

Eng1 Documentation

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Chapter 1

Hierarchical Index

1.1 Class Hierarchy

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

Flow	7
FlowImplementation	7
Model	11
ModelImplementation	13
System	17
SystemImplementation	18

Chapter 2

Class Index

2.1 Class List

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

Flow	7
FlowImplementation	7
Model	11
ModellImplementation	13
System	17
SystemImplementation	18

Chapter 3

File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

/home/joaozenobio/CLionProjects/Eng1/src/lib/ Flow.h	21
/home/joaozenobio/CLionProjects/Eng1/src/lib/ FlowImplementation.h	21
/home/joaozenobio/CLionProjects/Eng1/src/lib/ Model.h	22
/home/joaozenobio/CLionProjects/Eng1/src/lib/ ModelImplementation.h	22
/home/joaozenobio/CLionProjects/Eng1/src/lib/ System.h	23
/home/joaozenobio/CLionProjects/Eng1/src/lib/ SystemImplementation.h	23

Chapter 4

Class Documentation

4.1 Flow Class Reference

Inheritance diagram for Flow:

4.2 FlowImplementation Class Reference

```
#include <FlowImplementation.h>
```

Inheritance diagram for FlowImplementation:

Collaboration diagram for FlowImplementation:

Public Member Functions

- `~FlowImplementation ()` override
- `FlowImplementation (std::string name, double value, System *systemBegin, System *systemEnd)`
- `FlowImplementation (const FlowImplementation &flow)`
- `FlowImplementation & operator= (const Flow &flow)`
- `void expression ()` override=0
- `std::string getName ()` const override
- `void setName (std::string n)` override
- `double getValue ()` const override
- `void setValue (double v)` override
- `System * getSystemBegin ()` const override
- `void setSystemBegin (System *system)` override
- `System * getSystemEnd ()` const override
- `void setSystemEnd (System *system)` override

Protected Attributes

- `std::string name`
- `double value`
- `System * systemBegin`
- `System * systemEnd`

4.2.1 Detailed Description

[Flow](#) that converges energy from a model to another.

4.2.2 Constructor & Destructor Documentation

4.2.2.1 ~FlowImplementation()

```
FlowImplementation::~~FlowImplementation ( ) [override], [default]
```

Default destructor

4.2.2.2 FlowImplementation() [1/2]

```
FlowImplementation::FlowImplementation (
    std::string name,
    double value,
    System * systemBegin,
    System * systemEnd )
```

Default constructor

Parameters

<i>name</i>	Initial flow name
<i>value</i>	Initial flow value
<i>systemBegin</i>	Initial system where the flow comes from
<i>systemEnd</i>	Initial system where the flow goes to

Returns

[Flow](#) with initial name, value, systemBegin and systemEnd

4.2.2.3 FlowImplementation() [2/2]

```
FlowImplementation::FlowImplementation (
    const FlowImplementation & flow )
```

Copy constructor

Parameters

<i>flow</i>	Flow to copy from
-------------	-----------------------------------

Returns

Copied flow

4.2.3 Member Function Documentation

4.2.3.1 expression()

```
void FlowImplementation::expression ( ) [override], [pure virtual]
```

Sets the expression of the flow

Implements [Flow](#).

4.2.3.2 getName()

```
std::string FlowImplementation::getName ( ) const [override], [virtual]
```

Get system name

Implements [Flow](#).

4.2.3.3 getSystemBegin()

```
System * FlowImplementation::getSystemBegin ( ) const [override], [virtual]
```

Get systemBegin

Implements [Flow](#).

4.2.3.4 getSystemEnd()

```
System * FlowImplementation::getSystemEnd ( ) const [override], [virtual]
```

Get systemEnd

Implements [Flow](#).

4.2.3.5 getValue()

```
double FlowImplementation::getValue ( ) const [override], [virtual]
```

Get system value

Implements [Flow](#).

