true.

Parameters

statement	The statement whose truth is to be tested ("1 == 0", for example).
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

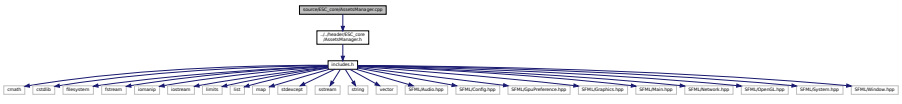
```
390 {
391     if (statement) {
392         return;
393     }
394
395     std::string error_str = "ERROR: testTruth():\t in ";
396     error_str += file;
397     error_str += "\tline ";
398     error_str += std::to_string(line);
399     error_str += ":\t\n";
400     error_str += "Given statement is not true";
401
402     #ifdef _WIN32
403         std::cout « error_str « std::endl;
404     #endif
405
406     throw std::runtime_error(error_str);
407     return;
408 }   /* testTruth() */
```

4.7 source/ESC_core/AssetsManager.cpp File Reference

Implementation file for the AssetsManager class.

```
#include "../../header/ESC_core/AssetsManager.h"
```

Include dependency graph for AssetsManager.cpp:



4.7.1 Detailed Description

Implementation file for the AssetsManager class.

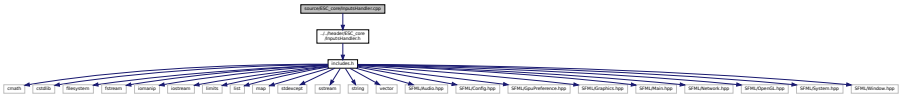
A class which manages visual and sound assets.

4.8 source/ESC_core/InputsHandler.cpp File Reference

Implementation file for the InputsHandler class.

```
#include "../../header/ESC_core/InputsHandler.h"
```

Include dependency graph for InputsHandler.cpp:



4.8.1 Detailed Description

Implementation file for the InputsHandler class.

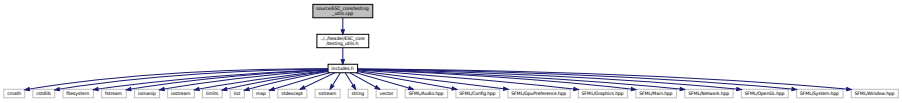
A class which handles inputs from peripherals (i.e., keyboard and mouse).

4.9 source/ESC_core/testing_utils.cpp File Reference

Implementation file for various testing utilities.

```
#include "../../header/ESC_core/testing_utils.h"
```

Include dependency graph for testing_utils.cpp:



Functions

- void printGreen (std::string input_str)

  A function that sends green text to std::cout.
- void printGold (std::string input_str)

  A function that sends gold text to std::cout.
- void printRed (std::string input_str)

  A function that sends red text to std::cout.
- void testFloatEquals (double x, double y, std::string file, int line)

  Tests for the equality of two floating point numbers x and y (to within FLOAT_TOLERANCE).
- void testGreaterThan (double x, double y, std::string file, int line)

  Tests if x > y.
- void testGreaterThanOrEqualTo (double x, double y, std::string file, int line)

  Tests if x >= y.
- void testLessThan (double x, double y, std::string file, int line)

  Tests if x < y.
- void testLessThanOrEqualTo (double x, double y, std::string file, int line)

  Tests if x <= y.
- void testTruth (bool statement, std::string file, int line)

  Tests if the given statement is true.
- void expectedErrorNotDetected (std::string file, int line)

  A utility function to print out a meaningful error message whenever an expected error fails to be thrown/caught/detected.

4.9.1 Detailed Description

Implementation file for various testing utilities.

This is a library of utility functions used throughout the various test suites.

4.9.2 Function Documentation

4.9.2.1 expectedErrorNotDetected()

```
void expectedErrorNotDetected (
            std::string file,
            int line )
```

A utility function to print out a meaningful error message whenever an expected error fails to be thrown/caught/detected.

