Reference Manual

Generated by Doxygen 1.8.13

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Member TEST_CASE ("Question Inheritence Test")

The set_text(), set_answer(), and check_answer() member functions of the base with:
Question: Who was the inventor of C++?
Answer (user-coded):Bjarne Stroustrup

The set_text(), set_answer(), and check_answer() member functions of the base with an incorrect string:
Question: Who was the inventor of C++?
Answer (user-coded): Jack Daniels

The set_text(), set_answer(), and check_answer() member functions of the derived NumericQuestion class with:
Question: Solve this math problem: 36 + 64 = ?
Answer (user-coded): 100

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Question: The inventor of C++ was ________________.
Answer (user-coded):Bjarne Stroustrup

The set_text(), set_answer(), and check_answer() member functions of the derived FillnQuestion class with:
Question: The inventor of C++ was ________________.
Answer (user-coded):Bjarne Stroustrup

2 Hierarchical Index

2.1 Class Hierarchy

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

3 Class Index

3.1 Class List

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

4 File Index

4.1 File List

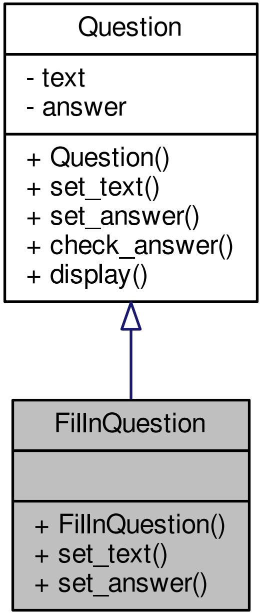
Here is a list of all files with brief descriptions:

5 Class Documentation

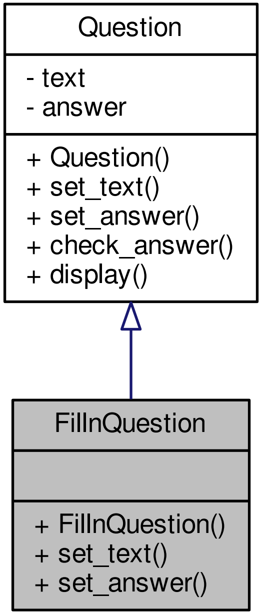
5.1 FillnQuestion Class Reference

```
#include <FillnQuestion.h>
```

Inheritance diagram for FillnQuestion:



Collaboration diagram for FillnQuestion:



Public Member Functions

- FillnQuestion ()
- void set_text (std::string question_text)
- void set_answer (std::string correct_response)

5.1.1 Detailed Description

Definition at line 10 of file FillnQuestion.h.

5.1.2 Constructor & Destructor Documentation

5.1.2.1 FillnQuestion()

```
FillnQuestion::FillnQuestion ( )
```

Constructs a question with empty text and answer.

Definition at line 29 of file FillnQuestion.h.

```
30 {
31
32 }
```

5.1.3 Member Function Documentation

5.1.3.1 set_answer()

```
void FillnQuestion::set_answer (
            std::string correct_response )
```

Parameters

response	the response to check

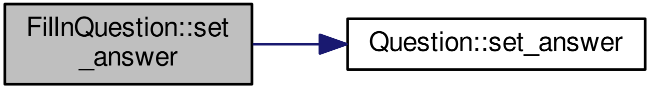
Returns

true if the response was correct, false otherwise

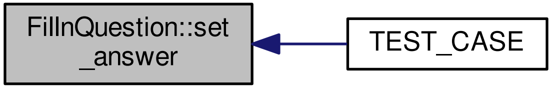
Definition at line 64 of file FillnQuestion.h.

```
{
    Question::set_answer(correct_response);
}
```

Here is the call graph for this function:



Here is the caller graph for this function:



5.1.3.2 set_text()

```
void FillnQuestion::set_text (
            std::string question_text )
```