4.2.3.6 operator=()

```
FlowImplementation & FlowImplementation::operator= (
    const Flow & flow )
```

Copy Assignment Operator

Parameters

<i>flow</i>	Flow to copy from
-------------	-----------------------------------

Returns

Copied flow

4.2.3.7 setName()

```
void FlowImplementation::setName (
    std::string n )    [override], [virtual]
```

Set system name

Parameters

<i>n</i>	Name for the flow
----------	-------------------

Implements [Flow](#).

4.2.3.8 setSystemBegin()

```
void FlowImplementation::setSystemBegin (
    System * system )    [override], [virtual]
```

Set systemBegin

Parameters

<i>system</i>	SystemBegin for the flow
---------------	--------------------------

Implements [Flow](#).

4.2.3.9 setSystemEnd()

```
void FlowImplementation::setSystemEnd (
    System * system )    [override], [virtual]
```

Set systemBegin

Parameters

<i>system</i>	SystemEnd for the flow
---------------	------------------------

Implements [Flow](#).

4.2.3.10 setValue()

```
void FlowImplementation::setValue (
    double v ) [override], [virtual]
```

Set system value

Parameters

<i>v</i>	Value for the flow
----------	--------------------

Implements [Flow](#).

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

- /home/joaozenobio/CLionProjects/Eng1/src/lib/FlowImplementation.h
- /home/joaozenobio/CLionProjects/Eng1/src/lib/FlowImplementation.cpp

4.3 Model Class Reference

Inheritance diagram for Model:

Public Member Functions

- virtual void [simulate](#) (double, double, double)=0
- virtual std::string [getName](#) () const =0
- virtual void [setName](#) (std::string)=0
- virtual double [getTime](#) () const =0
- virtual void [setTime](#) (std::string)=0
- virtual void [add](#) ([System](#) *)=0
- virtual void [add](#) ([Flow](#) *)=0

4.3.1 Member Function Documentation

4.3.1.1 add() [1/2]

```
virtual void Model::add (  
    Flow * ) [pure virtual]
```

Implemented in [ModelImplementation](#).

4.3.1.2 add() [2/2]

```
virtual void Model::add (  
    System * ) [pure virtual]
```

Implemented in [ModelImplementation](#).

4.3.1.3 getName()

```
virtual std::string Model::getName ( ) const [pure virtual]
```

Implemented in [ModelImplementation](#).

4.3.1.4 getTime()

```
virtual double Model::getTime ( ) const [pure virtual]
```

Implemented in [ModelImplementation](#).

4.3.1.5 setName()

```
virtual void Model::setName (  
    std::string ) [pure virtual]
```

Implemented in [ModelImplementation](#).

4.3.1.6 setTime()

```
virtual void Model::setTime (  
    std::string ) [pure virtual]
```

Implemented in [ModelImplementation](#).

4.3.1.7 simulate()

```
virtual void Model::simulate (
    double ,
    double ,
    double ) [pure virtual]
```

Implemented in [ModelImplementation](#).

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

- /home/joaozenobio/CLionProjects/Eng1/src/lib/Model.h

4.4 ModelImplementation Class Reference

Inheritance diagram for ModelImplementation:

Collaboration diagram for ModelImplementation:

Public Member Functions

- [~ModelImplementation](#) () override
- [ModelImplementation](#) (std::string name, double time)
- [ModelImplementation](#) (const [ModelImplementation](#) &model)
- [ModelImplementation](#) & operator= (const [ModelImplementation](#) &model)
- void [simulate](#) (double start, double end, double timestep) override
- std::string [getName](#) () const override
- void [setName](#) (std::string n) override
- double [getTime](#) () const override
- void [setTime](#) (std::string t) override
- void [add](#) ([System](#) *system) override
- void [add](#) ([Flow](#) *flow) override

Protected Attributes

- std::string **name**
- double **time**
- std::vector< [System](#) * > **systems**
- std::vector< [Flow](#) * > **flows**

