HelloWorld

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Chapter 1

Class Index

1.1 Class List

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Chapter 2

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2.1 File List

Here is a list of all files with brief descriptions:

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.

Public 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).

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.

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.

```
739 {
740     this->clear();
741
742     std::cout « "AssetsManager at " « this « " destroyed" « std::endl;
743
744     return;
745 }   /* ~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         sound_iter->second->stop();
700         delete sound_iter->second;
701
702         std::cout « "Sound " « sound_iter->first « " deleted from sound map" «
703             std::endl;
704     }
705     this->sound_map.clear();
706
```

```
707
708     //  5. clear tracks
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         track_iter->second->stop();
716         delete track_iter->second;
717
718         std::cout « "Track " « track_iter->first « " deleted from track map" «
719             std::endl;
720     }
721     this->track_map.clear();
722
723     return;
724 }   /* 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
```

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
```

A map of pointers to loaded fonts.

3.1.4.3 sound_map

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

A map of pointers to loaded sounds.

3.1.4.4 soundbuffer_map

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

A map of pointers to sound buffers.

3.1.4.5 texture_map

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

A map of pointers to loaded textures.

3.1.4.6 track_map

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

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

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

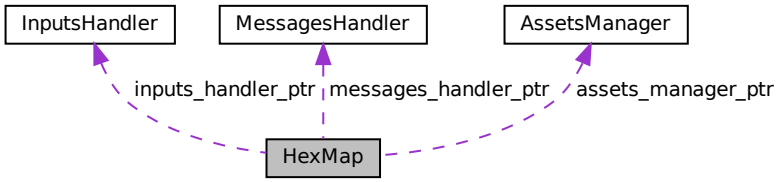
- header/ESC_core/AssetsManager.h
- source/ESC_core/AssetsManager.cpp

3.2 HexMap Class Reference

A class which defines a hex map of hex tiles.

```
#include <HexMap.h>
```

Collaboration diagram for HexMap:



Public Member Functions

- HexMap (int, AssetsManager ∗, InputsHandler ∗, MessagesHandler ∗, sf::RenderWindow ∗)
  Constructor for the HexMap class.
- void assess (void)
  Method to assess the resource of the selected tile.
- void process (void)
  Method to process HexMap. To be called once per frame;.
- void reroll (void)
  Method to re-roll the hex map.
- void toggleResourceOverlay (void)
  Method to toggle the hex map resource overlay.
- void draw (void)
  Method to draw the hex map to the render window. To be called only once per frame!
- void clear (void)
  Method to clear the hex map.
- ∼HexMap (void)
  Destructor for the HexMap class.

Public Attributes

- int n_layers

  The number of layers in the hex map.
- int n_tiles

  The number of tiles in the hex map.
- int frame

  The current frame of this object.
- double position_x

  The x position of the hex map's origin (i.e. central) tile.
- double position_y

  The y position of the hex map's origin (i.e. central) tile.
- std::vector< double > tile_position_x_vec

  A vector of tile x positions.
- std::vector< double > tile_position_y_vec

  A vector of tile y position.
- std::vector< HexTile * > border_tiles_vec

  A vector of pointers to the border tiles.
- std::map< double, std::map< double, HexTile * > > hex_map

  A position-indexed, nested map of hex tiles.

Private Member Functions

- void __layTiles (void)

  Helper method to lay the hex tiles down to generate the game world.
- std::vector< double > __getNoise (int, int=128)

  Helper method to generate a vector of noise, with values mapped to the closed interval [0, 1]. Applies a random cosine series approach.
- void __procedurallyGenerateTileTypes (void)

  Helper method to procedurally generate tile types and set tiles accordingly.
- std::vector< double > __getValidMapIndexPositions (double, double)

  Helper method to translate given position into valid index position for a.
- std::vector< HexTile * > __getNeighboursVector (HexTile *)

  Helper method to assemble a vector pointers to all neighbours of the given tile.
- TileType __getMajorityTileType (HexTile *)

  Function to return majority tile type of a tile and its neighbours. If no clear majority, simply returns the type of the given tile.
- void __smoothTileTypes (void)

  Helper method to smooth tile types using a majority rules approach.
- bool __isLakeTouchingOcean (HexTile *)
- void __enforceOceanContinuity (void)

  Helper method to scan tiles and enforce ocean continuity. That is to say, if a lake tile is found to be in contact with an ocean tile, then it becomes ocean.
- void __procedurallyGenerateTileResources (void)

  Helper method to procedurally generate tile resources and set tiles accordingly.
- void __assembleHexMap (void)

  Helper method to assemble the hex map.
- HexTile * __getSelectedTile (void)

  Helper method to get pointer to selected tile.

Private Attributes

- AssetsManager * assets_manager_ptr

  A pointer to the assets manager.
- InputsHandler * inputs_handler_ptr

  A pointer to the inputs handler.
- MessagesHandler * messages_handler_ptr

  A pointer to the messages handler.
- sf::RenderWindow * render_window_ptr

  A pointer to the render window.

3.2.1 Detailed Description

A class which defines a hex map of hex tiles.

3.2.2 Constructor & Destructor Documentation

3.2.2.1 HexMap()

```
HexMap::HexMap (
            int n_layers,
            AssetsManager * assets_manager_ptr,
            InputsHandler * inputs_handler_ptr,
            MessagesHandler * messages_handler_ptr,
            sf::RenderWindow * render_window_ptr )
```

Constructor for the HexMap class.

Parameters

n_layers	The number of layers in the HexMap.
assets_manager_ptr	Pointer to the assets manager.
inputs_handler_ptr	Pointer to the inputs handler.
messages_handler_ptr	Pointer to the messages handler.
render_window_ptr	Pointer to the render window.

```
847 {
848     //  1. set attributes
849     this->assets_manager_ptr = assets_manager_ptr;
850     this->inputs_handler_ptr = inputs_handler_ptr;
851     this->messages_handler_ptr = messages_handler_ptr;
852     this->render_window_ptr = render_window_ptr;
853 
854     this->frame = 0;
855 
856     this->n_layers = n_layers;
857     if (this->n_layers < 0) {
858         this->n_layers = 0;
859     }
860 
861     this->position_x = 400;
862     this->position_y = 400;
863 
864     //  2. assemble n layer hex map
```

```
865     this->__assembleHexMap();
866
867     std::cout « "HexMap constructed at " « this « std::endl;
868
869     return;
870 }   /* HexMap() */
```

3.2.2.2 ~HexMap()

```
HexMap::~HexMap (
            void  )
```

Destructor for the HexMap class.

```
1076 {
1077     this->clear();
1078
1079     std::cout « "HexMap at " « this « " destroyed" « std::endl;
1080
1081     return;
1082 }   /* ~HexMap() */
```

3.2.3 Member Function Documentation

3.2.3.1 __assembleHexMap()

```
void HexMap::__assembleHexMap (
            void  )  [private]
```

Helper method to assemble the hex map.

```
738 {
739     //  1. seed RNG (using milliseconds since 1 Jan 1970)
740     unsigned long long int milliseconds_since_epoch =
741         std::chrono::duration_cast<std::chrono::milliseconds>(
742             std::chrono::system_clock::now().time_since_epoch()
743         ).count();
744     srand(milliseconds_since_epoch);
745
746     //  2. lay tiles
747     this->__layTiles();
748
749     //  3. procedurally generate types
750     this->__procedurallyGenerateTileTypes();
751
752     //  4. procedurally generate resources
753     this->__procedurallyGenerateTileResources();
754
755     return;
756 }   /* __assembleHexMap() */
```

3.2.3.2 __enforceOceanContinuity()

```
void HexMap::__enforceOceanContinuity (
            void  )  [private]
```

Helper method to scan tiles and enforce ocean continuity. That is to say, if a lake tile is found to be in contact with an ocean tile, then it becomes ocean.

```
649 {
650     std::cout « "enforcing ocean continuity ..." « std::endl;
651 
652     bool tile_changed = false;
653 
654     //  1. scan tiles and enforce (where appropriate)
655     std::map<double, std::map<double, HexTile*»::iterator hex_map_iter_x;
656     std::map<double, HexTile*>::iterator hex_map_iter_y;
657     HexTile* hex_ptr;
658     for (
659         hex_map_iter_x = this->hex_map.begin();
660         hex_map_iter_x != this->hex_map.end();
661         hex_map_iter_x++
662     ) {
663         for (
664             hex_map_iter_y = hex_map_iter_x->second.begin();
665             hex_map_iter_y != hex_map_iter_x->second.end();
666             hex_map_iter_y++
667         ) {
668             hex_ptr = hex_map_iter_y->second;
669 
670             if (this->__isLakeTouchingOcean(hex_ptr)) {
671                 hex_ptr->setTileType(TileType :: OCEAN);
672                 tile_changed = true;
673             }
674         }
675     }
676 
677     if (tile_changed) {
678         this->__enforceOceanContinuity();
679     }
680     else {
681         return;
682     }
683 }   /* __enforceOceanContinuity() */
```

3.2.3.3 __getMajorityTileType()

```
TileType HexMap::__getMajorityTileType (
             HexTile * hex_ptr )  [private]
```

Function to return majority tile type of a tile and its neighbours. If no clear majority, simply returns the type of the given tile.

Parameters

hex_ptr	Pointer to the given tile.

Returns

The majority tile type of the tile and its neighbours. If no clear majority type, then the type of the given tile is simply returned.

```
505 {
506     //  1. init type count map
507     std::map<TileType, int> type_count_map;
508     type_count_map[hex_ptr->tile_type] = 1;
509 
510     //  2. survey neighbours, count type instances
```

```
511     std::vector<HexTile*> neighbours_vec = this->__getNeighboursVector(hex_ptr);
512
513     for (size_t i = 0; i < neighbours_vec.size(); i++) {
514         if (type_count_map.count(neighbours_vec[i]->tile_type) <= 0) {
515             type_count_map[neighbours_vec[i]->tile_type] = 1;
516         }
517         else {
518             type_count_map[neighbours_vec[i]->tile_type] += 1;
519         }
520     }
521
522     //  3. find majority tile type
523     int max_count = -1 * std::numeric_limits<int>::infinity();
524     TileType majority_tile_type = hex_ptr->tile_type;
525
526     std::map<TileType, int>::iterator map_iter;
527     for (
528         map_iter = type_count_map.begin();
529         map_iter != type_count_map.end();
530         map_iter++
531     ){
532         if (map_iter->second > max_count) {
533             max_count = map_iter->second;
534             majority_tile_type = map_iter->first;
535         }
536     }
537
538     //  4. detect ties
539     for (
540         map_iter = type_count_map.begin();
541         map_iter != type_count_map.end();
542         map_iter++
543     ){
544         if (
545             map_iter->second == max_count and
546             map_iter->first != majority_tile_type
547         ) {
548             majority_tile_type = hex_ptr->tile_type;
549             break;
550         }
551     }
552
553     return majority_tile_type;
554 }   /* __getMajorityTileType() */
```

3.2.3.4 __getNeighboursVector()

```
std::vector< HexTile * > HexMap::__getNeighboursVector (
            HexTile * hex_ptr )  [private]
```

Helper method to assemble a vector pointers to all neighbours of the given tile.

Parameters

hex_ptr	A pointer to the given tile.

Returns

A vector of pointers to all neighbours of the given tile.