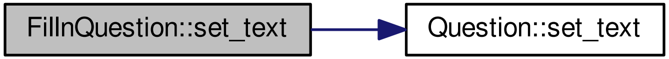
Parameters

question_text	the text of this question

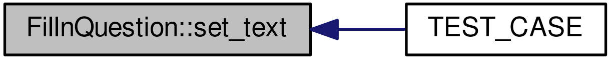
Definition at line 33 of file FillnQuestion.h.

```
{
    int count = 0;
    int count2 = 0;
    std::string question_buffer;
    bool under_score = false;
    for(unsigned int i = 0; i < question_text.size(); i++)
    {
        if(question_text[i] == '_')
        {
            if(under_score == true)
            {
                count2 = i;
                under_score = false;
            }
            else
            {
                under_score = true;
            }
        }
        if(under_score == true)
        {
            count++;
            question_buffer += "_";
        }
    }
    std::string blank_question = question_text.substr(0, count2 - count)
    + question_buffer
    + question_text.substr(count2, question_text.size() - count2);
    Question::set_text(blank_question);
}
```

Here is the call graph for this function:



Here is the caller graph for this function:



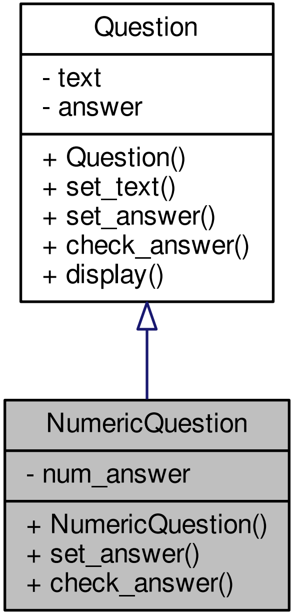
The documentation for this class was generated from the following file:

- FillnQuestion.h

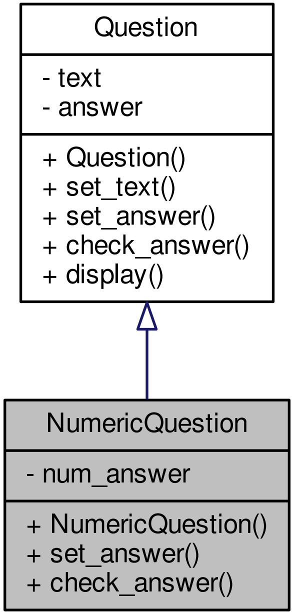
5.2 NumericQuestion Class Reference

```
#include <NumericQuestion.h>
```

Inheritance diagram for NumericQuestion:



Collaboration diagram for NumericQuestion:



Public Member Functions

- NumericQuestion ()
- void set_answer (double correct_response)
- bool check_answer (double response) const

Private Attributes

- double num_answer

5.2.1 Detailed Description

Definition at line 8 of file NumericQuestion.h.

5.2.2 Constructor & Destructor Documentation

5.2.2.1 NumericQuestion()

```
NumericQuestion::NumericQuestion ( )
```

Constructs a NumericQuestion with empty text and answer.

Definition at line 27 of file NumericQuestion.h.

```
28 {
29 }
```

5.2.3 Member Function Documentation

5.2.3.1 check_answer()

```
bool NumericQuestion::check_answer (
            double response ) const
```

Parameters

response	the type double response to check

Returns

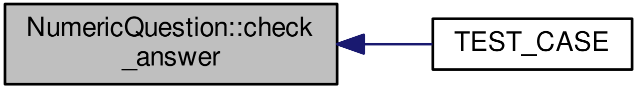
true if the response was correct, false otherwise

Definition at line 35 of file NumericQuestion.h.

```
36 {
37     double max_error = 0.01;
38     double response_error = abs(response - num_answer);
39     if(response_error <= max_error)
40     {
41         std::cout << "Correct!" << std::endl;
42         if(response != num_answer)
43         {
44             std::cout << "Your answer was within the allowed error (0.01)" << std
45             std::cout << "Actual Answer: " << num_answer << std::endl;
46         }
```

```
            return true;
        }
        else
        {
            std::cout << "Incorrect." << std::endl;
            std::cout << "Correct Answer: " << num_answer << std::endl;
            return false;
        }
}
```

Here is the caller graph for this function:



5.2.3.2 set_answer()

```
void NumericQuestion::set_answer (
            double correct_response )
```

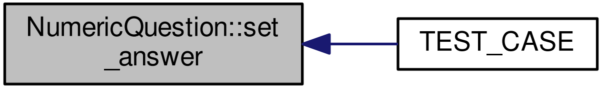
Parameters

correct_response	the double type answer for this question

Definition at line 30 of file NumericQuestion.h.

```
{
    num_answer = correct_response;
}
```

Here is the caller graph for this function:



5.2.4 Member Data Documentation

5.2.4.1 num_answer

```
double NumericQuestion::num_answer  [private]
```

Definition at line 25 of file NumericQuestion.h.