4.4.1 Constructor & Destructor Documentation

4.4.1.1 ~ModelImplementation()

```
ModelImplementation::~ModelImplementation ( ) [override]
```

Default destructor

4.4.1.2 ModelImplementation() [1/2]

```
ModelImplementation::ModelImplementation (
    std::string name,
    double time )
```

Default constructor

Parameters

<i>name</i>	Initial model name
<i>time</i>	Initial model time

Returns

[Model](#) with initial name and time

4.4.1.3 ModelImplementation() [2/2]

```
ModelImplementation::ModelImplementation (
    const ModelImplementation & model )
```

Copy constructor

Parameters

<i>model</i>	Model to copy from
--------------	------------------------------------

Returns

Copied model

4.4.2 Member Function Documentation**4.4.2.1 add() [1/2]**

```
void ModelImplementation::add (
    Flow * flow ) [override], [virtual]
```

Add a flow to the model

Parameters

<i>flow</i>	Flow to be added to the model
-------------	---

Implements [Model](#).

4.4.2.2 add() [2/2]

```
void ModelImplementation::add (
```

```
System * system ) [override], [virtual]
```

Add a system to the model

Parameters

<i>system</i>	System to be added to the model
---------------	---

Implements [Model](#).

4.4.2.3 getName()

```
std::string ModelImplementation::getName ( ) const [override], [virtual]
```

Get model name

Implements [Model](#).

4.4.2.4 getTime()

```
double ModelImplementation::getTime ( ) const [override], [virtual]
```

Get model time

Implements [Model](#).

4.4.2.5 operator=()

```
ModelImplementation & ModelImplementation::operator= (
    const ModelImplementation & model )
```

Copy Assignment Operator

Parameters

<i>model</i>	Model to copy from
--------------	------------------------------------

Returns

Copied model

4.4.2.6 setName()

```
void ModelImplementation::setName (
    std::string n ) [override], [virtual]
```

Set model name

Parameters

<i>n</i>	Name for the system
----------	---------------------

Implements [Model](#).

4.4.2.7 setTime()

```
void ModelImplementation::setTime (
    std::string t ) [override], [virtual]
```

Set model time

Parameters

<i>t</i>	Name for the system
----------	---------------------

Implements [Model](#).

4.4.2.8 simulate()

```
void ModelImplementation::simulate (
    double start,
    double end,
    double timestep ) [override], [virtual]
```

Simulates the model during a period of time between start and end time values with a specified timestep

Parameters

<i>start</i>	Time where the simulation starts
<i>end</i>	Time where the simulation ends
<i>timestep</i>	Timestep value to simulate with

Implements [Model](#).

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

- /home/joaozenobio/CLionProjects/Eng1/src/lib/ModelImplementation.h
- /home/joaozenobio/CLionProjects/Eng1/src/lib/ModelImplementation.cpp

4.5 System Class Reference

Inheritance diagram for System:

Public Member Functions

- virtual std::string [getName](#) () const =0
- virtual void [setName](#) (std::string)=0
- virtual double [getValue](#) () const =0
- virtual void [setValue](#) (double)=0

4.5.1 Member Function Documentation

4.5.1.1 [getName\(\)](#)

```
virtual std::string System::getName ( ) const [pure virtual]
```

Implemented in [SystemImplementation](#).

4.5.1.2 [getValue\(\)](#)

```
virtual double System::getValue ( ) const [pure virtual]
```

Implemented in [SystemImplementation](#).

4.5.1.3 [setName\(\)](#)

```
virtual void System::setName (  
    std::string ) [pure virtual]
```

Implemented in [SystemImplementation](#).

4.5.1.4 [setValue\(\)](#)

```
virtual void System::setValue (  
    double ) [pure virtual]
```

Implemented in [SystemImplementation](#).