```
447 {
448     std::vector<HexTile*> neighbours_vec;
449
450     //  1. build potential neighbour positions
451     std::vector<double> potential_neighbour_x_vec(6, 0);
452     std::vector<double> potential_neighbour_y_vec(6, 0);
453
454     for (int i = 0; i < 6; i++) {
455         potential_neighbour_x_vec[i] = hex_ptr->position_x +
456             2 * hex_ptr->minor_radius * cos((60 * i) * (M_PI / 180));
457
458         potential_neighbour_y_vec[i] = hex_ptr->position_y +
```

```
459             2 * hex_ptr->minor_radius * sin((60 * i) * (M_PI / 180));
460     }
461
462     //  2. populate neighbours vector
463     std::vector<double> map_index_positions;
464     double potential_x = 0;
465     double potential_y = 0;
466
467     for (int i = 0; i < 6; i++) {
468         potential_x = potential_neighbour_x_vec[i];
469         potential_y = potential_neighbour_y_vec[i];
470
471         map_index_positions = this->__getValidMapIndexPositions(
472             potential_x,
473             potential_y
474         );
475
476         if (not (map_index_positions[0] == -1)) {
477             neighbours_vec.push_back(
478                 this->hex_map[map_index_positions[0]][map_index_positions[1]]
479             );
480         }
481     }
482
483     return neighbours_vec;
484 }   /* __getNeighbourVector() */
```

3.2.3.5 __getNoise()

```
std::vector< double > HexMap::__getNoise (
            int n_elements,
            int n_components = 128 )  [private]
```

Helper method to generate a vector of noise, with values mapped to the closed interval [0, 1]. Applies a random cosine series approach.

Parameters

n_elements	The number of elements in the generated noise vector.
n_components	The number of components to use in the random cosine series. Defaults to 64.

Returns

A vector of noise, with values mapped to the closed interval [0, 1].

```
227 {
228     //  1. generate random amplitude, wave number, direction, and phase vectors
229     std::vector<double> random_amplitude_vec(n_components, 0);
230     std::vector<double> random_wave_number_vec(n_components, 0);
231     std::vector<double> random_frequency_vec(n_components, 0);
232     std::vector<double> random_direction_vec(n_components, 0);
233     std::vector<double> random_phase_vec(n_components, 0);
234
235     for (int i = 0; i < n_components; i++) {
236         random_amplitude_vec[i] = 10 * ((double)rand() / RAND_MAX);
237
238         random_wave_number_vec[i] = 2 * M_PI * ((double)rand() / RAND_MAX);
239
240         random_frequency_vec[i] = ((double)rand() / RAND_MAX);
241
242         random_direction_vec[i] = 2 * M_PI * ((double)rand() / RAND_MAX);
243
244         random_phase_vec[i] = 2 * M_PI * ((double)rand() / RAND_MAX);
245     }
246
247     //  2. generate noise vec
248     double amp = 0;
249     double wave_no = 0;
250     double freq = 0;
251     double dir = 0;
```

```
252     double phase = 0;
253
254     double x = 0;
255     double y = 0;
256     double t = time(NULL);
257
258     double max_noise = -1 * std::numeric_limits<double>::infinity();
259     double min_noise = std::numeric_limits<double>::infinity();
260
261     double noise = 0;
262     std::vector<double> noise_vec(n_elements, 0);
263
264     for (int i = 0; i < n_elements; i++) {
265         x = this->tile_position_x_vec[i] - this->position_x;
266         y = this->tile_position_y_vec[i] - this->position_y;
267
268         for (int j = 0; j < n_components; j++) {
269             amp = random_amplitude_vec[j];
270             wave_no = random_wave_number_vec[j];
271             freq = random_frequency_vec[j];
272             dir = random_direction_vec[j];
273             phase = random_phase_vec[j];
274
275             noise += (amp / (j + 1)) * cos(
276                 wave_no * (j + 1) * (x * sin(dir) + y * cos(dir)) +
277                 2 * M_PI * (j + 1) * freq * t +
278                 phase
279             );
280         }
281
282         noise_vec[i] = noise;
283
284         if (noise > max_noise) {
285             max_noise = noise;
286         }
287
288         else if (noise < min_noise) {
289             min_noise = noise;
290         }
291
292         noise = 0;
293     }
294
295     //  3. normalize noise vec
296     for (int i = 0; i < n_elements; i++) {
297         noise_vec[i] = (noise_vec[i] - min_noise) / (max_noise - min_noise);
298
299         if (noise_vec[i] < 0) {
300             noise_vec[i] = 0;
301         }
302         else if (noise_vec[i] > 1) {
303             noise_vec[i] = 1;
304         }
305     }
306
307     return noise_vec;
308 }   /* __getNoise() */
```

3.2.3.6 __getSelectedTile()

```
HexTile * HexMap::__getSelectedTile (
            void  )  [private]
```

Helper method to get pointer to selected tile.

Returns

Pointer to selected tile (or NULL if no tile selected).

```
773 {
774     HexTile* selected_tile_ptr = NULL;
775
776     bool break_flag = false;
777     std::map<double, std::map<double, HexTile*>::iterator hex_map_iter_x;
778     std::map<double, HexTile*>::iterator hex_map_iter_y;
779
```

```
780     for (
781         hex_map_iter_x = this->hex_map.begin();
782         hex_map_iter_x != this->hex_map.end();
783         hex_map_iter_x++
784     ) {
785         for (
786             hex_map_iter_y = hex_map_iter_x->second.begin();
787             hex_map_iter_y != hex_map_iter_x->second.end();
788             hex_map_iter_y++
789         ) {
790             if (hex_map_iter_y->second->is_selected) {
791                 selected_tile_ptr = hex_map_iter_y->second;
792                 break_flag = true;
793             }
794
795             if (break_flag) {
796                 break;
797             }
798         }
799
800         if (break_flag) {
801             break;
802         }
803     }
804
805     return selected_tile_ptr;
806 }   /* __getSelectedTile() */
```

3.2.3.7 __getValidMapIndexPositions()

```
std::vector< double > HexMap::__getValidMapIndexPositions (
            double potential_x,
            double potential_y )  [private]
```

Helper method to translate given position into valid index position for a.

Parameters

potential_x	The potential x position of the tile.
potential_y	The potential y position of the tile.

Returns

A vector of positions, either valid for indexing into the hex map, or sentinel values (-1) if invalid.

```
393 {
394     std::vector<double> map_index_positions = {-1, -1};
395
396     std::map<double, std::map<double, HexTile*>>::iterator hex_map_iter_x;
397     std::map<double, HexTile*>::iterator hex_map_iter_y;
398     HexTile* hex_ptr;
399
400     double distance = 0;
401
402     for (
403         hex_map_iter_x = this->hex_map.begin();
404         hex_map_iter_x != this->hex_map.end();
405         hex_map_iter_x++
406     ) {
407         for (
408             hex_map_iter_y = hex_map_iter_x->second.begin();
409             hex_map_iter_y != hex_map_iter_x->second.end();
410             hex_map_iter_y++
411         ) {
412             hex_ptr = hex_map_iter_y->second;
413
414             distance = sqrt(
```

```
415                 pow(hex_ptr->position_x - potential_x, 2) +
416                 pow(hex_ptr->position_y - potential_y, 2)
417             );
418
419             if (distance <= hex_ptr->minor_radius / 4) {
420                 map_index_positions = {hex_ptr->position_x, hex_ptr->position_y};
421                 return map_index_positions;
422             }
423         }
424     }
425
426     return map_index_positions;
427 }   /* __isInHexMap() */
```

3.2.3.8 __isLakeTouchingOcean()

```
bool HexMap::__isLakeTouchingOcean (
            HexTile * hex_ptr )  [private]
616 {
617     //  1. if not lake tile, return
618     if (not (hex_ptr->tile_type == TileType :: LAKE)) {
619         return false;
620     }
621
622     //  2. scan neighbours for ocean tiles
623     std::vector<HexTile*> neighbours_vec = this->__getNeighboursVector(hex_ptr);
624
625     for (size_t i = 0; i < neighbours_vec.size(); i++) {
626         if (neighbours_vec[i]->tile_type == TileType :: OCEAN) {
627             return true;
628         }
629     }
630
631     return false;
632 }   /* __isLakeTouchingOcean() */
```

3.2.3.9 __layTiles()

```
void HexMap::__layTiles (
            void  )  [private]
```

Helper method to lay the hex tiles down to generate the game world.

```
34 {
35     this->n_tiles = 0;
36
37     //  1. add origin tile
38     HexTile* hex_ptr = new HexTile(
39         this->position_x,
40         this->position_y,
41         this->assets_manager_ptr,
42         this->inputs_handler_ptr,
43         this->messages_handler_ptr,
44         this->render_window_ptr
45     );
46
47     this->hex_map[hex_ptr->position_x][hex_ptr->position_y] = hex_ptr;
48     this->tile_position_x_vec.push_back(hex_ptr->position_x);
49     this->tile_position_y_vec.push_back(hex_ptr->position_y);
50     this->n_tiles++;
51
52
53     //  2. fill out first row (reflect across origin tile)
54     for (int i = 0; i < this->n_layers; i++) {
55         hex_ptr = new HexTile(
56             this->position_x + 2 * (i + 1) * hex_ptr->minor_radius,
57             this->position_y,
58             this->assets_manager_ptr,
59             this->inputs_handler_ptr,
60             this->messages_handler_ptr,
61             this->render_window_ptr
```