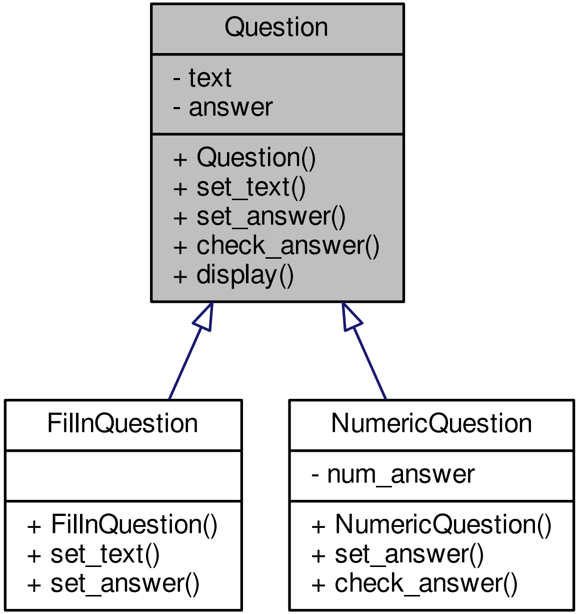
The documentation for this class was generated from the following file:

- NumericQuestion.h

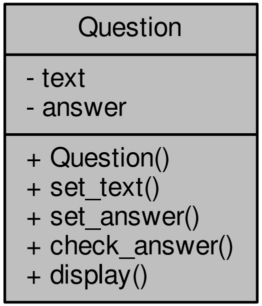
5.3 Question Class Reference

```
#include <question.h>
```

Inheritance diagram for Question:



Collaboration diagram for Question:



Public Member Functions

- Question ()
- void set_text (std::string question_text)
- void set_answer (std::string correct_response)
- bool check_answer (std::string response) const
- void display () const

Private Attributes

- std::string text
- std::string answer

5.3.1 Detailed Description

Definition at line 7 of file question.h.

5.3.2 Constructor & Destructor Documentation

5.3.2.1 Question()

```
Question::Question ( )
```

Constructs a question with empty text and answer.

Definition at line 35 of file question.h.

```
36 {
37 }
```

5.3.3 Member Function Documentation

5.3.3.1 check_answer()

```
bool Question::check_answer (
            std::string response ) const
```

Parameters

response	the response to check

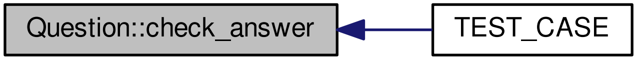
Returns

true if the response was correct, false otherwise

Definition at line 48 of file question.h.

```
{
    if(response == answer)
    {
        std::cout << "Correct!" << std::endl;
        return true;
    }
    else
    {
        std::cout << "Incorrect" << std::endl;
        std::cout << "Correct Answer: " << answer << std::endl;
        return false;
    }
}
```

Here is the caller graph for this function:



5.3.3.2 display()

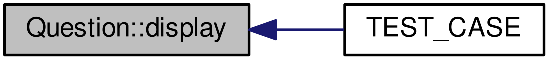
`void Question::display ( ) const`

Displays this question.

Definition at line 63 of file question.h.

```
{
    std::cout << text << std::endl;
}
```

Here is the caller graph for this function:



5.3.3.3 set_answer()

```
void Question::set_answer (
            std::string correct_response )
```

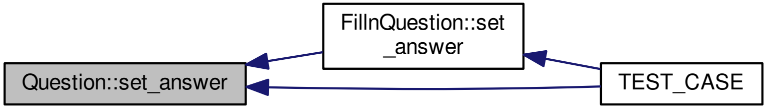
Parameters

correct_response	the answer for this question

Definition at line 43 of file question.h.

```
{
    answer = correct_response;
}
```

Here is the caller graph for this function:



5.3.3.4 set_text()

```
void Question::set_text (
             std::string question_text )
```

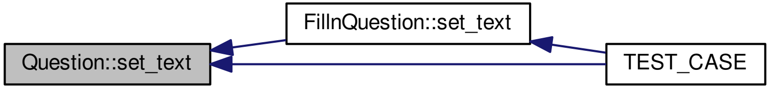
Parameters

question_text	the text of this question

Definition at line 38 of file question.h.

```
{
    text = question_text;
}
```

Here is the caller graph for this function:



5.3.4 Member Data Documentation

5.3.4.1 answer

```
std::string Question::answer  [private]
```

Definition at line 33 of file question.h.