Parameters

file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
430 {
431     std::string error_str = "\n ERROR  failed to throw expected error prior to line ";
432     error_str += std::to_string(line);
433     error_str += " of ";
434     error_str += file;
435 
436     #ifdef _WIN32
437         std::cout << error_str << std::endl;
438     #endif
439 
440     throw std::runtime_error(error_str);
441     return;
442 }   /* expectedErrorNotDetected() */
```

4.9.2.2 printGold()

```
void printGold (
            std::string input_str )
```

A function that sends gold text to std::cout.

Parameters

input_str	The text of the string to be sent to std::cout.

```
82 {
83     std::cout << "\x1B[33m" << input_str << "\033[0m";
84     return;
85 }   /* printGold() */
```

4.9.2.3 printGreen()

```
void printGreen (
            std::string input_str )
```

A function that sends green text to std::cout.

Parameters

input_str	The text of the string to be sent to std::cout.

```
62 {
63     std::cout « "\x1B[32m" « input_str « "\033[0m";
64     return;
65 }   /* printGreen() */
```

4.9.2.4 printRed()

```
void printRed (
            std::string input_str )
```

A function that sends red text to std::cout.

Parameters

input_str	The text of the string to be sent to std::cout.

```
102 {
103     std::cout « "\x1B[31m" « input_str « "\033[0m";
104     return;
105 }   /* printRed() */
```

4.9.2.5 testFloatEquals()

```
void testFloatEquals (
            double x,
            double y,
            std::string file,
            int line )
```

Tests for the equality of two floating point numbers *x* and *y* (to within FLOAT_TOLERANCE).

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
136 {
137     if (fabs(x - y) <= FLOAT_TOLERANCE) {
138         return;
```

```
139     }
140
141     std::string error_str = "ERROR: testFloatEquals():\t in ";
142     error_str += file;
143     error_str += "\tline ";
144     error_str += std::to_string(line);
145     error_str += ":\t\n";
146     error_str += std::to_string(x);
147     error_str += " and ";
148     error_str += std::to_string(y);
149     error_str += " are not equal to within +/- ";
150     error_str += std::to_string(FLOAT_TOLERANCE);
151     error_str += "\n";
152
153     #ifdef _WIN32
154         std::cout « error_str « std::endl;
155     #endif
156
157     throw std::runtime_error(error_str);
158     return;
159 }   /* testFloatEquals() */
```

4.9.2.6 testGreaterThan()

```
void testGreaterThan (
             double x,
             double y,
             std::string file,
             int line )
```

Tests if x > y.

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
189 {
190     if (x > y) {
191         return;
192     }
193
194     std::string error_str = "ERROR: testGreaterThan():\t in ";
195     error_str += file;
196     error_str += "\tline ";
197     error_str += std::to_string(line);
198     error_str += ":\t\n";
199     error_str += std::to_string(x);
200     error_str += " is not greater than ";
201     error_str += std::to_string(y);
202     error_str += "\n";
203
204     #ifdef _WIN32
205         std::cout « error_str « std::endl;
206     #endif
207
208     throw std::runtime_error(error_str);
209     return;
210 }   /* testGreaterThan() */
```

4.9.2.7 testGreaterThanOrEqualTo()

```
void testGreaterThanOrEqualTo (
             double x,
```

```
            double y,
            std::string file,
            int line )
```

Tests if x >= y.

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
240 {
241     if (x >= y) {
242         return;
243     }
244
245     std::string error_str = "ERROR: testGreaterThanOrEqualTo():\t in ";
246     error_str += file;
247     error_str += "\tline ";
248     error_str += std::to_string(line);
249     error_str += ":\t\n";
250     error_str += std::to_string(x);
251     error_str += " is not greater than or equal to ";
252     error_str += std::to_string(y);
253     error_str += "\n";
254
255     #ifdef _WIN32
256         std::cout << error_str << std::endl;
257     #endif
258
259     throw std::runtime_error(error_str);
260     return;
261 }   /* testGreaterThanOrEqualTo() */
```

4.9.2.8 testLessThan()

```
void testLessThan (
            double x,
            double y,
            std::string file,
            int line )
```

Tests if x < y.