```
62          );
63
64          this->hex_map[hex_ptr->position_x][hex_ptr->position_y] = hex_ptr;
65          this->tile_position_x_vec.push_back(hex_ptr->position_x);
66          this->tile_position_y_vec.push_back(hex_ptr->position_y);
67          this->n_tiles++;
68
69          if (i == this->n_layers - 1) {
70              this->border_tiles_vec.push_back(hex_ptr);
71          }
72
73          hex_ptr = new HexTile(
74              this->position_x - 2 * (i + 1) * hex_ptr->minor_radius,
75              this->position_y,
76              this->assets_manager_ptr,
77              this->inputs_handler_ptr,
78              this->messages_handler_ptr,
79              this->render_window_ptr
80          );
81
82          this->hex_map[hex_ptr->position_x][hex_ptr->position_y] = hex_ptr;
83          this->tile_position_x_vec.push_back(hex_ptr->position_x);
84          this->tile_position_y_vec.push_back(hex_ptr->position_y);
85          this->n_tiles++;
86
87          if (i == this->n_layers - 1) {
88              this->border_tiles_vec.push_back(hex_ptr);
89          }
90      }
91
92
93      //  3. fill out subsequent rows (reflect across first row)
94      HexTile* first_row_left_tile = hex_ptr;
95
96      int offset_count = 1;
97
98      double x_offset = 0;
99      double y_offset = 0;
100
101      for (
102          int row_width = 2 * this->n_layers;
103          row_width > this->n_layers;
104          row_width--
105      ) {
106          //  3.1. upper row
107          x_offset = first_row_left_tile->position_x +
108              2 * offset_count * first_row_left_tile->minor_radius *
109              cos(60 * (M_PI / 180));
110
111          y_offset = first_row_left_tile->position_y -
112              2 * offset_count * first_row_left_tile->minor_radius *
113              sin(60 * (M_PI / 180));
114
115          hex_ptr = new HexTile(
116              x_offset,
117              y_offset,
118              this->assets_manager_ptr,
119              this->inputs_handler_ptr,
120              this->messages_handler_ptr,
121              this->render_window_ptr
122          );
123
124          this->hex_map[hex_ptr->position_x][hex_ptr->position_y] = hex_ptr;
125          this->tile_position_x_vec.push_back(hex_ptr->position_x);
126          this->tile_position_y_vec.push_back(hex_ptr->position_y);
127          this->n_tiles++;
128
129          this->border_tiles_vec.push_back(hex_ptr);
130
131          for (int i = 1; i < row_width; i++) {
132              x_offset += 2 * first_row_left_tile->minor_radius;
133
134              hex_ptr = new HexTile(
135                  x_offset,
136                  y_offset,
137                  this->assets_manager_ptr,
138                  this->inputs_handler_ptr,
139                  this->messages_handler_ptr,
140                  this->render_window_ptr
141              );
142
143              this->hex_map[hex_ptr->position_x][hex_ptr->position_y] = hex_ptr;
144              this->tile_position_x_vec.push_back(hex_ptr->position_x);
145              this->tile_position_y_vec.push_back(hex_ptr->position_y);
146              this->n_tiles++;
147
148              if (row_width == this->n_layers + 1 or i == row_width - 1) {
```

```
149                 this->border_tiles_vec.push_back(hex_ptr);
150             }
151         }
152 
153         //  3.2. lower row
154         x_offset = first_row_left_tile->position_x +
155             2 * offset_count * first_row_left_tile->minor_radius *
156             cos(60 * (M_PI / 180));
157 
158         y_offset = first_row_left_tile->position_y +
159             2 * offset_count * first_row_left_tile->minor_radius *
160             sin(60 * (M_PI / 180));
161 
162         hex_ptr = new HexTile(
163             x_offset,
164             y_offset,
165             this->assets_manager_ptr,
166             this->inputs_handler_ptr,
167             this->messages_handler_ptr,
168             this->render_window_ptr
169         );
170 
171         this->hex_map[hex_ptr->position_x][hex_ptr->position_y] = hex_ptr;
172         this->tile_position_x_vec.push_back(hex_ptr->position_x);
173         this->tile_position_y_vec.push_back(hex_ptr->position_y);
174         this->n_tiles++;
175 
176         this->border_tiles_vec.push_back(hex_ptr);
177 
178         for (int i = 1; i < row_width; i++) {
179             x_offset += 2 * first_row_left_tile->minor_radius;
180 
181             hex_ptr = new HexTile(
182                 x_offset,
183                 y_offset,
184                 this->assets_manager_ptr,
185                 this->inputs_handler_ptr,
186                 this->messages_handler_ptr,
187                 this->render_window_ptr
188             );
189 
190             this->hex_map[hex_ptr->position_x][hex_ptr->position_y] = hex_ptr;
191             this->tile_position_x_vec.push_back(hex_ptr->position_x);
192             this->tile_position_y_vec.push_back(hex_ptr->position_y);
193             this->n_tiles++;
194 
195             if (row_width == this->n_layers + 1 or i == row_width - 1) {
196                 this->border_tiles_vec.push_back(hex_ptr);
197             }
198         }
199 
200         offset_count++;
201     }
202 
203     return;
204 }   /* __layTiles() */
```

3.2.3.10 __procedurallyGenerateTileResources()

```
void HexMap::__procedurallyGenerateTileResources (
            void  )  [private]
```

Helper method to procedurally generate tile resources and set tiles accordingly.

```
698 {
699     //  1. get random cosine series noise vec
700     std::vector<double> noise_vec = this->__getNoise(this->n_tiles);
701 
702     //  2. set tile resources based on random cosine series noise
703     int noise_idx = 0;
704 
705     std::map<double, std::map<double, HexTile*>::iterator hex_map_iter_x;
706     std::map<double, HexTile*>::iterator hex_map_iter_y;
707     for (
708         hex_map_iter_x = this->hex_map.begin();
709         hex_map_iter_x != this->hex_map.end();
710         hex_map_iter_x++
711     ) {
712         for (
```

```
713             hex_map_iter_y = hex_map_iter_x->second.begin();
714             hex_map_iter_y != hex_map_iter_x->second.end();
715             hex_map_iter_y++
716         ) {
717             hex_map_iter_y->second->setTileResource(noise_vec[noise_idx]);
718             noise_idx++;
719         }
720     }
721
722     return;
723 }   /* __procedurallyGenerateTileResources() */
```

3.2.3.11 __procedurallyGenerateTileTypes()

```
void HexMap::__procedurallyGenerateTileTypes (
            void  )  [private]
```

Helper method to procedurally generate tile types and set tiles accordingly.

```
323 {
324     //  1. get random cosine series noise vec
325     std::vector<double> noise_vec = this->__getNoise(this->n_tiles);
326
327     //  2. set initial tile types based on either random cosine series noise or white
328     //     noise (decided by coin toss)
329     int noise_idx = 0;
330
331     std::map<double, std::map<double, HexTile*>::iterator hex_map_iter_x;
332     std::map<double, HexTile*>::iterator hex_map_iter_y;
333     for (
334         hex_map_iter_x = this->hex_map.begin();
335         hex_map_iter_x != this->hex_map.end();
336         hex_map_iter_x++
337     ) {
338         for (
339             hex_map_iter_y = hex_map_iter_x->second.begin();
340             hex_map_iter_y != hex_map_iter_x->second.end();
341             hex_map_iter_y++
342         ) {
343             if ((double)rand() / RAND_MAX > 0.5) {
344                 hex_map_iter_y->second->setTileType(noise_vec[noise_idx]);
345             }
346             else {
347                 hex_map_iter_y->second->setTileType((double)rand() / RAND_MAX);
348             }
349             noise_idx++;
350         }
351     }
352
353     //  3. smooth tile types (majority rules)
354     this->__smoothTileTypes();
355
356     //  4. set border tile type to ocean
357     for (size_t i = 0; i < this->border_tiles_vec.size(); i++) {
358         this->border_tiles_vec[i]->setTileType(TileType :: OCEAN);
359     }
360
361     //  5. enforce ocean continuity (i.e. all lake tiles touching ocean become ocean)
362     this->__enforceOceanContinuity();
363
364     return;
365 }   /* __procedurallyGenerateTileTypes() */
```

3.2.3.12 __smoothTileTypes()

```
void HexMap::__smoothTileTypes (
            void  )  [private]
```

Helper method to smooth tile types using a majority rules approach.

```
569 {
```

```
570     std::cout « "smoothing ..." « std::endl;
571
572     std::map<double, std::map<double, HexTile*»::iterator hex_map_iter_x;
573     std::map<double, HexTile*>::iterator hex_map_iter_y;
574     HexTile* hex_ptr;
575     TileType majority_tile_type;
576
577     for (
578         hex_map_iter_x = this->hex_map.begin();
579         hex_map_iter_x != this->hex_map.end();
580         hex_map_iter_x++
581     ) {
582         for (
583             hex_map_iter_y = hex_map_iter_x->second.begin();
584             hex_map_iter_y != hex_map_iter_x->second.end();
585             hex_map_iter_y++
586         ) {
587             hex_ptr = hex_map_iter_y->second;
588             majority_tile_type = this->__getMajorityTileType(hex_ptr);
589
590             if (majority_tile_type != hex_ptr->tile_type) {
591                 hex_ptr->setTileType(majority_tile_type);
592             }
593         }
594     }
595
596     return;
597 }   /* __smoothTileTypes() */
```

3.2.3.13 assess()

```
void HexMap::assess (
              void  )
```

Method to assess the resource of the selected tile.

```
885 {
886     HexTile* selected_tile_ptr = this->__getSelectedTile();
887     if (selected_tile_ptr != NULL) {
888         selected_tile_ptr->assess();
889     }
890
891     return;
892 }   /* assess() */
```

3.2.3.14 clear()

```
void HexMap::clear (
              void  )
```

Method to clear the hex map.

```
1038 {
1039     std::map<double, std::map<double, HexTile*»::iterator hex_map_iter_x;
1040     std::map<double, HexTile*>::iterator hex_map_iter_y;
1041     for (
1042         hex_map_iter_x = this->hex_map.begin();
1043         hex_map_iter_x != this->hex_map.end();
1044         hex_map_iter_x++
1045     ) {
1046         for (
1047             hex_map_iter_y = hex_map_iter_x->second.begin();
1048             hex_map_iter_y != hex_map_iter_x->second.end();
1049             hex_map_iter_y++
1050         ) {
1051             delete hex_map_iter_y->second;
1052         }
1053     }
1054     this->hex_map.clear();
1055
1056     this->tile_position_x_vec.clear();
1057     this->tile_position_y_vec.clear();
1058     this->border_tiles_vec.clear();
1059
1060     return;
1061 }   /* clear() */
```

3.2.3.15 draw()

```
void HexMap::draw (
            void  )
```

Method to draw the hex map to the render window. To be called only once per frame!

```
997 {
998     //  1. draw all tiles in order
999     std::map<double, std::map<double, HexTile*>::iterator hex_map_iter_x;
1000     std::map<double, HexTile*>::iterator hex_map_iter_y;
1001     for (
1002         hex_map_iter_x = this->hex_map.begin();
1003         hex_map_iter_x != this->hex_map.end();
1004         hex_map_iter_x++
1005     ) {
1006         for (
1007             hex_map_iter_y = hex_map_iter_x->second.begin();
1008             hex_map_iter_y != hex_map_iter_x->second.end();
1009             hex_map_iter_y++
1010         ) {
1011             hex_map_iter_y->second->draw();
1012         }
1013     }
1014
1015     //  2. redraw selected tile on top
1016     HexTile* selected_tile_ptr = this->__getSelectedTile();
1017     if (selected_tile_ptr != NULL) {
1018         selected_tile_ptr->draw();
1019     }
1020
1021     this->frame++;
1022     return;
1023 }   /* draw() */
```

3.2.3.16 process()

```
void HexMap::process (
            void  )
```

Method to process HexMap. To be called once per frame;.