5.3.4.2 text

```
std::string Question::text  [private]
```

Definition at line 32 of file question.h.

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

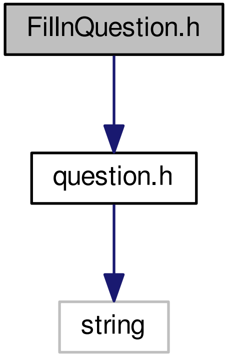
- question.h

6 File Documentation

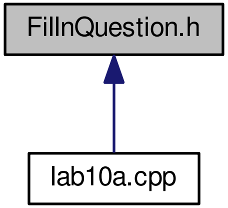
6.1 FillnQuestion.h File Reference

```
#include "question.h"
```

Include dependency graph for FillnQuestion.h:



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



Classes

- class FillInQuestion

Macros

- #define FILLINQUESTION_H

6.1.1 Detailed Description

Such a question is constructed with a string that contains the answer, surrounded by _ _, for example, "The inventor of C++ was _Bjarne Stroustrup_". The question should be displayed as The inventor of C++ was ____________________________.

6.1.2 Macro Definition Documentation

6.1.2.1 FILLINQUESTION_H

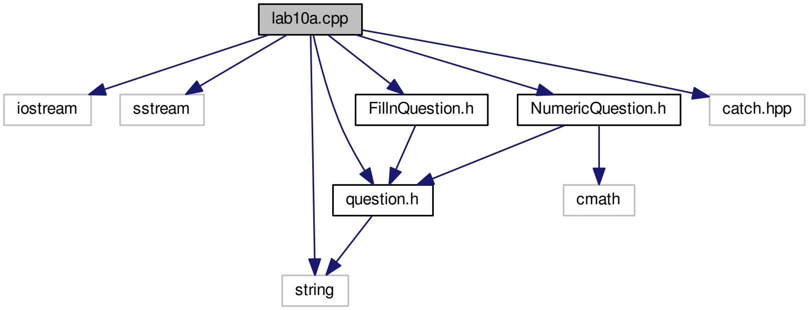
```
#define FILLINQUESTION_H
```

Definition at line 2 of file FillnQuestion.h.

6.2 lab10a.cpp File Reference

```
#include <iostream>
#include <sstream>
#include <string>
#include "question.h"
#include "NumericQuestion.h"
#include "FillnQuestion.h"
#include "catch.hpp"
```

Include dependency graph for lab10a.cpp:



Functions

- TEST_CASE ("Question Inheritence Test")

6.2.1 Function Documentation

6.2.1.1 TEST_CASE()

```
TEST_CASE (
              "Question Inheritence Test"  )
```

Test the base Question class, and 2 derived classes (Numeric and Fill in type)

Test The set_text(), set_answer(), and check_answer() member functions of the base with:
Question: Who was the inventor of C++?
Answer (user-coded):Bjarne Stroustrup

Returns

the question and a boolean value if the answer was correct or not (1 = true and 0 = false)
This test will return:
Who was the inventor of C++?
Your answer: Bjarne Stroustrup
Correct!
1

```
lab10a.cpp:45: passed: ss.str() == "Who was the inventor of C++?\n" "Your answer: Bjarne Stroustrup\n" "Correct!\n" "1\n"
Your answer: Bjarne Stroustrup
Correct!
1
"
==
"Who was the inventor of C++?
Your answer: Bjarne Stroustrup
Correct!
1
"
Passed 1 test case with 1 assertion.
```

Test The set_text(), set_answer(), and check_answer() member functions of the base with an incorrect string:
Question: Who was the inventor of C++?
Answer (user-coded): Jack Daniels

Returns

the question and a boolean value if the answer was correct or not (1 = true and 0 = false)
This test will return:
Who was the inventor of C++?
Your answer: Jack Daniels
Incorrect!
Correct Answer: Bjarne Stroustrup
0

```
lab10a.cpp:75: passed: ss.str() == "Who was the inventor of C++?\n" "Your answer: Jack Daniels\n" "Incorrect\n" "Correct
Your answer: Jack Daniels
Incorrect
Correct Answer: Bjarne Stroustrup
0
"
==
"Who was the inventor of C++?
Your answer: Jack Daniels
Incorrect
Correct Answer: Bjarne Stroustrup
0
"
Passed 1 test case with 1 assertion.
```

Test The set_text(), set_answer(), and check_answer() member functions of the derived NumericQuestion class with:
Question: Solve this math problem: 36 + 64 = ?
Answer (user-coded): 100

Returns

the question, both a string indicating correct/incorrect and a boolean value if the answer was correct or not (1 = true and 0 = false)

This test will return:

Solve this math problem:

36 + 64 = ?

