A School Directory Application

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39

Chapter 1

Hierarchical Index

1.1 Class Hierarchy

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

Entry	
Faculty	
Staff	
Student	
SchoolDirectory	

2 Hierarchical Index

Chapter 2

Class Index

2.1 Class List

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

у	7
ulty	13
oolDirectory	17
f	2(
lent de la companya	2

4 Class Index

Chapter 3

File Index

3.1 File List

Here is a list of all files with brief descriptions:

Entry.cpp .																										29
Entry.h									 																	30
Faculty.cpp									 																	31
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SchoolDirect	tory	y.c	pp						 																	33
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6 File Index

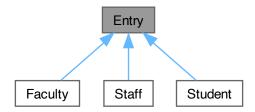
Chapter 4

Class Documentation

4.1 Entry Class Reference

#include <Entry.h>

Inheritance diagram for Entry:



Public Member Functions

- Entry ()
- Entry (std::string first, std::string last, std::string eAddress)
- bool equals (std::string first, std::string second)
- bool equals (Entry otherEntry)
- bool comesBefore (std::string first, std::string second)
- bool comesBefore (Entry otherEntry)
- virtual std::ostream & print (std::ostream &os) const
- virtual \sim Entry ()

Friends

std::ostream & operator<< (std::ostream &os, const Entry &ent)

4.1.1 Detailed Description

```
Remarks
```

Entry: a base class for entries within a School Directory * A base entry holds a first name, last name, and email address *

•

Base capabilities include: * Base constructors * Comparison operations depend upon last names, then first names * Formatted output *

.

: files include header (Entry.h) and Implementation (Entry.cpp) *

•

Uncomment a main program for unit testing *

•

Author

```
Henry M. Walker *
```

Date

January 11, 2023 *

•

Remarks

References *

A School Directory as an Example of Object-Oriented Design * http://localhost/courses/cpp-style-guide/cphp *

•

4.1.2 Constructor & Destructor Documentation

4.1.2.1 Entry() [1/2]

Entry::Entry ()

Remarks

Default constructor (with no parameters) *

Remarks

Entry: a base class for entries within a School Directory * A base entry holds a first name, last name, and email address *

•

Base capabilities include: * Base constructors * Comparison operations depend upon last names, then first names * Formatted output *

•

: files include header (Entry.h) and Implementation (Entry.cpp) *

•

Uncomment a main program for unit testing *

•

Author

Henry M. Walker *

Date

```
January 11, 2023 \ast
```

Remarks

References *

A School Directory as an Example of Object-Oriented Design * http://localhost/courses/cpp-style-guide/cphp *

Default constructor (with no parameters) *

4.1.2.2 Entry() [2/2]

```
Entry::Entry (
         std::string first,
         std::string last,
         std::string eAddress )
```

Remarks

Full-parameter constructor *

•

Parameters

first	a person's first name *
last	a person's last name *
eAddress	a person's email address *
	•

4.1.2.3 ∼Entry()

```
Entry::~Entry ( ) [virtual]
```

Remarks

```
a Default destructor * identify as virtual, since Entry has virtual functions *
```

Remarks

a Default descructor *

4.1.3 Member Function Documentation

4.1.3.1 comesBefore() [1/2]

Remarks

check if this object comes before the parameter object *

•

Parameters

an entry to be compared with this object *
•
ć

Returns

true if Entry's first/last names come before parameter's names * in directory order *

4.1.3.2 comesBefore() [2/2]

Remarks

check if this object comes before the given first/last names *

•

Parameters

first	a person's first name *
last	a person's last name *
	•

Returns

true if Entry's first/last names come before parameter names * in directory order *

Here is the caller graph for this function:



4.1.3.3 equals() [1/2]

```
bool Entry::equals (
            Entry otherEntry )
```

Remarks

check whether first and last names or two Entries match *

Parameters

otherEntry	an entry to be compared with this object *
otherEntry	an entry to be compared with this object st

Returns

true if this Entr'sy names match those of the parameter *

Remarks

check if this object comes before the given first/last names *

Parameters

first	a person's first name *
last	a person's last name *

Returns

true if Entry's first/last names come before parameter names * in directory order *

4.1.3.4 equals() [2/2]

```
bool Entry::equals (
            std::string first,
            std::string second )
```

Remarks

check whether first and last name of an Entry match two strings*

Parameters

first	a person's first name *
last	a person's last name *

Returns

true if Entry names match first and last name strings \ast

•

Here is the caller graph for this function:



4.1.3.5 print()

Remarks

output a format Entry object *

Parameters

os output stream which will receive the formatted Entry data *

- @ewmrk by being a virtual function, implementations in subclasses \ast will be interpreted via polymorphism \ast

_

Returns

formatted string on the given output stream \ast

•

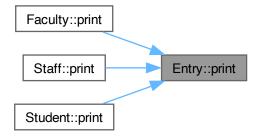
Remarks

use of a to_string function with a string return type * would require allocating space for a long string, * yielding a potential memory leak *

•

Reimplemented in Faculty, Staff, and Student.