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
291 {
292     if (x < y) {
293         return;
294     }
295
296     std::string error_str = "ERROR: testLessThan():\t in ";
297     error_str += file;
298     error_str += "\tline ";
299     error_str += std::to_string(line);
300     error_str += ":\t\n";
```

```
301     error_str += std::to_string(x);
302     error_str += " is not less than ";
303     error_str += std::to_string(y);
304     error_str += "\n";
305 
306     #ifdef _WIN32
307         std::cout « error_str « std::endl;
308     #endif
309 
310     throw std::runtime_error(error_str);
311     return;
312 }   /* testLessThan() */
```

4.9.2.9 testLessThanOrEqualTo()

```
void testLessThanOrEqualTo (
             double x,
             double y,
             std::string file,
             int line )
```

Tests if x <= y.

Parameters

x	The first of two numbers to test.
y	The second of two numbers to test.
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
342 {
343     if (x <= y) {
344         return;
345     }
346 
347     std::string error_str = "ERROR: testLessThanOrEqualTo():\t in ";
348     error_str += file;
349     error_str += "\tline ";
350     error_str += std::to_string(line);
351     error_str += ":\t\n";
352     error_str += std::to_string(x);
353     error_str += " is not less than or equal to ";
354     error_str += std::to_string(y);
355     error_str += "\n";
356 
357     #ifdef _WIN32
358         std::cout « error_str « std::endl;
359     #endif
360 
361     throw std::runtime_error(error_str);
362     return;
363 }   /* testLessThanOrEqualTo() */
```

4.9.2.10 testTruth()

```
void testTruth (
             bool statement,
             std::string file,
             int line )
```

Tests if the given statement is true.

Parameters

statement	The statement whose truth is to be tested ("1 == 0", for example).
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

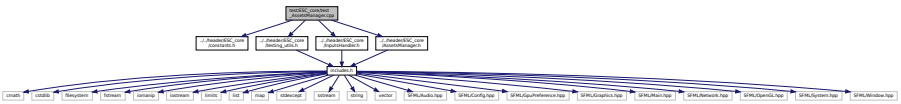
```
390 {
391     if (statement) {
392         return;
393     }
394
395     std::string error_str = "ERROR: testTruth():\t in ";
396     error_str += file;
397     error_str += "\tline ";
398     error_str += std::to_string(line);
399     error_str += ":\t\n";
400     error_str += "Given statement is not true";
401
402     #ifdef _WIN32
403         std::cout « error_str « std::endl;
404     #endif
405
406     throw std::runtime_error(error_str);
407     return;
408 }   /* testTruth() */
```

4.10 test/ESC_core/test_AssetsManager.cpp File Reference

Suite of tests for the AssetsManager class.

```
#include "../../header/ESC_core/constants.h"
#include "../../header/ESC_core/testing_utils.h"
#include "../../header/ESC_core/InputsHandler.h"
#include "../../header/ESC_core/AssetsManager.h"
```

Include dependency graph for test_AssetsManager.cpp:



Functions

- int main (int argc, char **argv)

4.10.1 Detailed Description

Suite of tests for the AssetsManager class.

A suite of tests for the AssetsManager class.