```
907 {
908     //  1. handle inputs
909     //...
910
911     //  2. process tiles
912     std::map<double, std::map<double, HexTile*>::iterator hex_map_iter_x;
913     std::map<double, HexTile*>::iterator hex_map_iter_y;
914     for (
915         hex_map_iter_x = this->hex_map.begin();
916         hex_map_iter_x != this->hex_map.end();
917         hex_map_iter_x++
918     ) {
919         for (
920             hex_map_iter_y = hex_map_iter_x->second.begin();
921             hex_map_iter_y != hex_map_iter_x->second.end();
922             hex_map_iter_y++
923         ) {
924             hex_map_iter_y->second->process();
925         }
926     }
927
928     return;
929 }   /* process() */
```

3.2.3.17 reroll()

```
void HexMap::reroll (
            void  )
```

Method to re-roll the hex map.

```
944 {
945     this->clear();
946     this->__assembleHexMap();
947 
948     return;
949 }   /* reroll() */
```

3.2.3.18 toggleResourceOverlay()

```
void HexMap::toggleResourceOverlay (
            void  )
```

Method to toggle the hex map resource overlay.

```
964 {
965     std::map<double, std::map<double, HexTile*>::iterator hex_map_iter_x;
966     std::map<double, HexTile*>::iterator hex_map_iter_y;
967     for (
968         hex_map_iter_x = this->hex_map.begin();
969         hex_map_iter_x != this->hex_map.end();
970         hex_map_iter_x++
971     ) {
972         for (
973             hex_map_iter_y = hex_map_iter_x->second.begin();
974             hex_map_iter_y != hex_map_iter_x->second.end();
975             hex_map_iter_y++
976         ) {
977             hex_map_iter_y->second->toggleResourceOverlay();
978         }
979     }
980 
981     return;
982 }   /* toggleResourceOverlay() */
```

3.2.4 Member Data Documentation

3.2.4.1 assets_manager_ptr

```
AssetsManager* HexMap::assets_manager_ptr  [private]
```

A pointer to the assets manager.

3.2.4.2 border_tiles_vec

```
std::vector<HexTile*> HexMap::border_tiles_vec
```

A vector of pointers to the border tiles.

3.2.4.3 frame

```
int HexMap::frame
```

The current frame of this object.

3.2.4.4 hex_map

```
std::map<double, std::map<double, HexTile*> > HexMap::hex_map
```

A position-indexed, nested map of hex tiles.

3.2.4.5 inputs_handler_ptr

```
InputsHandler* HexMap::inputs_handler_ptr  [private]
```

A pointer to the inputs handler.

3.2.4.6 messages_handler_ptr

```
MessagesHandler* HexMap::messages_handler_ptr  [private]
```

A pointer to the messages handler.

3.2.4.7 n_layers

```
int HexMap::n_layers
```

The number of layers in the hex map.

3.2.4.8 n_tiles

```
int HexMap::n_tiles
```

The number of tiles in the hex map.

3.2.4.9 position_x

```
double HexMap::position_x
```

The x position of the hex map's origin (i.e. central) tile.

3.2.4.10 position_y

```
double HexMap::position_y
```

The y position of the hex map's origin (i.e. central) tile.

3.2.4.11 render_window_ptr

```
sf::RenderWindow* HexMap::render_window_ptr  [private]
```

A pointer to the render window.

3.2.4.12 tile_position_x_vec

```
std::vector<double> HexMap::tile_position_x_vec
```

A vector of tile x positions.

3.2.4.13 tile_position_y_vec

```
std::vector<double> HexMap::tile_position_y_vec
```

A vector of tile y position.

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

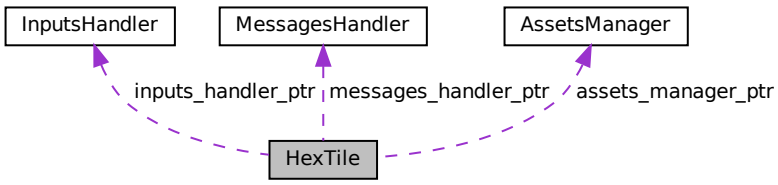
- header/HexMap/HexMap.h
- source/HexMap/HexMap.cpp

3.3 HexTile Class Reference

A class which defines a hex tile of the hex map.

`#include <HexTile.h>`

Collaboration diagram for HexTile:



Public Member Functions

- HexTile (double, double, AssetsManager ∗, InputsHandler ∗, MessagesHandler ∗, sf::RenderWindow ∗)

  Constructor for the HexTile class.
- void setTileType (TileType)

  Method to set the tile type (by enum value).
- void setTileType (double)

  Method to set the tile type (by numeric input).
- void setTileResource (TileResource)

  Method to set the tile resource (by enum value).
- void setTileResource (double)

  Method to set the tile resource (by numeric input).
- void toggleResourceOverlay (void)

  Method to toggle the tile resource overlay.
- void assess (void)

  Method to assess the tile's resource.
- void process (void)

  Method to process HexTile. To be called once per frame.
- void draw (void)

  Method to draw the hex tile to the render window. To be called only once per frame!
- ∼HexTile (void)

  Destructor for the HexTile class.

Public Attributes

- TileType tile_type
- TileResource tile_resource
- bool show_node

  A boolean which indicates whether or not to show the tile node.
- bool show_resource

  A boolean which indicates whether or not to show resource value.

- bool resource_assessed

  A boolean which indicates whether or not the resource has been assessed.
- bool is_selected

  A boolean which indicates whether or not the tile is selected.
- int frame

  The current frame of this object.
- double position_x

  The x position of the tile.
- double position_y

  The y position of the tile.
- double major_radius

  The radius of the smallest bounding circle.
- double minor_radius

  The radius of the largest inscribed circle.
- sf::CircleShape node_sprite

  A circle shape to mark the tile node.
- sf::ConvexShape tile_sprite

  A convex shape which represents the tile.
- sf::ConvexShape select_outline_sprite

  A convex shape which outlines the tile when selected.
- sf::CircleShape resource_chip_sprite

  A circle shape which represents a resource chip.
- sf::Text resource_text

  A text representation of the resource.

Private Member Functions

- void __setUpNodeSprite (void)

  Helper method to set up node sprite.
- void __setUpTileSprite (void)

  Helper method to set up tile sprite.
- void __setUpSelectOutlineSprite (void)

  Helper method to set up select outline sprite.
- void __setUpResourceChipSprite (void)

  Helper method to set up resource chip sprite.
- void __setResourceText (void)

  Helper method to set up resource text.
- bool __isClicked (void)

  Helper method to determine if tile was clicked on.

Private Attributes

- AssetsManager * assets_manager_ptr

  A pointer to the assets manager.
- InputsHandler * inputs_handler_ptr

  A pointer to the inputs handler.
- MessagesHandler * messages_handler_ptr

  A pointer to the messages handler.
- sf::RenderWindow * render_window_ptr

  A pointer to the render window.

3.3.1 Detailed Description

A class which defines a hex tile of the hex map.

3.3.2 Constructor & Destructor Documentation

3.3.2.1 HexTile()

```
HexTile::HexTile (
            double position_x,
            double position_y,
            AssetsManager * assets_manager_ptr,
            InputsHandler * inputs_handler_ptr,
            MessagesHandler * messages_handler_ptr,
            sf::RenderWindow * render_window_ptr )
```

Constructor for the HexTile class.

Ref: Wikipedia [2023]

Parameters

position_x	The x position of the tile.
position_y	The y position of the tile.
assets_manager_ptr	Pointer to the assets manager.
inputs_handler_ptr	Pointer to the inputs handler.
messages_handler_ptr	Pointer to the messages handler.
render_window_ptr	Pointer to the render window.

```
300 {
301     //  1. set attributes
302     this->assets_manager_ptr = assets_manager_ptr;
303     this->inputs_handler_ptr = inputs_handler_ptr;
304     this->messages_handler_ptr = messages_handler_ptr;
305     this->render_window_ptr = render_window_ptr;
306 
307     this->show_node = false;
308     this->show_resource = false;
309     this->resource_assessed = false;
310     this->is_selected = false;
311 
312     this->frame = 0;
313 
314     this->position_x = position_x;
315     this->position_y = position_y;
316 
317     this->major_radius = 32;
318     this->minor_radius = (sqrt(3) / 2) * this->major_radius;
319 
320     //  2. set up and position drawable attributes
321     this->__setUpNodeSprite();
322     this->__setUpTileSprite();
323     this->__setUpSelectOutlineSprite();
324     this->__setUpResourceChipSprite();
325     this->__setResourceText();
326 
327     //  3. set tile type and resource (default to forest and average)
328     this->setTileType(TileType :: FOREST);
329     this->setTileResource(TileResource :: AVERAGE);
330 
```

```
331     std::cout « "HexTile constructed at " « this « std::endl;
332
333     return;
334 }   /* HexTile() */
```

3.3.2.2 ~HexTile()

```
HexTile::~HexTile (
            void  )
```

Destructor for the HexTile class.

```
657 {
658     std::cout « "HexTile at " « this « " destroyed" « std::endl;
659
660     return;
661 }   /* ~HexTile() */
```

3.3.3 Member Function Documentation

3.3.3.1 __isClicked()

```
bool HexTile::__isClicked (
            void  )  [private]
```

Helper method to determine if tile was clicked on.

Returns

Boolean indicating whether or not tile was clicked on.

```
236 {
237     sf::Vector2i mouse_position = sf::Mouse::getPosition(*render_window_ptr);
238
239     double mouse_x = mouse_position.x;
240     double mouse_y = mouse_position.y;
241
242     double distance = sqrt(
243         pow(this->position_x - mouse_x, 2) +
244         pow(this->position_y - mouse_y, 2)
245     );
246
247     if (distance < this->minor_radius) {
248         return true;
249     }
250     else {
251         return false;
252     }
253 }   /* __isClicked() */
```

3.3.3.2 __setResourceText()

```
void HexTile::__setResourceText (
            void  )  [private]
```

Helper method to set up resource text.

```
159 {
160     this->resource_text.setFont(*(assets_manager_ptr->getFont("DroidSansMono")));
161 
162     switch (this->tile_resource) {
163         case (TileResource :: POOR): {
164             this->resource_text.setString("-2");
165 
166             break;
167         }
168 
169         case (TileResource :: BELOW_AVERAGE): {
170             this->resource_text.setString("-1");
171 
172             break;
173         }
174 
175         case (TileResource :: AVERAGE): {
176             this->resource_text.setString("0");
177 
178             break;
179         }
180 
181         case (TileResource :: ABOVE_AVERAGE): {
182             this->resource_text.setString("+1");
183 
184             break;
185         }
186 
187         case (TileResource :: GOOD): {
188             this->resource_text.setString("+2");
189 
190             break;
191         }
192 
193         default: {
194             this->resource_text.setString("?");
195 
196             break;
197         }
198     }
199 
200     if (not this->resource_assessed) {
201         this->resource_text.setString("?");
202     }
203 
204     this->resource_text.setCharacterSize(16);
205 
206     this->resource_text.setOrigin(
207         this->resource_text.getLocalBounds().width / 2,
208         this->resource_text.getLocalBounds().height / 2
209     );
210 
211     this->resource_text.setFillColor(sf::Color(0, 0, 0, 255));
212 
213     this->resource_text.setPosition(
214         this->position_x,
215         this->position_y - 4
216     );
217 
218     return;
219 }   /* __setResourceText() */
```

3.3.3.3 __setUpNodeSprite()

```
void HexTile::__setUpNodeSprite (
            void  )  [private]
```

Helper method to set up node sprite.