Here is the caller graph for this function:



4.1.4 Friends And Related Function Documentation

4.1.4.1 operator<<

Remarks

```
overload << for printing an Entry *
```

•

use of the virtual print method allows tailored output * by subclasses *

•

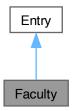
The documentation for this class was generated from the following files:

- Entry.h
- Entry.cpp

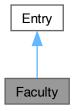
4.2 Faculty Class Reference

```
#include <Faculty.h>
```

Inheritance diagram for Faculty:



Collaboration diagram for Faculty:



Public Member Functions

- Faculty (std::string first, std::string last, std::string addr, std::string room, int ext, std::string department, int yr)
- virtual std::ostream & print (std::ostream &os) const

Public Member Functions inherited from Entry

- Entry ()
- Entry (std::string first, std::string last, std::string eAddress)
- bool equals (std::string first, std::string second)
- bool equals (Entry otherEntry)
- · bool comesBefore (std::string first, std::string second)
- bool comesBefore (Entry otherEntry)
- virtual std::ostream & print (std::ostream &os) const
- virtual ∼Entry ()

4.2.1 Detailed Description

Remarks

Faculty: a class derived from Entry for a School Directory * faculty entry * inherits a first name, last name, and email address from Entry * additional fields are the faculty member's office, extension, * department, and year of initial aappointment to the school *

•

Inherited capabilities include: * Base constructors * Comparison operations depend upon last names, then first names * Formatted orubt abd output *

•

Overwritten capabilities include: * Multi-parameter constructor * Formatted print method *

•

: files include header (Faculty.h), Implementation (Faculty.cpp)*

•

Uncomment a main program for unit testing *

•

Author

Henry M. Walker *

Date

January 11, 2023 *

•

Remarks

References *

A School Directory as an Example of Object-Oriented Design * http://localhost/courses/cpp-style-guide/cphp *

•

4.2.2 Constructor & Destructor Documentation

4.2.2.1 Faculty()

```
Faculty::Faculty (
    std::string first,
    std::string last,
    std::string addr,
    std::string room,
    int ext,
    std::string department,
    int yr )
```

Remarks

Full-parameter constructor *

•

Parameters

first	a faculty member's first name *
last	a faculty member's last name *
eAddress	a faculty member's email address *
room	a faculty member's office *
ext	the telelphone number extension for the office *
department	the faculty member's [primary] department *
yr	the year of the faculty member's first appointment *
	•

Remarks

Faculty: a class derived from Entry for a School Directory * faculty entry * inherits a first name, last name, and email address from Entry * additional fields are the faculty member's office, extension, * department, and year of initial aappointment to the school *

•

Inherited capabilities include: * Base constructors * Comparison operations depend upon last names, then first names * Formatted orubt abd output *

•

Overwritten capabilities include: * Multi-parameter constructor * Formatted print method *

•

: files include header (Faculty.h), Implementation (Faculty.cpp)*

•

Uncomment a main program for unit testing *

•

Author

```
Henry M. Walker *
```

Date

January 11, 2023 *

•

Remarks

References *

A School Directory as an Example of Object-Oriented Design * http://localhost/courses/cpp-style-guide/cphp *

Full-parameter constructor *

•

Parameters

first	a faculty member's first name *	
last	a faculty member's last name *	
eAddress	a faculty member's email address *	
room	a faculty member's office *	
ext	the telelphone number extension for the office *	
department	the faculty member's [primary] department *	
yr	the year of the faculty member's first appointment *	

4.2.3 Member Function Documentation

4.2.3.1 print()

Remarks

output a format Faculty object *

•

Parameters

os output stream which will receive the formatted Faculty data *

• @ewmrk by being a virtual function, implementations in subclasses * will be interpreted via polymorphism *

Returns

formatted string on the given output stream *

•

Reimplemented from Entry.