4.10.2 Function Documentation

4.10.2.1 main()

```
int main (
            int argc,
            char ** argv )
37 {
38     #ifdef _WIN32
39         activateVirtualTerminal();
40     #endif  /* _WIN32 */
41
42     printGold("\tTesting AssetsManager");
43     std::cout « std::endl;
44
45     srand(time(NULL));
46     int n_dots = 8;
47
48
49     try {
50         //  1. construct
51         InputsHandler inputs_handler;
52         AssetsManager assets_manager;
53
54
55         //  2. load/open some test assets
56         assets_manager.loadFont("assets/fonts/DroidSansMono.ttf", "DroidSansMono");
57         assets_manager.loadTexture(
58             "assets/ESC_brand/ESC_key_98x81.png",
59             "ESC_key_98x81"
60         );
61         assets_manager.loadSound("assets/ESC_brand/key_press.ogg", "key_press");
62         assets_manager.loadTrack(
63             "assets/audio/tracks/AlexanderBlu_BackgroundElectronicModernMusic.ogg",
64             "AlexanderBlu_BackgroundElectronicModernMusic"
65         );
66
67
68         //  3. test game loop
69         sf::Clock clock;
70         sf::Event event;
71         sf::RenderWindow window(sf::VideoMode(800, 600), "Testing AssetsManager");
72
73         double screen_width = window.getSize().x;
74         double screen_height = window.getSize().y;
75
76         testFloatEquals(
77             screen_width,
78             800,
79             __FILE__,
80             __LINE__
81         );
82
83         testFloatEquals(
84             screen_height,
85             600,
86             __FILE__,
87             __LINE__
88         );
89
90         unsigned long long int frame = 0;
91         double time_since_run_s = 0;
92
93         assets_manager.playTrack();
94
95         sf::Sprite ESC_key(*(assets_manager.getTexture("ESC_key_98x81")));
96
97         double sprite_width = ESC_key.getLocalBounds().width;
98         double sprite_height = ESC_key.getLocalBounds().height;
99
100         double sprite_velocity_x = 400 * (2 * ((double)rand() / RAND_MAX) - 1);
101         double sprite_velocity_y = 400 * (2 * ((double)rand() / RAND_MAX) - 1);
102
103         ESC_key.setOrigin(sprite_width / 2, sprite_height / 2);
104         ESC_key.setPosition(
105             (screen_width - sprite_width) * ((double)rand() / RAND_MAX) + sprite_width / 2,
106             (screen_height - sprite_height) * ((double)rand() / RAND_MAX) + sprite_height / 2
107         );
108
109         sf::Text click_text(
110             "CLICK!",
111             *(assets_manager.getFont("DroidSansMono")),
112             16
113         );
114
115         double text_width = click_text.getLocalBounds().width;
116         double text_height = click_text.getLocalBounds().height;
```

```
117
118         click_text.setOrigin(text_width / 2, text_height / 2);
119
120         int alpha = 255;
121
122         click_text.setFillColor(sf::Color(255, 255, 255, alpha));
123
124         while (window.isOpen()) {
125             time_since_run_s = clock.getElapsedTime().asSeconds();
126
127             if (
128                 time_since_run_s >= (frame + 1) * SECONDS_PER_FRAME
129             ) {
130                 while (window.pollEvent(event))
131                 {
132                     //...
133
134                     if (event.type == sf::Event::Closed) {
135                         window.close();
136                     }
137                 }
138
139                 ESC_key.move(
140                     sprite_velocity_x * SECONDS_PER_FRAME,
141                     sprite_velocity_y * SECONDS_PER_FRAME
142                 );
143
144                 if (
145                     ESC_key.getPosition().x <= sprite_width / 2 or
146                     ESC_key.getPosition().x >= screen_width - sprite_width / 2
147                 ) {
148                     sprite_velocity_x *= -1;
149
150                     assets_manager.getSound("key_press")->play();
151
152                     alpha = 255;
153                     click_text.setPosition(
154                         ESC_key.getPosition().x,
155                         ESC_key.getPosition().y
156                     );
157                 }
158
159                 if (
160                     ESC_key.getPosition().y <= sprite_height / 2 or
161                     ESC_key.getPosition().y >= screen_height - sprite_height / 2
162                 ) {
163                     sprite_velocity_y *= -1;
164
165                     assets_manager.getSound("key_press")->play();
166
167                     alpha = 255;
168                     click_text.setPosition(
169                         ESC_key.getPosition().x,
170                         ESC_key.getPosition().y
171                     );
172                 }
173
174                 window.clear();
175
176                 window.draw(ESC_key);
177                 window.draw(click_text);
178
179                 window.display();
180
181                 alpha -= 8;
182                 if (alpha < 0) {
183                     alpha = 0;
184                 }
185
186                 click_text.setFillColor(sf::Color(255, 255, 255, alpha));
187
188                 std::cout « frame « " : " « time_since_run_s « "\r" « std::flush;
189                 frame++;
190             }
191         }
192     }
193
194
195     catch (...) {
196         //...
197
198         printGold(" ");
199         for (int i = 0; i < n_dots; i++) {
200             printGold(".");
201         }
202         printGold(" ");
203         printRed("FAIL");
```