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

- /home/joaozenobio/CLionProjects/Eng1/src/lib/System.h

4.6 SystemImplementation Class Reference

Inheritance diagram for SystemImplementation:

Collaboration diagram for SystemImplementation:

Public Member Functions

- [~SystemImplementation](#) () override
- [SystemImplementation](#) (std::string name, double value)
- [SystemImplementation](#) (const [SystemImplementation](#) &system)
- [SystemImplementation](#) & [operator=](#) (const [SystemImplementation](#) &system)
- std::string [getName](#) () const override
- void [setName](#) (std::string n) override
- double [getValue](#) () const override
- void [setValue](#) (double v) override

Protected Attributes

- std::string **name**
- double **value**

4.6.1 Constructor & Destructor Documentation

4.6.1.1 ~SystemImplementation()

```
SystemImplementation::~SystemImplementation ( ) [override], [default]
```

Default destructor

4.6.1.2 SystemImplementation() [1/2]

```
SystemImplementation::SystemImplementation (
    std::string name,
    double value )
```

Default constructor

Parameters

<i>name</i>	Initial system name
<i>value</i>	Initial system value

Returns

[System](#) with initial name and value

4.6.1.3 SystemImplementation() [2/2]

```
SystemImplementation::SystemImplementation (
    const SystemImplementation & system )
```

Copy constructor

Parameters

<i>system</i>	System to copy from
---------------	-------------------------------------

Returns

Copied system

4.6.2 Member Function Documentation**4.6.2.1 getName()**

```
std::string SystemImplementation::getName ( ) const [override], [virtual]
```

Get system name

Implements [System](#).

4.6.2.2 getValue()

```
double SystemImplementation::getValue ( ) const [override], [virtual]
```

Get system value

Implements [System](#).

4.6.2.3 operator=()

```
SystemImplementation & SystemImplementation::operator= (
    const SystemImplementation & system )
```

Copy Assignment Operator

Parameters

<i>system</i>	System to copy from
---------------	-------------------------------------

Returns

Copied system

4.6.2.4 setName()

```
void SystemImplementation::setName (
    std::string n )    [override], [virtual]
```

Set system name

Parameters

<i>n</i>	Name for the system
----------	---------------------

Implements [System](#).

4.6.2.5 setValue()

```
void SystemImplementation::setValue (
    double v )    [override], [virtual]
```

Set system value

Parameters

<i>v</i>	Value for the system
----------	----------------------

Implements [System](#).

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

- /home/joaozenobio/CLionProjects/Eng1/src/lib/SystemImplementation.h
- /home/joaozenobio/CLionProjects/Eng1/src/lib/SystemImplementation.cpp

Chapter 5

File Documentation

5.1 Flow.h

```
1 //
2 // Created by joaozenobio on 27/04/2022.
3 //
4
5 #ifndef ENGL_FLOW_H
6 #define ENGL_FLOW_H
7
8 #include <string>
9
10 #include "System.h"
11
12 class Flow {
13 public:
14     virtual ~Flow() = default;
15     virtual std::string getName() const = 0;
16     virtual void setName(std::string) = 0;
17     virtual double getValue() const = 0;
18     virtual void setValue(double) = 0;
19     virtual void expression() = 0;
20     virtual System* getSystemBegin() const = 0;
21     virtual void setSystemBegin(System*) = 0;
22     virtual System* getSystemEnd() const = 0;
23     virtual void setSystemEnd(System*) = 0;
24 };
25
26
27 #endif //ENGL_FLOW_H
```