Your answer: 100

Correct!

1

```
lab10a.cpp:73: passed: ss.str() == "Solve this math problem: \n36 + 64 = ?\n" "Your answer: 100\n" "Correct!\n" "1\n" for
36 + 64 = ?
Your answer: 100
Correct!
1
"
==
"Solve this math problem:
36 + 64 = ?
Your answer: 100
Correct!
1
"
Passed 1 test case with 1 assertion.
```

Test The set_text(), set_answer(), and check_answer() member functions of the derived NumericQuestion class with a value that is within 0.01 error of the answer:

Question: Solve this math problem: 36 + 64 = ?

Answer (user-coded): 99.999

Returns

the question, both a string indicating correct/incorrect and a boolean value if the answer was correct or not (1 = true and 0 = false)

This test will return:

Solve this math problem:

36 + 64 = ?

Your answer: 99.999

Correct!
Your answer was within the allowed error (0.01)
Actual Answer: 100
1

```
lab10a.cpp:105: passed: ss.str() == "Solve this math problem: \n36 + 64 = ?\n" "Your answer: 99.999\n" "Correct!\n" "Your
36 + 64 = ?
Your answer: 99.999
Correct!
Your answer was within the allowed error (0.01)
Actual Answer: 100
1
"
==
"Solve this math problem:
36 + 64 = ?
Your answer: 99.999
Correct!
Your answer was within the allowed error (0.01)
Actual Answer: 100
1
"
Passed 1 test case with 1 assertion.
```

Test The set_text(), set_answer(), and check_answer() member functions of the derived NumericQuestion class with an incorrect value:
Question: Solve this math problem: 36 + 64 = ?
Answer (user-coded): 12

Returns

the question, both a string indicating correct/incorrect and a boolean value if the answer was correct or not (1 = true and 0 = false)
This test will return:
Solve this math problem:
36 +64 = ?
Your answer: 12
Incorrect
Correct Answer: 100
0

```
lab10a.cpp:135: passed: ss.str() == "Solve this math problem: \n36 + 64 = ?\n" "Your answer: 12\n" "Incorrect.\n" "Correc
36 + 64 = ?
Your answer: 12
Incorrect.
Correct Answer: 100
0
"
==
"Solve this math problem:
36 + 64 = ?
Your answer: 12
Incorrect.
Correct Answer: 100
0
"
Passed 1 test case with 1 assertion.
```

Test The set_text(), set_answer(), and check_answer() member functions of the derived FillnQuestion class with:
Question: The inventor of C++ was ________________.
Answer (user-coded):Bjarne Stroustrup

Returns

the question and a boolean value if the answer was correct or not (1 = true and 0 = false)
This test will return:
The inventor of C++ is________________.
Your answer: Bjarne Stroustrup
Correct!
1

```
lab10a.cpp:198: passed: ss.str() == "The inventor of C++ was ___________________.\n" "Your answer: Bjarne Stroustrup\n" "
Your answer: Bjarne Stroustrup
Correct!
1
"
==
"The inventor of C++ was ___________________.
Your answer: Bjarne Stroustrup
```

```
Correct!
1
"
Passed 1 test case with 1 assertion.
```

Test The set_text(), set_answer(), and check_answer() member functions of the derived FillnQuestion class with:
Question: The inventor of C++ was ________________.
Answer (user-coded):Bjarne Stroustrup

Returns

the question and a boolean value if the answer was correct or not (1 = true and 0 = false)
This test will return:
The inventor of C++ is________________.
Your answer: Bjarne Stroustrup
Correct!
1

