Midterm 2 Study Guide

Due No due date **Points** 25 **Questions** 25 **Time Limit** 30 Minutes **Allowed Attempts** Unlimited

Take the Quiz Again

Attempt History

	Attempt	Time	Score
KEPT	Attempt 7	28 minutes	21 out of 25
LATEST	Attempt 9	29 minutes	20 out of 25
	Attempt 8	29 minutes	20.5 out of 25
	Attempt 7	28 minutes	21 out of 25
	Attempt 6	24 minutes	21 out of 25
	Attempt 5	20 minutes	17.83 out of 25
	Attempt 4	30 minutes	17.67 out of 25
	Attempt 3	22 minutes	16 out of 25
	Attempt 2	16 minutes	16.17 out of 25
	Attempt 1	30 minutes	18.33 out of 25

Correct answers are hidden.

Submitted Jun 28 at 2:30am

Question 2 1 / 1 pts

Match each item with the correct statement below.

Actions that occur after the loop is complete — postcondition

Actions occurring inside the loop's body — operation

Actions that occur before the loop is encountered — precondition

A test the determines if the loop should be entered — bounds

Incorrect

Question 3 0 / 1 pts

Look at the problem statement below. The _____ of the loop is that a period was encountered.

How many characters are in a sentence? Count the characters in a string until a period is encountered. If the string contains any characters, then it will contain a period. Count the period as well.

- ○ bounds
- ○ plan
- ○ None of these
- ◉ goal

Question 4

1 / 1 pts

An ***unguarded*** loop is also known as a ***test-at-the-bottom*** loop.

- ◉ True
- ○ False

Incorrect

Question 5

0 / 1 pts

Below is the illustration from the loop building strategy. The ***highlighted lines*** represent.
Add one to (or increment) the counter variable:

```
Given: the variable str is a string (may be empty)
Create the counter variable, initialized to -1
If the variable str has any characters then
{
    Set counter to 0
    Create the variable current-character as a character
    Place the first character in str into current-character
    While more-characters and current-character not a period
    {
       Add one to (or increment) the counter variable
       Store the next character from str in current-character
    }
    If current-character is a period then
       Add one to the counter to account for the period.
    Else
      Set counter to -2
}
If counter is -1 the string was empty
Else if counter is -2 there was no period
```

- ○ loop bounds
- ○ goal operation
- ○ goal precondition
- ◉ loop postcondition
- ○ bounds precondition
- ○ advancing the loop

Question 6

1 / 1 pts

The highlighted section below illustrates.
Current-character not a period:

```
Given: the variable str is a string (may be empty)
Create the counter variable, initialized to -1
If the variable str has any characters then
{
    Set counter to 0
    Create the variable current-character as a character
    Place the first character in str into current-character
    While more-characters and current-character not a period
    {
       Add one to (or increment) the counter variable
       Store the next character from str in current-character
    }
    If current-character is a period then
       Add one to the counter to account for the period.
    Else
      Set counter to -2
}
If counter is -1 the string was empty
Else if counter is -2 there was no period
```

- ○ a loop guard
- ○ None of these
- ○ a necessary condition
- ◉ an intentional condition
- ○ a boundary condition
- ○ a postcondition

Question 7

1 / 1 pts

Match each item with the correct question below.

What information is produced?	goal precondition
Can my loop reach its bounds?	necessary bounds
How is the data processed?	loop operations or actions
What makes this loop quit?	loop bounds

Question 8

1 / 1 pts

In a ***guarded*** loop, the loop actions may never be executed.

- ◉ True
- ○ False

Question 9

1 / 1 pts

Loop bounds used when searching through input.

- ○ None of these
- ○ data bounds
- ○ limit bounds
- ◉ sentinel bounds

Question 10

1 / 1 pts

What prints here?

```
int i = 5;
while (i) cout << i--;
cout << endl;
```

- Syntax error: `i` is not a Boolean expression
- `54321`
- Infinite loop
- `4321`
- `43210`

Question 11

1 / 1 pts

What prints?

```
void fn(int, double, double&) { cout << "A" << endl; }
void fn(int, int, double&) { cout << "B" << endl; }
void fn(int, int, double) { cout << "C" << endl; }
void fn(int, int, int) { cout << "D" << endl; }

int main()
{
    auto n = 3.5;
    fn(1, 2.5, n);
}
```

- C
- Syntax error: ambiguous
- B
- A
- Syntax error: no candidates
- D

Question 12

1 / 1 pts

What is the output of the following?

```
string s = "12345";
int i = 1;
while (i < 5)
{
    cout << s.substr (i, 1);
    i++;
}
```

- No output
- 2345
- 12345
- 1234

Incorrect

Question 13

0 / 1 pts

Which line in the function "skeleton" below contains an error?

```
#include "digits.h"          // 1.
int firstDigit(int n);       // 2.
{                            // 3.
    return 0;                // 4.
}                            // 5.
```

- [x] // 4.
- [ ] None of these
- [ ] // 3.
- [ ] // 2.
- [ ] // 5.
- [ ] // 1.