Here is the call graph for this function:



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

- · Faculty.h
- Faculty.cpp

4.3 SchoolDirectory Class Reference

Public Member Functions

- SchoolDirectory ()
- void add (Entry person)
- void print ()
- Entry * lookup (std::string first, std::string second)

4.3.1 Detailed Description

```
Remarks
```

```
Example of a School Directory application * Entries take the form of Students, Faculty and Staff *

Example illustrates a class hierarchy * * Base class: Entry * Subclasses: Student, Faculty, Staff *

Each class has a header (.h) and implementation (.cpp) files *

Other features: overwritten << operator and virtual print * *

: file: SchoolDirectory.cpp *

: Author

Henry M. Walker *

Date

January 11, 2023 *

: References *

A School Directory as an Example of Object-Oriented Design * http://localhost/courses/cpp-style-guide/o
```

4.3.2 Constructor & Destructor Documentation

4.3.2.1 SchoolDirectory()

php *

```
SchoolDirectory::SchoolDirectory ( ) [inline]
```

Remarks

Default constructor (with no parameters) *

4.3.3 Member Function Documentation

4.3.3.1 add()

Remarks

```
insert a person into the SchoolDirectory * eirectory entries are maintained in lastname/firstname order *
```

Generated by Doxygen

Parameters

person	the entry to be inserted into the underlying directory *	
	•	

Precondition

entries in the underlying directory are ordered by name *

Postcondition

the underlying directory continues to be ordered by name \ast

Here is the call graph for this function:



Here is the caller graph for this function:



4.3.3.2 lookup()

Remarks

entries in the directory are searched by first and last name \ast

•

Parameters

first	the first name of a person *	
last	the last name of a person *	
	•	

Precondition

the underlying directory is ordered by last/first name *

Returns

if the name is found, a pointer to the entry is returned \ast if the name is not found, NULL is returned \ast

•

Remarks

searching is performed via a binarysearch *

•

Here is the caller graph for this function:



4.3.3.3 print()

void SchoolDirectory::print () [inline]

Remarks

entries in the underlying directory are printed to cout * with beginning and end markers *

•

Here is the caller graph for this function:



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

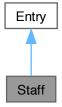
• SchoolDirectory.cpp

4.4 Staff Class Reference

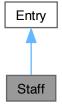
#include <Staff.h>

4.4 Staff Class Reference 21

Inheritance diagram for Staff:



Collaboration diagram for Staff:



Public Member Functions

- Staff (std::string first, std::string last, std::string addr, std::string room, int ext, std::string ttl)
- std::ostream & print (std::ostream &os) const

Public Member Functions inherited from Entry

- Entry ()
- Entry (std::string first, std::string last, std::string eAddress)
- bool equals (std::string first, std::string second)
- bool equals (Entry otherEntry)
- bool comesBefore (std::string first, std::string second)
- bool comesBefore (Entry otherEntry)
- virtual std::ostream & print (std::ostream &os) const
- virtual ∼Entry ()

4.4.1 Detailed Description

Remarks

Student: a class derived from Entry for a School Directory * a staff member's entry * inherits a first name, last name, and email address from Entry * additional fields are the member's office, extension, title *

•

Inherited capabilities include: * Base constructors * Comparison operations depend upon last names, then first names * Formatted orubt abd output *

Overwritten capabilities include: * Multi-parameter constructor * Formatted print method *

: files include header (Staff.h), Implementation (Staff.cpp) *

Uncomment a main program for unit testing \ast

Author

Henry M. Walker *

Date

January 11, 2023 *

•

Remarks

References *

A School Directory as an Example of Object-Oriented Design * http://localhost/courses/cpp-style-guide/cphp *

Full-parameter constructor *

•

Parameters

first	a staff member's first name *	
last	a staff member's last name *	
eAddress	a staff member's email address *	
room	a staff member's office *	
ext	the telelphone number extension for the office *	
title	the staff member's title *	
	•	

4.4.2 Constructor & Destructor Documentation

4.4.2.1 Staff()

4.4 Staff Class Reference 23

```
std::string room,
int ext,
std::string ttl )
```

Remarks

Student: a class derived from Entry for a School Directory * a staff member's entry * inherits a first name, last name, and email address from Entry * additional fields are the member's office, extension, title *

•

Inherited capabilities include: * Base constructors * Comparison operations depend upon last names, then first names * Formatted orubt abd output *

•

Overwritten capabilities include: * Multi-parameter constructor * Formatted print method *

•

: files include header (Staff.h), Implementation (Staff.cpp) *

•

Uncomment a main program for unit testing *

•

Author

```
Henry M. Walker *
```

Date

January 11, 2023 *

•

Remarks

References *

A School Directory as an Example of Object-Oriented Design * http://localhost/courses/cpp-style-guide/cphp *

•

4.4.3 Member Function Documentation

4.4.3.1 print()

Remarks

output a format Faculty object *

•

Parameters

os output stream which will receive the formatted Faculty data *

- @ewmrk by being a virtual function, implementations in subclasses \ast will be interpreted via polymorphism \ast

.