5.2 FlowImplementation.h

```
1 //
2 // Created by joaozenobio on 28/04/2022.
3 //
4
5 #ifndef ENGL_FLOWIMPLEMENTATION_H
6 #define ENGL_FLOWIMPLEMENTATION_H
7
8
9 #include "Flow.h"
10
11
12 class FlowImplementation : public Flow {
13 protected:
14     std::string name;
15     double value;
16     System* systemBegin;
17     System* systemEnd;
18 public:
19     ~FlowImplementation() override;
20
21     FlowImplementation(std::string name, double value, System* systemBegin, System* systemEnd);
22
23     FlowImplementation(const FlowImplementation& flow);
24
25     FlowImplementation& operator=(const Flow& flow);
26
27 }
```

```

49
53     void expression() override = 0;
54
58     std::string getName() const override;
59
64     void setName(std::string n) override;
65
69     double getValue() const override;
70
75     void setValue(double v) override;
76
80     System* getSystemBegin() const override;
81
86     void setSystemBegin(System* system) override;
87
91     System* getSystemEnd() const override;
92
97     void setSystemEnd(System* system) override;
98 };
99
100
101 #endif //ENGL_FLOWIMPLEMENTATION_H

```

5.3 Model.h

```

1 //
2 // Created by joaozenobio on 27/04/2022.
3 //
4
5 #ifndef ENGL_MODEL_H
6 #define ENGL_MODEL_H
7
8
9 #include <vector>
10 #include <string>
11
12 #include "System.h"
13 #include "Flow.h"
14
15 class Model {
16 public:
17     virtual ~Model() = default;
18     virtual void simulate(double, double, double) = 0;
19     virtual std::string getName() const = 0;
20     virtual void setName(std::string) = 0;
21     virtual double getTime() const = 0;
22     virtual void setTime(std::string) = 0;
23     virtual void add(System*) = 0;
24     virtual void add(Flow*) = 0;
25 };
26
27
28 #endif //ENGL_MODEL_H

```

5.4 ModelImplementation.h

```

1 //
2 // Created by joaozenobio on 28/04/2022.
3 //
4
5 #ifndef ENGL_MODELIMPLEMENTATION_H
6 #define ENGL_MODELIMPLEMENTATION_H
7
8
9 #include "Model.h"
10
11 class ModelImplementation: public Model {
12 protected:
13     std::string name;
14     double time;
15     std::vector<System*> systems;
16     std::vector<Flow*> flows;
17 public:
21     ~ModelImplementation() override;
22
29     ModelImplementation(std::string name, double time);
30
36     ModelImplementation(const ModelImplementation& model);
37

```

```

43     ModelImplementation& operator=(const ModelImplementation& model);
44
51     void simulate(double start, double end, double timestep) override;
52
56     std::string getName() const override;
57
62     void setName(std::string n) override;
63
67     double getTime() const override;
68
73     void setTime(std::string t) override;
74
79     void add(System* system) override;
80
85     void add(Flow* flow) override;
86 };
87
88
89 #endif //ENGL_MODELIMPLEMENTATION_H

```

5.5 System.h

```

1 //
2 // Created by joaozenobio on 27/04/2022.
3 //
4
5 #ifndef ENGL_SYSTEM_H
6 #define ENGL_SYSTEM_H
7
8 #include <string>
9
10 class System {
11 public:
12     virtual ~System() = default;
13     virtual std::string getName() const = 0;
14     virtual void setName(std::string) = 0;
15     virtual double getValue() const = 0;
16     virtual void setValue(double) = 0;
17 };
18
19
20 #endif //ENGL_SYSTEM_H

```

5.6 SystemImplementation.h

```

1 //
2 // Created by joaozenobio on 28/04/2022.
3 //
4
5 #ifndef ENGL_SYSTEMIMPLEMENTATION_H
6 #define ENGL_SYSTEMIMPLEMENTATION_H
7
8 #include "System.h"
9
10 class SystemImplementation : public System {
11 protected:
12     std::string name;
13     double value;
14 public:
15     ~SystemImplementation() override;
16
17     SystemImplementation(std::string name, double value);
18
19     SystemImplementation(const SystemImplementation& system);
20
21     SystemImplementation& operator=(const SystemImplementation& system);
22
23     std::string getName() const override;
24
25     void setName(std::string n) override;
26
27     double getValue() const override;
28
29     void setValue(double v) override;
30 };
31
32
33 #endif //ENGL_SYSTEMIMPLEMENTATION_H

```


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