Question 14

1 / 1 pts

What is the output of the following?

```
int i = 0;
while (i != 11)
{
    cout << i << " ";
    i = i + 2;
}
```

- [ ] No output
- [x] 0 2 4 6 8 10 12 14 …. (infinite loop)
- [ ] 10 12 14 16 18 …. (infinite loop)
- [ ] 0 2 4 6 8

Question 15

1 / 1 pts

Which prototypes in the following header file contain errors?

```
#ifndef EXAMPLE_H
#define EXAMPLE_H
#include <string>

string f1(int a);
int f2(double);
void f3(std::string& s, int n);
double f4();

#endif
```

- [ ] None of these
- [ ] *f4*
- [ ] *f3*
- [x] *f1*
- [ ] *f2*

Question 16

1 / 1 pts

An ***undeclared*** error message is a compiler error.

- [x] True
- [ ] False

Question 17

1 / 1 pts

What prints here?

```
auto a = 3, b = 3;
cout << (a != b ? "panda": a % 2 ? "stork": "tiger") << endl;
```

- [x] `stork`
- [ ] Does not compile
- [ ] Undefined behavior
- [ ] `panda`
- [ ] `tiger`

Incorrect

Question 18

0 / 1 pts

What does this code do?

```
ifstream in("temp.txt");
char x;
int i{0};
while (in >> x) i++;
cout << i << endl;
```

- [ ] Counts the number of lines in the file
- [ ] Counts the number of words in the file

- Counts the number of digits in the file
- Counts the number of non-space characters in the file
- Gets stuck in an endless loop
- (selected) Counts the number of characters in the file

Question 19

1 / 1 pts

Assume the user types "`brown cow`" when this code runs. What type is `ch2`?

```
char ch1;
auto ch2 = cin.get(ch1);
```

- `char`
- `bool`
- (selected) `istream&`
- `ostream&`
- `int`

Question 20

1 / 1 pts

What does this function do?

```
int mystery(int n)
{
  if (n == 1) return 1;
  return n * mystery(n-1);
}
```

- (selected) Computes the Factorial number n
- Produces a stack overflow
- Computes the Gauss series (sum) of 1..n
- Computes the Fibonacci number n
- Computes the reverse of the input n

Question 21

1 / 1 pts

Counting the number of words in input by counting word transitions is an example of a process filter.

- True
- (selected) False

Question 22

1 / 1 pts

In 1735 Leonard Euler proved a remarkable result, which was the solution to the *Basel Problem*, first posed in 1644 by Pietro Mengoli. This result gave a simple expression for π. The formula states that $\frac{\pi^2}{6}$ is equal to the limit, as *n* goes to infinity, of the series $\frac{1}{1}+\frac{1}{2^2}+\frac{1}{3^2}+...+\frac{1}{n^2}$. Can this series be computed recursively?

- No, because the base case is not zero
- Yes, but the code will be very long
- No, because there is no base case
- Yes

Question 23

1 / 1 pts

Which line runs `a.out` getting its input from `in.txt` and sending its output to the file `out.txt`, and its errors to the file `err.txt`?

- `./a.out >> in.txt > out.txt 2> err.txt`
- `./a.out < in.txt > out.txt 2> err.txt`
- `None of these`
- `./a.out < in.txt 2>&1 out.txt >> err.txt`
- `./a.out > in.txt < out.txt 2> err.txt`
- `./a.out < in.txt > out.txt 2>&1 err.txt`

Question 24

1 / 1 pts

Match each item with the correct statement below.

Has a single `char&` parameter	get()
Returns the last character read to the input stream	unget()
Examines, but does not read the next character in an input stream	peek()
Replaces the last character read with any character	putback()
Called implicitly when an input statement is used as a test condition.	fail()
A predicate function	isalpha()
Converts its value argument to a character and sends it to output.	put()

Question 25

1 / 1 pts

One remarkably simple formula for calculating the value of π is the so-called Madhava–Leibniz series: $\frac{\pi}{4} = 1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\ldots$. Consider the recursive function below to calculate this formula:

```
double computePI(int number)
{
    if (number <= 1) { return 1.0;}
    int oddnum = 2 * number - 1;
    return  computesign(number) * 1.0 / oddnum
        + computePI(number - 1);
}
```

In this recursive function, what is the role of the helper function `computesign`?

- it is called just one time to set the sign of the final result
- it makes sure the sign (positive or negative) alternates as each term of the series is computed
- it is the recursive call in the function
- it checks the sign of the number and returns true if it is positive and false if negative