Returns

formatted string on the given output stream *

•

Reimplemented from Entry.

Here is the call graph for this function:

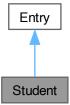


The documentation for this class was generated from the following files:

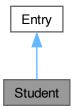
- · Staff.h
- Staff.cpp

4.5 Student Class Reference

#include <Student.h>
Inheritance diagram for Student:



Collaboration diagram for Student:



Public Member Functions

- Student (std::string first, std::string last, std::string addr, int yr, std::string box)
- std::ostream & print (std::ostream &os) const

Public Member Functions inherited from Entry

- Entry ()
- Entry (std::string first, std::string last, std::string eAddress)
- bool equals (std::string first, std::string second)
- bool equals (Entry otherEntry)
- bool comesBefore (std::string first, std::string second)
- bool comesBefore (Entry otherEntry)
- virtual std::ostream & print (std::ostream &os) const
- virtual \sim Entry ()

4.5.1 Detailed Description

Remarks

Student: a class derived from Entry for a School Directory * a student entry * inherits a first name, last name, and email address from Entry * additional fields are the studentr's year and PO Box *

•

Inherited capabilities include: * Base constructors * Comparison operations depend upon last names, then first names * Formatted orubt abd output *

•

Overwritten capabilities include: * Multi-parameter constructor * Formatted print method *

•

: files include header (Student.h), Implementation (Student.cpp)*

•

Uncomment a main program for unit testing *

•

Author

Henry M. Walker *

Date

```
January 11, 2023 *
```

Remarks

References *

A School Directory as an Example of Object-Oriented Design * http://localhost/courses/cpp-style-guide/cphp *

•

4.5.2 Constructor & Destructor Documentation

4.5.2.1 Student()

```
Student::Student (
    std::string first,
    std::string last,
    std::string addr,
    int yr,
    std::string box )
```

Remarks

Full-parameter constructor *

•

Parameters

first	a student's first name *	
last	a student's last name *	
eAddress	a student's email address *	
year	the student's class or expected-graduation year *	
box	the student's campus post office box *	
	_	
	•	

4.5.3 Member Function Documentation

4.5.3.1 print()

Remarks

output a format Faculty object *

•

Parameters

os output stream which will receive the formatted Faculty data *

- @ewmrk by being a virtual function, implementations in subclasses \ast will be interpreted via polymorphism \ast

.

Returns

formatted string on the given output stream \ast

•

Reimplemented from Entry.

Here is the call graph for this function:



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

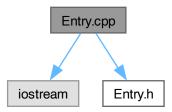
- · Student.h
- Student.cpp

Chapter 5

File Documentation

5.1 Entry.cpp File Reference

#include <iostream>
#include "Entry.h"
Include dependency graph for Entry.cpp:



Functions

- std::ostream & operator<< (std::ostream &os, const Entry &ent)
- int main (

5.1.1 Function Documentation

5.1.1.1 main()

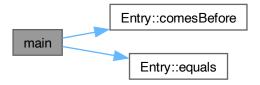
int main ()

30 File Documentation

Remarks

main procedure to control processing r uncomment this procedure for unit testing *

Here is the call graph for this function:



5.1.1.2 operator <<()

Remarks

overload << for printing an Entry *

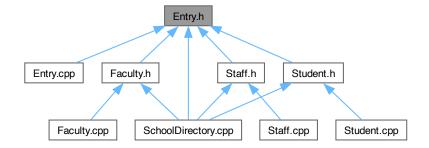
•

use of the virtual print method allows tailored output \ast by subclasses \ast

•

5.2 Entry.h File Reference

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



Classes

· class Entry

5.3 Entry.h 31

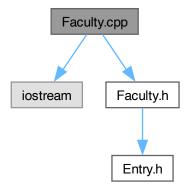
5.3 Entry.h

Go to the documentation of this file.

```
00023 #ifndef ENTRY_H
00024 #define ENTRY_H
00025
00026 class Entry {
00027
00028 public:
00029
        // constructors
00033
        Entry ();
00034
00043
        Entry (std::string first, std::string last, std::string eAddress) ;
00044
00054
        bool equals (std::string first, std::string second);
00055
00064
       bool equals (Entry otherEntry) ;
00065
00075
       bool comesBefore (std::string first, std::string second) ;
00076
00085
        bool comesBefore (Entry otherEntry) ;
00086
00102
00103
          std::ostream& print (std::ostream &os) const;
00104
00112
       friend std::ostream& operator« (std::ostream &os, const Entry& ent) ;
00113
00118
00119
          ~Entry () ;
00120
00121 private:
00122 // cou
       // could use "protected" here, so variables may be accessed in subclasses
00123
        std::string firstName;
        std::string lastName;
00125
        std::string eMail;
00126
00127 };
00128
00129 #endif
```