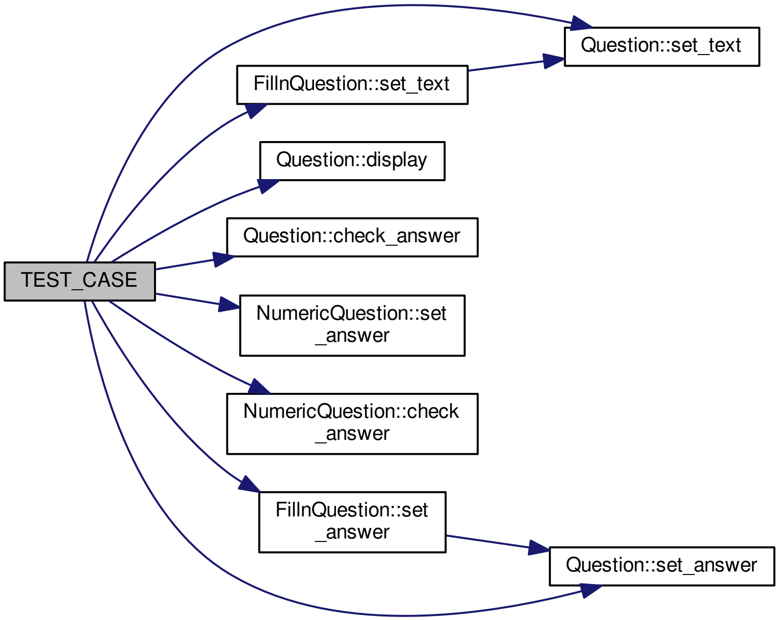
```
lab10a.cpp:226: passed: ss.str() == "The inventor of C++ was ___________________.\n" "Your answer: Morgan Freeman\n" "Inc
Your answer: Morgan Freeman
Incorrect
Correct Answer: Bjarne Stroustrup
0
"
==
"The inventor of C++ was ___________________.
Your answer: Morgan Freeman
Incorrect
Correct Answer: Bjarne Stroustrup
0
"
Passed 1 test case with 1 assertion.
```

Definition at line 11 of file lab10a.cpp.

```
{
    std::string response;
    std::streambuf *b = std::cout.rdbuf();
    std::stringstream ss;
    std::streambuf *sb = ss.rdbuf();
    std::cout.rdbuf(sb);
    SECTION("Question Base Class Test")
    {
        Question q1;
        q1.set_text("Who was the inventor of C++?");
        q1.set_answer("Bjarne Stroustrup");
        q1.display();
        //~ getline(std::cin, response);
        response = "Bjarne Stroustrup";
        std::cout << "Your answer: " << response << std::endl;
        std::cout << q1.check_answer(response) << std::endl;
        CHECK(ss.str() == "Who was the inventor of C++?\n"
                                      "Your answer: Bjarne Stroustrup\n"
                                      "Correct!\n"
                                      "1\n");
    }
    SECTION("Question Base Class Test (Incorrect)")
    {
        Question q1;
        q1.set_text("Who was the inventor of C++?");
        q1.set_answer("Bjarne Stroustrup");
        q1.display();
        //~ getline(std::cin, response);
        response = "Jack Daniels";
        std::cout << "Your answer: " << response << std::endl;
        std::cout << q1.check_answer(response) << std::endl;
        CHECK(ss.str() == "Who was the inventor of C++?\n"
                                      "Your answer: Jack Daniels\n"
                                      "Incorrect\n"
                                      "Correct Answer: Bjarne Stroustrup\n"
                                      "0\n");
    }
    SECTION("Numeric Question Derived Class Test (Correct Answer)")
    {
        NumericQuestion NQ1;
        NQ1.set_text("Solve this math problem: \n36 + 64 = ?");
        NQ1.set_answer(100.0);
        NQ1.display();
        //~ getline(std::cin, response);
        //~ double num_response = std::stod(response,nullptr);
        double num_response = 100.0;
         std::cout << "Your answer: " << num_response << std::endl;
         std::cout << NQ1.check_answer(num_response) << std::endl;
         CHECK(ss.str() == "Solve this math problem: \n36 + 64 = ?\n"
         "Your answer: 100\n"
               "Correct!\n"
               "1\n");
     }
     SECTION("Numeric Question Derived Class Test (Within 0.01)")
     {
         NumericQuestion NQ1;
         NQ1.set_text("Solve this math problem: \n36 + 64 = ?");
         NQ1.set_answer(100.0);
         NQ1.display();
         //~ getline(std::cin, response);
         //~ double num_response = std::stod(response,nullptr);
         double num_response = 99.999;
         std::cout << "Your answer: " << num_response << std::endl;
         std::cout << NQ1.check_answer(num_response) << std::endl;
         CHECK(ss.str() == "Solve this math problem: \n36 + 64 = ?\n"
               "Your answer: 99.999\n"
               "Correct!\n"
               "Your answer was within the allowed error (0.01)\n"
               "Actual Answer: 100\n"
               "1\n");
     }
     SECTION("Numeric Question Derived Class Test (Incorrect)")
     {
         NumericQuestion NQ1;
         NQ1.set_text("Solve this math problem: \n36 + 64 = ?");
         NQ1.set_answer(100.0);
         NQ1.display();

         //~ getline(std::cin, response);
         //~ double num_response = std::stod(response,nullptr);
         double num_response = 12;
         std::cout << "Your answer: " << num_response << std::endl;
         std::cout << NQ1.check_answer(num_response) << std::endl;
         CHECK(ss.str() == "Solve this math problem: \n36 + 64 = ?\n"
              "Your answer: 12\n"
               "Incorrect.\n"
               "Correct Answer: 100\n"
               "0\n");
     }
     SECTION("Fill in Question Derived Class Test")
     {
         FillnQuestion FnQ1;
         FnQ1.set_text("The inventor of C++ was _Bjarne Stroustrup_.");
         FnQ1.set_answer("Bjarne Stroustrup");
         FnQ1.display();
         //~ getline(std::cin, response);
         response = "Bjarne Stroustrup";
         std::cout << "Your answer: " << response << std::endl;
         std::cout << FnQ1.check_answer(response) << std::endl;
         CHECK(ss.str() == "The inventor of C++ was ___________________.\n"
                                       "Your answer: Bjarne Stroustrup\n"
                                       "Correct!\n"
                                       "1\n");
     }
     SECTION("Fill in Question Derived Class Test (Incorrect)")
     {
         FillnQuestion FnQ1;
         FnQ1.set_text("The inventor of C++ was _Bjarne Stroustrup_.");
         FnQ1.set_answer("Bjarne Stroustrup");
         FnQ1.display();
         //~ getline(std::cin, response);
         response = "Morgan Freeman";
         std::cout << "Your answer: " << response << std::endl;
         std::cout << FnQ1.check_answer(response) << std::endl;
         CHECK(ss.str() == "The inventor of C++ was ___________________.\n"
                                       "Your answer: Morgan Freeman\n"
                                       "Incorrect\n"
                                       "Correct Answer: Bjarne Stroustrup\n"
                                       "0\n");
     }
 }
```