```
34 {
```

```
35      this->node_sprite.setRadius(4);
36
37      this->node_sprite.setOrigin(
38          this->node_sprite.getLocalBounds().width / 2,
39          this->node_sprite.getLocalBounds().height / 2
40      );
41
42      this->node_sprite.setPosition(this->position_x, this->position_y);
43
44      this->node_sprite.setFillColor(sf::Color(255, 0, 0, 255));
45
46      return;
47  }   /* __setUpNodeSprite() */
```

3.3.3.4 __setUpResourceChipSprite()

```
void HexTile::__setUpResourceChipSprite (
              void  )  [private]
```

Helper method to set up resource chip sprite.

```
132 {
133     this->resource_chip_sprite.setRadius(2 * this->minor_radius / 3);
134
135     this->resource_chip_sprite.setOrigin(
136         this->resource_chip_sprite.getLocalBounds().width / 2,
137         this->resource_chip_sprite.getLocalBounds().height / 2
138     );
139
140     this->resource_chip_sprite.setPosition(this->position_x, this->position_y);
141
142     this->resource_chip_sprite.setFillColor(sf::Color(175, 175, 175, 175));
143
144     return;
145 }   /* __setUpResourceChip() */
```

3.3.3.5 __setUpSelectOutlineSprite()

```
void HexTile::__setUpSelectOutlineSprite (
              void  )  [private]
```

Helper method to set up select outline sprite.

```
96 {
97      int n_points = 6;
98
99      this->select_outline_sprite.setPointCount(n_points);
100
101     for (int i = 0; i < n_points; i++) {
102         this->select_outline_sprite.setPoint(
103             i,
104             sf::Vector2f(
105                 this->position_x + this->major_radius * cos((30 + 60 * i) * (M_PI / 180)),
106                 this->position_y + this->major_radius * sin((30 + 60 * i) * (M_PI / 180))
107             )
108         );
109     }
110
111     this->select_outline_sprite.setOutlineThickness(4);
112     this->select_outline_sprite.setOutlineColor(sf::Color(255, 0, 0, 255));
113
114     this->select_outline_sprite.setFillColor(sf::Color(0, 0, 0, 0));
115
116     return;
117 }   /* __setUpSelectOutline() */
```

3.3.3.6 __setUpTileSprite()

```
void HexTile::__setUpTileSprite (
            void  )  [private]
```

Helper method to set up tile sprite.

```
62 {
63     int n_points = 6;
64 
65     this->tile_sprite.setPointCount(n_points);
66 
67     for (int i = 0; i < n_points; i++) {
68         this->tile_sprite.setPoint(
69             i,
70             sf::Vector2f(
71                 this->position_x + this->major_radius * cos((30 + 60 * i) * (M_PI / 180)),
72                 this->position_y + this->major_radius * sin((30 + 60 * i) * (M_PI / 180))
73             )
74         );
75     }
76 
77     this->tile_sprite.setOutlineThickness(1);
78     this->tile_sprite.setOutlineColor(sf::Color(175, 175, 175, 255));
79 
80     return;
81 }   /* __setUpTileSprite() */
```

3.3.3.7 assess()

```
void HexTile::assess (
            void  )
```

Method to assess the tile's resource.

```
555 {
556     this->resource_assessed = true;
557     this->__setResourceText();
558 
559     return;
560 }   /* assess() */
```

3.3.3.8 draw()

```
void HexTile::draw (
            void  )
```

Method to draw the hex tile to the render window. To be called only once per frame!

```
611 {
612     //  1. draw hex
613     this->render_window_ptr->draw(this->tile_sprite);
614 
615     //  2. draw node
616     if (this->show_node) {
617         this->render_window_ptr->draw(this->node_sprite);
618     }
619 
620     //  3. draw resource
621     if (this->show_resource) {
622         this->render_window_ptr->draw(this->resource_chip_sprite);
623         this->render_window_ptr->draw(this->resource_text);
624     }
625 
626     //  4. draw selection outline
627     if (this->is_selected) {
628         this->select_outline_sprite.setOutlineColor(
629             sf::Color(
630                 255,
```

```
631                 0,
632                 0,
633                 255 * pow(cos((M_PI * this->frame) / (1.5 * FRAMES_PER_SECOND)), 2)
634             )
635         );
636 
637         this->render_window_ptr->draw(this->select_outline_sprite);
638     }
639 
640     this->frame++;
641     return;
642 }   /* draw() */
```

3.3.3.9 process()

```
void HexTile::process (
             void  )
```

Method to process HexTile. To be called once per frame.

```
575 {
576     //  1. handle inputs
577     if (inputs_handler_ptr->mouse_left_click) {
578         if (this->__isClicked()) {
579             std::cout « "Tile (" « this->position_x « ", " « this->position_y «
580                 ") was selected" « std::endl;
581 
582             this->is_selected = true;
583         }
584 
585         else {
586             this->is_selected = false;
587         }
588     }
589 
590     if (inputs_handler_ptr->mouse_right_click) {
591         this->is_selected = false;
592     }
593 
594     return;
595 }   /* process() */
```

3.3.3.10 setTileResource() [1/2]

```
void HexTile::setTileResource (
             double input_value )
```

Method to set the tile resource (by numeric input).

Parameters

input_value	A numerical input in the closed interval [0, 1].

```
480 {
481     //  1. check input
482     if (input_value < 0 or input_value > 1) {
483         std::string error_str = "ERROR  HexTile::setTileResource()  given input value is ";
484         error_str += "not in the closed interval [0, 1]";
485 
486         #ifdef _WIN32
487             std::cout « error_str « std::endl;
488         #endif  /* _WIN32 */
489 
490         throw std::runtime_error(error_str);
491     }
492 
```

```
493     //  2. convert input value to tile resource
494     TileResource tile_resource;
495
496     if (input_value <= tile_resource_cumulative_probabilities[0]) {
497         tile_resource = TileResource :: POOR;
498     }
499     else if (input_value <= tile_resource_cumulative_probabilities[1]) {
500         tile_resource = TileResource :: BELOW_AVERAGE;
501     }
502     else if (input_value <= tile_resource_cumulative_probabilities[2]) {
503         tile_resource = TileResource :: AVERAGE;
504     }
505     else if (input_value <= tile_resource_cumulative_probabilities[3]) {
506         tile_resource = TileResource :: ABOVE_AVERAGE;
507     }
508     else {
509         tile_resource = TileResource :: GOOD;
510     }
511
512     //  3. call alternate method
513     this->setTileResource(tile_resource);
514
515     return;
516 }   /* setTileResource(double) */
```

3.3.3.11 setTileResource() [2/2]

```
void HexTile::setTileResource (
              TileResource tile_resource )
```

Method to set the tile resource (by enum value).

Parameters

tile_resource	The resource (TileResource) value to attribute to the tile.

```
458 {
459     this->tile_resource = tile_resource;
460     this->__setResourceText();
461
462     return;
463 }   /* setTileResource(TileResource) */
```

3.3.3.12 setTileType() [1/2]

```
void HexTile::setTileType (
              double input_value )
```

Method to set the tile type (by numeric input).

Parameters

input_value	A numerical input in the closed interval [0, 1].

```
408 {
409     //  1. check input
410     if (input_value < 0 or input_value > 1) {
411         std::string error_str = "ERROR  HexTile::setTileType()  given input value is ";
412         error_str += "not in the closed interval [0, 1]";
413
414         #ifdef _WIN32
415             std::cout « error_str « std::endl;
```

```
416         #endif  /* _WIN32 */
417
418         throw std::runtime_error(error_str);
419     }
420
421     //  2. convert input value to tile type
422     TileType tile_type;
423
424     if (input_value <= tile_type_cumulative_probabilities[0]) {
425         tile_type = TileType :: LAKE;
426     }
427     else if (input_value <= tile_type_cumulative_probabilities[1]) {
428         tile_type = TileType :: PLAINS;
429     }
430     else if (input_value <= tile_type_cumulative_probabilities[2]) {
431         tile_type = TileType :: FOREST;
432     }
433     else {
434         tile_type = TileType :: MOUNTAINS;
435     }
436
437     //  3. call alternate method
438     this->setTileType(tile_type);
439
440     return;
441 }   /* setTileType(double) */
```

3.3.3.13 setTileType() [2/2]

```
void HexTile::setTileType (
            TileType tile_type )
```

Method to set the tile type (by enum value).

Parameters

tile_type	The type (TileType) to set the tile to.

```
349 {
350     this->tile_type = tile_type;
351
352     switch (this->tile_type) {
353         case (TileType :: FOREST): {
354             this->tile_sprite.setFillColor(FOREST_GREEN);
355
356             break;
357         }
358
359         case (TileType :: LAKE): {
360             this->tile_sprite.setFillColor(LAKE_BLUE);
361
362             break;
363         }
364
365         case (TileType :: MOUNTAINS): {
366             this->tile_sprite.setFillColor(MOUNTAINS_GREY);
367
368             break;
369         }
370
371         case (TileType :: OCEAN): {
372             this->tile_sprite.setFillColor(OCEAN_BLUE);
373
374             break;
375         }
376
377         case (TileType :: PLAINS): {
378             this->tile_sprite.setFillColor(PLAINS_YELLOW);
379
380             break;
381         }
382
383         default: {
384             // do nothing!
385
```

```
386             break;
387         }
388     }
389
390     return;
391 }   /* setTileType(TileType) */
```

3.3.3.14 toggleResourceOverlay()

```
void HexTile::toggleResourceOverlay (
             void  )
```

Method to toggle the tile resource overlay.