5.4 Faculty.cpp File Reference

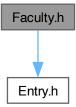
```
#include <iostream>
#include "Faculty.h"
Include dependency graph for Faculty.cpp:
```



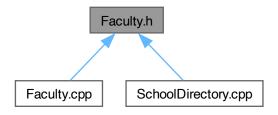
32 File Documentation

5.5 Faculty.h File Reference

#include "Entry.h"
Include dependency graph for Faculty.h:



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



Classes

· class Faculty

5.6 Faculty.h

Go to the documentation of this file.

```
00029 #ifndef FACULTY_H
00030 #define FACULTY_H
00031
00032 #include "Entry.h"
00033
00034 // Directory entries specific to faculty
00035 class Faculty : public Entry {
00036 // Faculty have four special fields
00037
00038 public:
00039
00052
        Faculty (std::string first, std::string last, std::string addr, std::string room,
00053
                    int ext, std::string department, int yr);
00054
00066
         virtual std::ostream& print (std::ostream &os) const;
00067
00068
              // Faculty have four special fields
00069 private:
00070 std::string office;
00071 int extension;
```

```
00072 std::string dept;

00073 int firstYear;

00074

00075 };

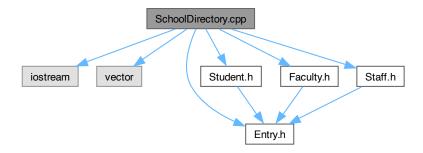
00076

00077 #endif
```

5.7 SchoolDirectory.cpp File Reference

```
#include <iostream>
#include <vector>
#include "Entry.h"
#include "Student.h"
#include "Faculty.h"
#include "Staff.h"
```

Include dependency graph for SchoolDirectory.cpp:



Classes

· class SchoolDirectory

Functions

• int main ()

5.7.1 Function Documentation

5.7.1.1 main()

int main ()

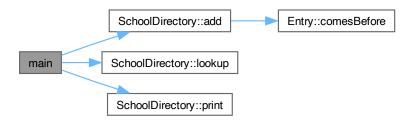
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Remarks

main performs a reasonable level of testing *

•

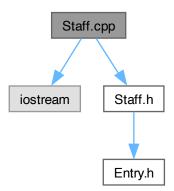
Here is the call graph for this function:



5.8 Staff.cpp File Reference

#include <iostream>
#include "Staff.h"

Include dependency graph for Staff.cpp:

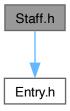


5.9 Staff.h File Reference

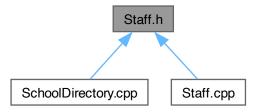
#include "Entry.h"

5.10 Staff.h 35

Include dependency graph for Staff.h:



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



Classes

· class Staff

5.10 Staff.h

Go to the documentation of this file.

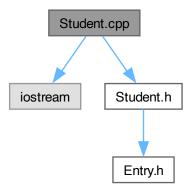
```
00001
00028 #ifndef STAFF_H
00029 #define STAFF_H
00030
00031 #include "Entry.h"
00032
00044 class Staff : public Entry {
00045 public:
00046 Staff
        00047
00048
00060
        std::ostream& print (std::ostream &os) const;
00061
00062 // Staff have two special fields
00063 private:
00064 std::string office;
00065 int extension;
00066 std::string title;
00067
00068 };
00069
00070 #endif
```

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5.11 Student.cpp File Reference

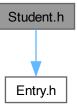
#include <iostream>
#include "Student.h"

Include dependency graph for Student.cpp:



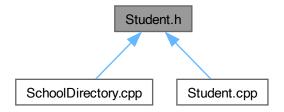
5.12 Student.h File Reference

#include "Entry.h"
Include dependency graph for Student.h:



5.13 Student.h

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



Classes

· class Student

5.13 Student.h

Go to the documentation of this file.

```
00001
00028 #ifndef STUDENT_H
00029 #define STUDENT_H
00030
00031 #include "Entry.h" 00032
00033
00034 class Student : public Entry {
00035 public:
00046
        Student (std::string first, std::string last, std::string addr, int yr, std::string box) ;
00047
00059
        std::ostream& print (std::ostream &os) const;
00060
00061 // Students have two special fields 00062 private: 00063 int year;
        int year;
std::string POBox;
00064
00065
00065
00068 #endif
```

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