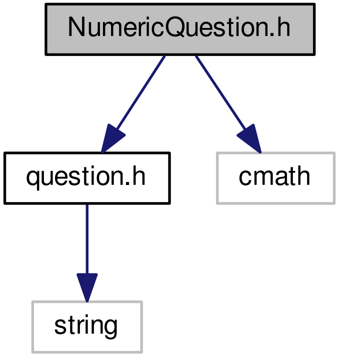
Here is the call graph for this function:



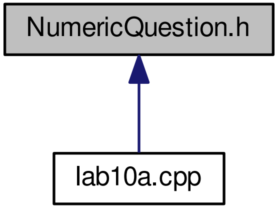
6.3 NumericQuestion.h File Reference

```
#include "question.h"
#include <cmath>
```

Include dependency graph for NumericQuestion.h:



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



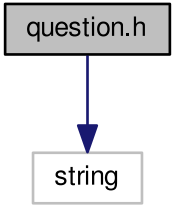
Classes

- class NumericQuestion

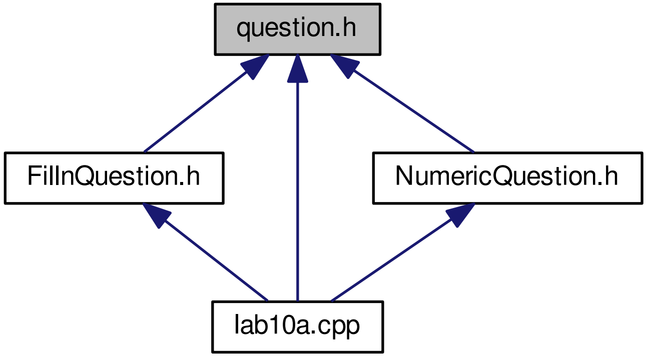
6.4 question.h File Reference

```
#include <string>
```

Include dependency graph for question.h:



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



Classes

- class Question

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