```
531 {
532     if (this->show_resource) {
533         this->show_resource = false;
534     }
535     else {
536         this->show_resource = true;
537     }
538
539     return;
540 }   /* toggleResourceOverlay() */
```

3.3.4 Member Data Documentation

3.3.4.1 assets_manager_ptr

```
AssetsManager* HexTile::assets_manager_ptr  [private]
```

A pointer to the assets manager.

3.3.4.2 frame

```
int HexTile::frame
```

The current frame of this object.

3.3.4.3 inputs_handler_ptr

```
InputsHandler* HexTile::inputs_handler_ptr  [private]
```

A pointer to the inputs handler.

3.3.4.4 is_selected

```
bool HexTile::is_selected
```

A boolean which indicates whether or not the tile is selected.

3.3.4.5 major_radius

```
double HexTile::major_radius
```

The radius of the smallest bounding circle.

3.3.4.6 messages_handler_ptr

```
MessagesHandler* HexTile::messages_handler_ptr  [private]
```

A pointer to the messages handler.

3.3.4.7 minor_radius

```
double HexTile::minor_radius
```

The radius of the largest inscribed circle.

3.3.4.8 node_sprite

```
sf::CircleShape HexTile::node_sprite
```

A circle shape to mark the tile node.

3.3.4.9 position_x

```
double HexTile::position_x
```

The x position of the tile.

3.3.4.10 position_y

```
double HexTile::position_y
```

The y position of the tile.

3.3.4.11 render_window_ptr

```
sf::RenderWindow* HexTile::render_window_ptr  [private]
```

A pointer to the render window.

3.3.4.12 resource_assessed

```
bool HexTile::resource_assessed
```

A boolean which indicates whether or not the resource has been assessed.

3.3.4.13 resource_chip_sprite

```
sf::CircleShape HexTile::resource_chip_sprite
```

A circle shape which represents a resource chip.

3.3.4.14 resource_text

```
sf::Text HexTile::resource_text
```

A text representation of the resource.

3.3.4.15 select_outline_sprite

```
sf::ConvexShape HexTile::select_outline_sprite
```

A convex shape which outlines the tile when selected.

3.3.4.16 show_node

```
bool HexTile::show_node
```

A boolean which indicates whether or not to show the tile node.

3.3.4.17 show_resource

```
bool HexTile::show_resource
```

A boolean which indicates whether or not to show resource value.

3.3.4.18 tile_resource

```
TileResource HexTile::tile_resource
```

3.3.4.19 tile_sprite

```
sf::ConvexShape HexTile::tile_sprite
```

A convex shape which represents the tile.

3.3.4.20 tile_type

```
TileType HexTile::tile_type
```

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

- header/HexMap/HexTile.h
- source/HexMap/HexTile.cpp

3.4 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

- bool mouse_left_click

  A boolean which indicates if the mouse left button has been clicked.
- bool mouse_right_click

  A boolean which indicates if the mouse right button has been clicked.
- 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.

3.4.1 Detailed Description

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

3.4.2 Constructor & Destructor Documentation

3.4.2.1 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() */
```

3.4.2.2 ~InputsHandler()

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

Destructor for the InputsHandler class.

```
527 {
528     std::cout « "InputsHandler at " « this « " destroyed" « std::endl;
529
530     return;
531 }   /* ~InputsHandler() */
```

3.4.3 Member Function Documentation

3.4.3.1 __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() */
```

3.4.3.2 printKeysPressed()

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

Method to print out which keys are currently pressed.

```
473 {
474     std::string print_str = "";
475
476     for (size_t i = 0; i < this->key_press_vec.size(); i++) {
477         if (this->key_press_vec[i]) {
478             print_str += this->key_code_map[sf::Keyboard::Key(i)];
479             print_str += ", ";
480         }
481     }
482
483     if (not print_str.empty()) {
484         std::cout « "Keys pressed: " « print_str « std::endl;
485     }
486
487     return;
488 }   /* printKeysPressed() */
```

3.4.3.3 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         case (sf::Event::MouseButtonPressed): {
426             if (sf::Mouse::isButtonPressed(sf::Mouse::Left))
427             {
428                 this->mouse_left_click = true;
429
430                 std::cout « "left click        " « std::endl;
431             }
432
```

```
433             if (sf::Mouse::isButtonPressed(sf::Mouse::Right))
434             {
435                 this->mouse_right_click = true;
436 
437                 std::cout « "right click        " « std::endl;
438             }
439 
440             break;
441         }
442 
443         case (sf::Event::MouseButtonReleased): {
444             this->mouse_left_click = false;
445             this->mouse_right_click = false;
446 
447             break;
448         }
449 
450         default: {
451             //  do nothing!
452 
453             break;
454         }
455     }
456 
457     return;
458 }   /* process() */
```

3.4.3.4 reset()

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

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

```
503 {
504     this->mouse_left_click = false;
505     this->mouse_right_click = false;
506 
507     for (size_t i = 0; i < this->key_press_vec.size(); i++) {
508         this->key_pressed_once_vec[i] = false;
509     }
510 
511     return;
512 }   /* reset() */
```

3.4.4 Member Data Documentation

3.4.4.1 key_code_map

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

A map from key codes to corresponding string representations.

3.4.4.2 key_press_vec

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

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

3.4.4.3 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.

3.4.4.4 mouse_left_click

```
bool InputsHandler::mouse_left_click
```

A boolean which indicates if the mouse left button has been clicked.

3.4.4.5 mouse_right_click

```
bool InputsHandler::mouse_right_click
```

A boolean which indicates if the mouse right button has been clicked.

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

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

3.5 MessagesHandler Class Reference

A class which handles message traffic between game objects.

```
#include <MessagesHandler.h>
```

Public Member Functions

- MessagesHandler (void)

  Constructor for the MessagesHandler class.
- void process (void)

  Method to process messages. To be called once per frame.
- ~MessagesHandler (void)

  Destructor for the MessagesHandler class.

3.5.1 Detailed Description

A class which handles message traffic between game objects.

3.5.2 Constructor & Destructor Documentation

3.5.2.1 MessagesHandler()

```
MessagesHandler::MessagesHandler (
            void  )
```

Constructor for the MessagesHandler class.

```
46 {
47     //...
48
49     std::cout « "MessagesHandler constructed at " « this « std::endl;
50
51     return;
52 }   /* MessagesHandler() */
```

3.5.2.2 ∼MessagesHandler()

```
MessagesHandler::∼MessagesHandler (
            void  )
```

Destructor for the MessagesHandler class.

```
86 {
87     std::cout « "MessagesHandler at " « this « " destroyed" « std::endl;
88
89     return;
90 }   /* ~MessagesHandler() */
```

3.5.3 Member Function Documentation

3.5.3.1 process()

```
void MessagesHandler::process (
            void  )
```

Method to process messages. To be called once per frame.

```
67 {
68     //...
69
70     return;
71 }   /* process() */
```

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

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

Chapter 4

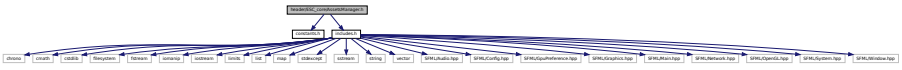
File Documentation

4.1 header/ESC_core/AssetsManager.h File Reference

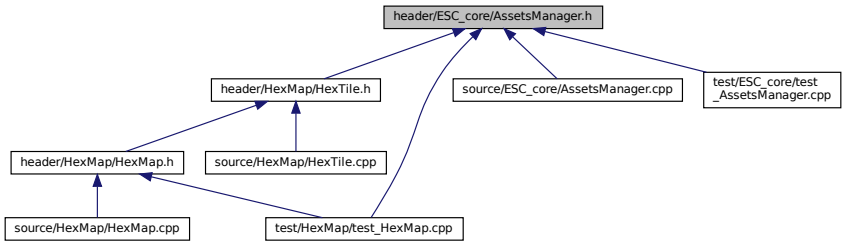
Header file for the AssetsManager class.

```
#include "constants.h"
#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.

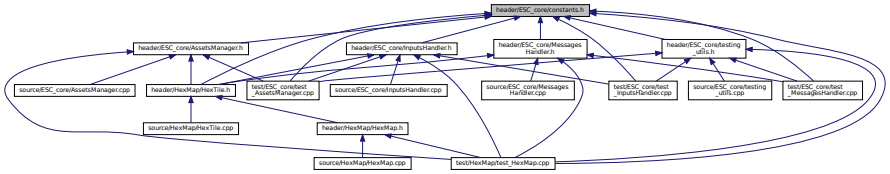
4.1.1 Detailed Description

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

  Target frames per second.
- const double SECONDS_PER_FRAME = 1.0 / 60

  Target seconds per frame (just reciprocal of target frames per second).

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
```

Target frames per second.

4.2.2.2 SECONDS_PER_FRAME

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

Target seconds per frame (just reciprocal of target frames per second).

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]

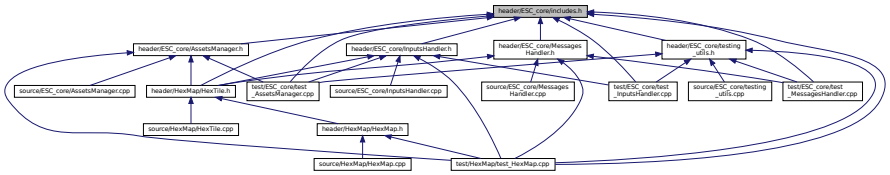
4.4 header/ESC_core/includes.h File Reference

Header file for various includes.

```
#include <chrono>
#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.

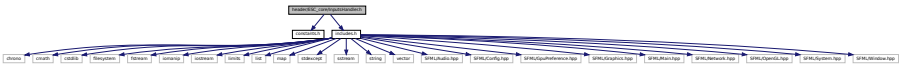
Ref: Gomila [2023]

4.5 header/ESC_core/InputsHandler.h File Reference

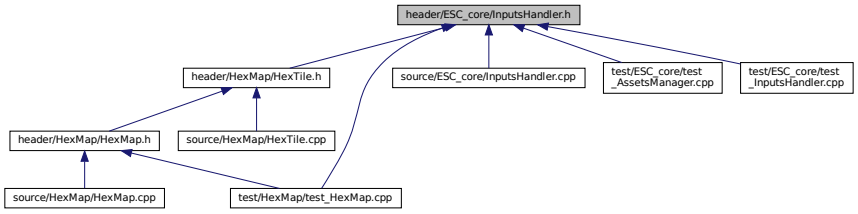
Header file for the InputsHandler class.

```
#include "constants.h"
#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

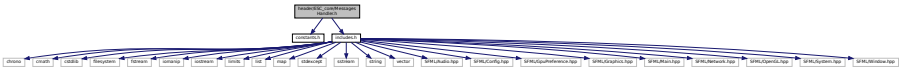
Header file for the InputsHandler class.

4.6 header/ESC_core/MessagesHandler.h File Reference

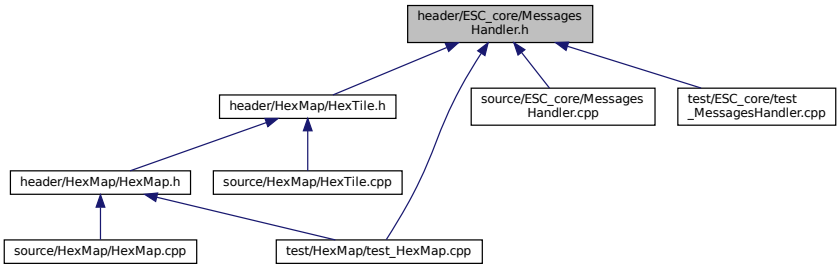
Header file for the MessagesHandler class.

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

Include dependency graph for MessagesHandler.h:



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



Classes

- class MessagesHandler

  A class which handles message traffic between game objects.

4.6.1 Detailed Description

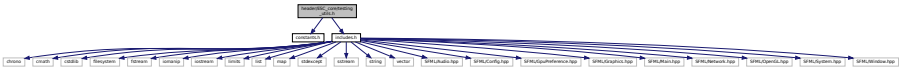
Header file for the MessagesHandler class.