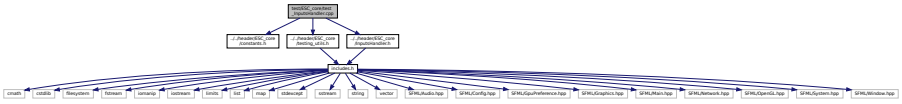
```
204         std::cout « std::endl;
205         throw;
206     }
207
208
209     //...
210
211     printGold(" ");
212     for (int i = 0; i < n_dots; i++) {
213         printGold(".");
214     }
215     printGold(" ");
216     printGreen("PASS");
217     std::cout « std::endl;
218
219     return 0;
220 }   /* main() */
```

4.11 test/ESC_core/test_InputsHandler.cpp File Reference

Suite of tests for the InputsHandler class.

```
#include "../../header/ESC_core/constants.h"
#include "../../header/ESC_core/testing_utils.h"
#include "../../header/ESC_core/InputsHandler.h"
```

Include dependency graph for test_InputsHandler.cpp:



Functions

- int main (int argc, char **argv)

4.11.1 Detailed Description

Suite of tests for the InputsHandler class.

A suite of tests for the InputsHandler class.

4.11.2 Function Documentation

4.11.2.1 main()

```
int main (
              int argc,
              char ** argv )
36 {
37     #ifdef _WIN32
38         activateVirtualTerminal();
39     #endif  /* _WIN32 */
40
41     printGold("\tTesting InputsHandler");
42     std::cout « std::endl;
43
44     srand(time(NULL));
45     int n_dots = 8;
46
47
48     try {
49         //  1. construct and spot check attributes
50         InputsHandler inputs_handler;
51
52         testFloatEquals(
53             int(sf::Keyboard::KeyCount),
54             101,
55             __FILE__,
56             __LINE__
57         );
58
59         testFloatEquals(
60             inputs_handler.key_press_vec.size(),
61             int(sf::Keyboard::KeyCount),
62             __FILE__,
63             __LINE__
64         );
65
66         testFloatEquals(
67             inputs_handler.key_pressed_once_vec.size(),
68             int(sf::Keyboard::KeyCount),
69             __FILE__,
70             __LINE__
71         );
72
73
74         //  2. test game loop
75         sf::Clock clock;
76         sf::Event event;
77         sf::RenderWindow window(sf::VideoMode(800, 600), "Testing InputsHandler");
78
79         unsigned long long int frame = 0;
80         double time_since_run_s = 0;
81
82         while (window.isOpen()) {
83             time_since_run_s = clock.getElapsedTime().asSeconds();
84
85             if (
86                 time_since_run_s >= (frame + 1) * SECONDS_PER_FRAME
87             ) {
88                 while (window.pollEvent(event))
89                 {
90                     inputs_handler.process(&event);
91
92                     if (event.type == sf::Event::Closed) {
93                         window.close();
94                     }
95                 }
96
97                 window.clear();
98                 window.display();
99
100                 inputs_handler.printKeysPressed();
101                 if (inputs_handler.key_pressed_once_vec[sf::Keyboard::Enter]) {
102                     std::cout « "Enter" « std::endl;
103                 }
104
105                 inputs_handler.reset();
106
107                 std::cout « frame « " : " « time_since_run_s « "\r" « std::flush;
108                 frame++;
109             }
110         }
111     }
112
113
114     catch (...) {
115         //...
```

```
116
117         printGold(" ");
118         for (int i = 0; i < n_dots; i++) {
119             printGold(".");
120         }
121         printGold(" ");
122         printRed("FAIL");
123         std::cout « std::endl;
124         throw;
125     }
126
127
128     //...
129
130     printGold(" ");
131     for (int i = 0; i < n_dots; i++) {
132         printGold(".");
133     }
134     printGold(" ");
135     printGreen("PASS");
136     std::cout « std::endl;
137
138     return 0;
139 }   /* main() */
```

Bibliography

L. Gomila. SFML: Simple and Fast Multimedia Library, 2023. URL https://www.sfml-dev.org/. 28

D. van Heesch. Doxygen: Generate documentation from source code, 2023. URL https://www.doxygen.nl. 27

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