4.7 header/ESC_core/testing_utils.h File Reference

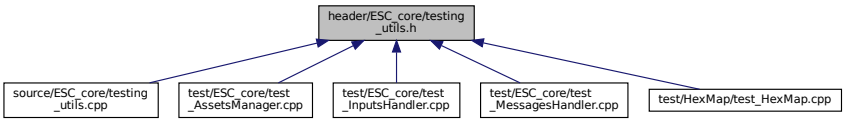
Header file for various testing utilities.

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

Include dependency graph for testing_utils.h:



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



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.

Variables

- const double FLOAT_TOLERANCE = 1e-6

  Tolerance for floating point equality tests.

4.7.1 Detailed Description

Header file for various testing utilities.

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

4.7.2 Function Documentation

4.7.2.1 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() */
```

4.7.2.2 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() */
```

4.7.2.3 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() */
```

4.7.2.4 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() */
```

4.7.2.5 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() */
```

4.7.2.6 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() */
```

4.7.2.7 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() */
```

4.7.2.8 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() */
```

4.7.2.9 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() */
```

4.7.2.10 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() */
```

4.7.3 Variable Documentation

4.7.3.1 FLOAT_TOLERANCE

```
const double FLOAT_TOLERANCE = 1e-6
```

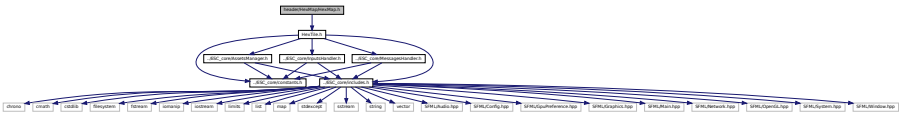
Tolerance for floating point equality tests.

4.8 header/HexMap/HexMap.h File Reference

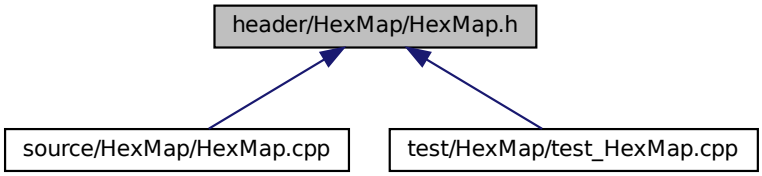
Header file for the HexMap class.

```
#include "HexTile.h"
```

Include dependency graph for HexMap.h:



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



Classes

- class HexMap

  A class which defines a hex map of hex tiles.

4.8.1 Detailed Description

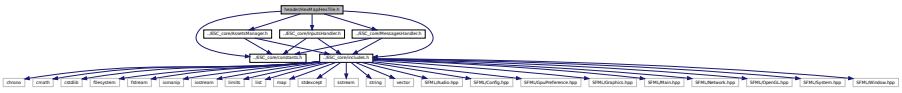
Header file for the HexMap class.

4.9 header/HexMap/HexTile.h File Reference

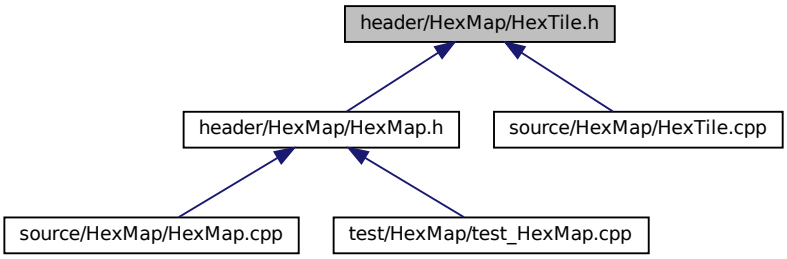
Header file for the HexTile class.

```
#include "../ESC_core/constants.h"
#include "../ESC_core/includes.h"
#include "../ESC_core/AssetsManager.h"
#include "../ESC_core/InputsHandler.h"
#include "../ESC_core/MessagesHandler.h"
```

Include dependency graph for HexTile.h:



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



Classes

- class HexTile

  A class which defines a hex tile of the hex map.

Enumerations

- enum TileType {
  FOREST , LAKE , MOUNTAINS , OCEAN ,
  PLAINS , N_TILE_TYPES }

  An enumeration of the different tile types.
- enum TileResource {
  POOR , BELOW_AVERAGE , AVERAGE , ABOVE_AVERAGE ,
  GOOD , N_TILE_RESOURCES }

  An enumeration of the different tile resource values.

Functions

- const sf::Color FOREST_GREEN (34, 139, 34)

  The base colour of a forest tile.
- const sf::Color LAKE_BLUE (0, 102, 204)

  The base colour of a lake (water) tile.
- const sf::Color MOUNTAINS_GREY (97, 110, 113)

  The base colour of a mountains tile.
- const sf::Color OCEAN_BLUE (0, 51, 102)

  The base colour of an ocean (water) tile.
- const sf::Color PLAINS_YELLOW (245, 222, 133)

  The base colour of a plains tile.

Variables

- const std::vector< double > tile_type_cumulative_probabilities
- const std::vector< double > tile_resource_cumulative_probabilities

4.9.1 Detailed Description

Header file for the HexTile class.

4.9.2 Enumeration Type Documentation

4.9.2.1 TileResource

```
enum TileResource
```

An enumeration of the different tile resource values.

Enumerator

POOR	A poor resource value.
BELOW_AVERAGE	A below average resource value.
AVERAGE	An average resource value.
ABOVE_AVERAGE	An above average resource value.
GOOD	A good resource value.
N_TILE_RESOURCES	A simple hack to get the number of elements in TileResource.

```
64                  {
65     POOR,
66     BELOW_AVERAGE,
67     AVERAGE,
68     ABOVE_AVERAGE,
69     GOOD,
70     N_TILE_RESOURCES
71 };
```

4.9.2.2 TileType

```
enum TileType
```

An enumeration of the different tile types.

Enumerator

FOREST	A forest tile.
LAKE	A lake tile.
MOUNTAINS	A mountains tile.
OCEAN	An ocean tile.
PLAINS	A plains tile.
N_TILE_TYPES	A simple hack to get the number of elements in TileType.

```
35              {
36     FOREST,
37     LAKE,
38     MOUNTAINS,
39     OCEAN,
40     PLAINS,
41     N_TILE_TYPES
42 };
```

4.9.3 Function Documentation

4.9.3.1 FOREST_GREEN()

```
const sf::Color FOREST_GREEN (
             34 ,
             139 ,
             34  )
```

The base colour of a forest tile.

4.9.3.2 LAKE_BLUE()

```
const sf::Color LAKE_BLUE (
             0 ,
             102 ,
             204  )
```

The base colour of a lake (water) tile.

4.9.3.3 MOUNTAINS_GREY()

```
const sf::Color MOUNTAINS_GREY (
             97 ,
             110 ,
             113  )
```

The base colour of a mountains tile.

4.9.3.4 OCEAN_BLUE()

```
const sf::Color OCEAN_BLUE (
             0 ,
             51 ,
             102  )
```

The base colour of an ocean (water) tile.

4.9.3.5 PLAINS_YELLOW()

```
const sf::Color PLAINS_YELLOW (
             245 ,
             222 ,
             133  )
```

The base colour of a plains tile.

4.9.4 Variable Documentation

4.9.4.1 tile_resource_cumulative_probabilities

```
const std::vector<double> tile_resource_cumulative_probabilities
```

Initial value:

```
= {
    0.10,
    0.30,
    0.70,
    0.90,
    1.00
}
```

4.9.4.2 tile_type_cumulative_probabilities

```
const std::vector<double> tile_type_cumulative_probabilities
```

Initial value:

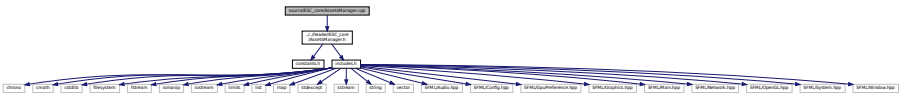
```
= {
    0.25,
    0.50,
    0.75,
    1.00
}
```

4.10 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:



4.10.1 Detailed Description

Implementation file for the AssetsManager class.

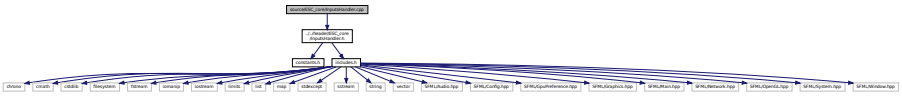
A class which manages visual and sound assets.

4.11 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:



4.11.1 Detailed Description

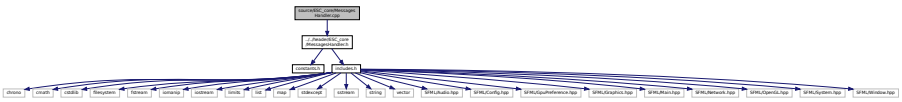
Implementation file for the InputsHandler class.

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

4.12 source/ESC_core/MessagesHandler.cpp File Reference

Implementation file for the MessagesHandler class.

```
#include "../../header/ESC_core/MessagesHandler.h"
```
Include dependency graph for MessagesHandler.cpp:



4.12.1 Detailed Description

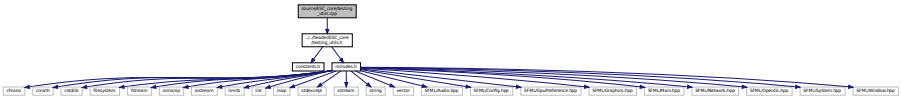
Implementation file for the MessagesHandler class.

A class which handles message traffic between game objects.

4.13 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.

4.13.1 Detailed Description

Implementation file for various testing utilities.

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

4.13.2 Function Documentation

4.13.2.1 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() */
```

4.13.2.2 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() */
```

4.13.2.3 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() */
```

4.13.2.4 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() */
```

4.13.2.5 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() */
```

4.13.2.6 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() */
```

4.13.2.7 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() */
```

4.13.2.8 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() */
```

4.13.2.9 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() */
```

4.13.2.10 testTruth()

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

Tests if the given statement is true.

Parameters

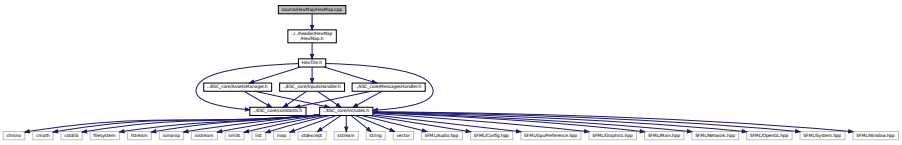
statement	The statement whose truth is to be tested ("1 == 0", for example).
file	The file in which the test is applied (you should be able to just pass in "__FILE__").
line	The line of the file in which the test is applied (you should be able to just pass in "__LINE__").

```
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() */
```

4.14 source/HexMap/HexMap.cpp File Reference

Implementation file for the HexMap class.

`#include "../../header/HexMap/HexMap.h"`
Include dependency graph for HexMap.cpp:



4.14.1 Detailed Description

Implementation file for the HexMap class.

A class which defines a hex map of hex tiles.

4.15 source/HexMap/HexTile.cpp File Reference

Implementation file for the HexTile class.

`#include "../../header/HexMap/HexTile.h"`
Include dependency graph for HexTile.cpp:

4.15.1 Detailed Description

Implementation file for the HexTile class.

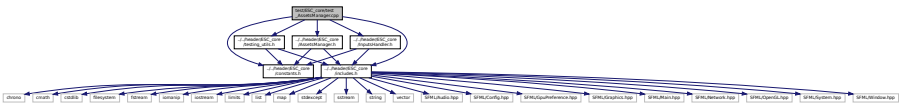
A class which defines a tile of a hex map.

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

Include dependency graph for test_AssetsManager.cpp:



Functions

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

4.16.1 Detailed Description

Suite of tests for the AssetsManager class.

A suite of tests for the AssetsManager class.

4.16.2 Function Documentation

4.16.2.1 main()

```
int main (
            int argc,
            char ** argv )
38 {
39     #ifdef _WIN32
40         activateVirtualTerminal();
41     #endif  /* _WIN32 */
42
43     printGold("\tTesting AssetsManager");
44     std::cout « std::endl;
45
46     srand(time(NULL));
47     int n_dots = 8;
48
49
50     try {
51         //  1. construct
52         InputsHandler inputs_handler;
53         AssetsManager assets_manager;
54
55
56         //  2. load/open some test assets
57         assets_manager.loadFont("assets/fonts/DroidSansMono.ttf", "DroidSansMono");
58         assets_manager.loadTexture(
59             "assets/ESC_brand/ESC_key_98x81.png",
60             "ESC_key_98x81"
61         );
62         assets_manager.loadSound("assets/ESC_brand/key_press.ogg", "key_press");
63         assets_manager.loadTrack(
64             "assets/audio/tracks/AlexanderBlu_BackgroundElectronicModernMusic.ogg",
65             "AlexanderBlu_BackgroundElectronicModernMusic"
66         );
67
68
69         //  3. test game loop
70         sf::Clock clock;
71         sf::Event event;
72         sf::RenderWindow window(sf::VideoMode(800, 600), "Testing AssetsManager");
73
74         double screen_width = window.getSize().x;
75         double screen_height = window.getSize().y;
76
77         testFloatEquals(
78             screen_width,
79             800,
80             __FILE__,
81             __LINE__
82         );
83
84         testFloatEquals(
85             screen_height,
86             600,
87             __FILE__,
88             __LINE__
89         );
90
91         unsigned long long int frame = 0;
92         double time_since_run_s = 0;
93
94         assets_manager.playTrack();
95
96         sf::Sprite ESC_key(*(assets_manager.getTexture("ESC_key_98x81")));
97
98         double sprite_width = ESC_key.getLocalBounds().width;
99         double sprite_height = ESC_key.getLocalBounds().height;
100
101          double sprite_velocity_x = 256 * (2 * ((double)rand() / RAND_MAX) - 1);
102          double sprite_velocity_y = 256 * (2 * ((double)rand() / RAND_MAX) - 1);
103
104          ESC_key.setOrigin(sprite_width / 2, sprite_height / 2);
105          ESC_key.setPosition(
106              (screen_width - sprite_width) * ((double)rand() / RAND_MAX) + sprite_width / 2,
107              (screen_height - sprite_height) * ((double)rand() / RAND_MAX) + sprite_height / 2
108          );
109
110          sf::Text click_text(
111              "CLICK!",
112              *(assets_manager.getFont("DroidSansMono")),
113              16
114          );
115
116          double text_width = click_text.getLocalBounds().width;
117          double text_height = click_text.getLocalBounds().height;
```

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

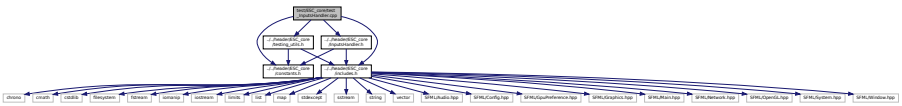
```
205         std::cout « std::endl;
206         throw;
207     }
208
209
210     //...
211
212     printGold(" ");
213     for (int i = 0; i < n_dots; i++) {
214         printGold(".");
215     }
216     printGold(" ");
217     printGreen("PASS");
218     std::cout « std::endl;
219
220     return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

4.17 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/includes.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)

4.17.1 Detailed Description

Suite of tests for the InputsHandler class.

A suite of tests for the InputsHandler class.

4.17.2 Function Documentation

4.17.2.1 main()

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

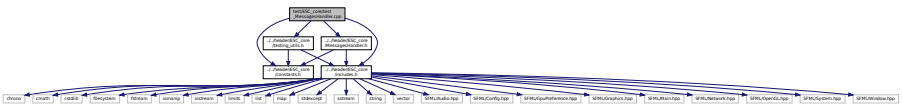
```
117
118                 inputs_handler.printKeysPressed();
119
120                 if (inputs_handler.key_pressed_once_vec[sf::Keyboard::Enter]) {
121                     std::cout « "Enter" « std::endl;
122                 }
123
124
125
126                 inputs_handler.reset();
127
128                 std::cout « frame « " : " « time_since_run_s « "\r" « std::flush;
129                 frame++;
130             }
131         }
132     }
133
134
135     catch (...) {
136         //...
137
138         printGold(" ");
139         for (int i = 0; i < n_dots; i++) {
140             printGold(".");
141         }
142         printGold(" ");
143         printRed("FAIL");
144         std::cout « std::endl;
145         throw;
146     }
147
148
149     //...
150
151     printGold(" ");
152     for (int i = 0; i < n_dots; i++) {
153         printGold(".");
154     }
155     printGold(" ");
156     printGreen("PASS");
157     std::cout « std::endl;
158
159     return 0;
160 }   /* main() */
```

4.18 test/ESC_core/test_MessagesHandler.cpp File Reference

Suite of tests for the MessagesHandler class.

```
#include "../../header/ESC_core/constants.h"
#include "../../header/ESC_core/includes.h"
#include "../../header/ESC_core/testing_utils.h"
#include "../../header/ESC_core/MessagesHandler.h"
```

Include dependency graph for test_MessagesHandler.cpp:



Functions

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

4.18.1 Detailed Description

Suite of tests for the MessagesHandler class.

A suite of tests for the MessagesHandler class.

4.18.2 Function Documentation

4.18.2.1 main()

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

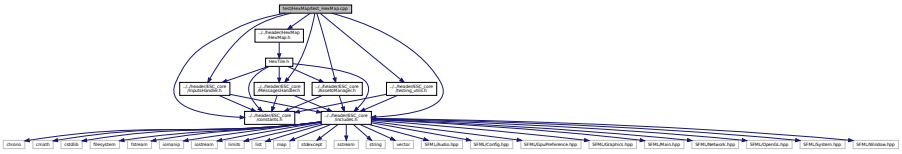
```
108         for (int i = 0; i < n_dots; i++) {
109             printGold(".");
110         }
111         printGold(" ");
112         printRed("FAIL");
113         std::cout « std::endl;
114         throw;
115     }
116 
117 
118     //...
119 
120     printGold(" ");
121     for (int i = 0; i < n_dots; i++) {
122         printGold(".");
123     }
124     printGold(" ");
125     printGreen("PASS");
126     std::cout « std::endl;
127 
128     return 0;
129 }   /* main() */
```

4.19 test/HexMap/test_HexMap.cpp File Reference

Suite of tests for the HexMap class.

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

Include dependency graph for test_HexMap.cpp:



Functions

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

4.19.1 Detailed Description

Suite of tests for the HexMap class.

A suite of tests for the HexMap class.

4.19.2 Function Documentation

4.19.2.1 main()

```
int main (
              int argc,
              char ** argv )
41 {
42     #ifdef _WIN32
43         activateVirtualTerminal();
44     #endif  /* _WIN32 */
45
46     printGold("\tTesting HexMap");
47     std::cout « std::endl;
48
49     srand(time(NULL));
50     int n_dots = 8;
51
52
53     try {
54         //  1. construct, load/open some test assets
55         AssetsManager assets_manager;
56         InputsHandler inputs_handler;
57         MessagesHandler messages_handler;
58
59         assets_manager.loadFont("assets/fonts/DroidSansMono.ttf", "DroidSansMono");
60
61
62         //  2. test game loop
63         sf::Clock clock;
64         sf::Event event;
65         sf::RenderWindow window(sf::VideoMode(1200, 800), "Testing AssetsManager");
66
67         double screen_width = window.getSize().x;
68         double screen_height = window.getSize().y;
69
70         testFloatEquals(
71             screen_width,
72             1200,
73             __FILE__,
74             __LINE__
75         );
76
77         testFloatEquals(
78             screen_height,
79             800,
80             __FILE__,
81             __LINE__
82         );
83
84         unsigned long long int frame = 0;
85         double time_since_run_s = 0;
86
87         HexMap hex_map(
88             6,
89             &assets_manager,
90             &inputs_handler,
91             &messages_handler,
92             &window
93         );
94
95         while (window.isOpen()) {
96             time_since_run_s = clock.getElapsedTime().asSeconds();
97
98             if (
99                 time_since_run_s >= (frame + 1) * SECONDS_PER_FRAME
100             ) {
101                 while (window.pollEvent(event))
102                 {
103                     inputs_handler.process(&event);
104
105                     if (event.type == sf::Event::Closed) {
106                         window.close();
107                     }
108                 }
109
110                 hex_map.process();
111
112                 if (inputs_handler.key_pressed_once_vec[sf::Keyboard::Q]) {
113                     std::cout « "Q" « std::endl;
114                     hex_map.reroll();
115                 }
116
117                 if (inputs_handler.key_pressed_once_vec[sf::Keyboard::R]) {
118                     std::cout « "R" « std::endl;
119                     hex_map.toggleResourceOverlay();
120                 }
```

```
121
122                 if (inputs_handler.key_pressed_once_vec[sf::Keyboard::A]) {
123                     std::cout « "A" « std::endl;
124                     hex_map.assess();
125                 }
126
127                 window.clear();
128
129                 hex_map.draw();
130
131                 window.display();
132
133                 inputs_handler.reset();
134
135                 std::cout « frame « " : " « time_since_run_s « "\r" « std::flush;
136                 frame++;
137             }
138         }
139     }
140
141
142     catch (...) {
143         //...
144
145         printGold(" ");
146         for (int i = 0; i < n_dots; i++) {
147             printGold(".");
148         }
149         printGold(" ");
150         printRed("FAIL");
151         std::cout « std::endl;
152         throw;
153     }
154
155
156     //...
157
158     printGold(" ");
159     for (int i = 0; i < n_dots; i++) {
160         printGold(".");
161     }
162     printGold(" ");
163     printGreen("PASS");
164     std::cout « std::endl;
165
166     return 0;
167 }   /* main() */
```

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