OLI Assignment 9 due by 9:00pm on Sunday 11/1 via file upload to Cougar Courses

As you read the following OLI pages and complete the interactive activities, capture the screenshots of the completed activities and replace the respective screenshots in the document.

- Page 39 Formatted output
- Page 40 Writing to a data file
- Page 41 A sequence of data
- Page 42 Array analyses

When you are ready to submit the assignment, download the document in PDF and submit the PDF file on Cougar Course as the proof for your work.

Page 39 Formatted output

LBD setw hello

There are five letters in the word "Hello". Given the following output statement

```
cout << setw(3) << "Hello";
```

How many spaces would the statement display before H? 0

✔ Correct! When the width in setw is shorter than to item to be displayed, no space is added.

How many letters of "Hello" will be displayed? 5

✔ Correct! setw does not affect the number of letters we should display "Hello".

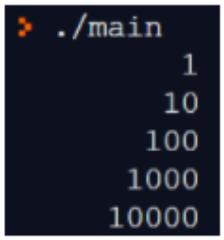
To add 5 spaces before Hello what number should we use to replace _width_ in the following statement?

10

```
cout << setw(_width_) << "Hello";
```

✔ Correct! This would add 5 more spaces before Hello.

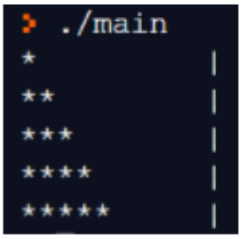
What manipulator should be used to have the numbers lined up on the one's digit as illustrated below?



- ○ left
- ◉ right

✔ Correct

What manipulator should be used to have the output lined up on the first star as illustrated below?



- ○ right
- ◉ left

✔ Correct

Page 40 Writing to a data file

LBD library for file output

Which library header file would we have to include in order to work with ofstream objects?

- ○ <iomanip>
- ◉ <fstream>
- ○ <ofstream>

✔ Correct.

```
ofstream file_input("my_file.txt");
```

Given the above statement, will the new data be added to end of the existing content of the "my_file.txt" file?

- ◉ No
- ○ Yes

✔ Correct, the above statement would actually erase everything in the file.

Hotspot print_loan

Are you able to generate delimited text in the estimates.txt file?

- (•) Yes
- ( ) No

✔ That's great. ×

Please share your challenges and/or tips regarding this task.

None.

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✔ Thanks for sharing. ×

Describe an app that might have saved data of how you have been using the app.

Text messages and how it has certain outputs with autocorrection.

Resubmit

✔ Thanks for sharing. ×

How do you think someone would be able to benefit from analyzing such data?

More specific code leads to better programs

Resubmit

✔ Thanks for sharing. ×

Page 42 A sequence of data

Hotspot declaring array variables

What is the data type for each element of the `costs` array in the above example? double

✔ Correct.

How many consecutive memory units would the compiler give to the `words` array in the above example?

15

✔ Correct.

```
cout << "What is your favorite ice cream flavor?" << endl;
cout << "A. Vanilla" << endl;
cout << "B. Chocolate" << endl;
cout << "C. Strawberry" << endl;
cout << "Enter A - C: ";
```

If we want to collect and store the responses to the above question from up to 100 people. What should we use below as the data type for the elements of the `responses` array?

char responses[100];

✔ Correct, each response is a char value.

In the following box, declare a few array variables. Use descriptive variable names to help others understand what kind of elements are to be stored in these arrays. Specify the number of consecutive units you would like to request from the compiler.

```
int height [12]
string letters [26]
```

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✔ Thank you for sharing.

LBD access highs elements

The first element of the `highs` array has the smallest value. What is its index ? 0

✔ Correct! The first element in array is the smallest.

What is the value of `highs[1]` ?

- 69
- Not available
- 74

✔ Correct. array indices start at 0. Therefore, highs[1] is for Monday and not Sunday.

What is the value of `highs[5]` ? 76

✔ Correct! the last temperature is highs[6] and the second to last is highs[5].

What would the index be if we want to get the last element of the array (78)?

`highs[` 6 `]`

✔ Correct! The last element of an array is indexed by the size of the array minus 1.

What is the value of `highs[7]` ?

- Not available
- 69
- 78

✔ Correct. the last element of the array has is `highs[6]` .

LBD patterns in cout << highs[__]

What index value is used in line 3 to display Sunday's high? 0

✔ Correct!

What index value is used in line 9 to display Saturday's high? 6

✔ Correct!

The difference between lines 3 and 4 is in the index values. The same happens from line 4 to 5, 5 to 6, and so on.

In your own words, describe the pattern of how the index value change from one line to the next.

Increase by one index value.

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✔ Thanks for sharing.

Hotspot display forecast

Step 1: index is set to 0.

Step 2: Evaluate (index < 2). What is the result of the evaluation? true

✔ Correct!

Step 3: since 0 < 2 is true, the program will display highs[index] using 8 spaces. What value would be displayed? 69

✔ Correct! highs[0] is displayed since index is 0.

Step 4: index++ is executed. What would be the new index value? 1

✔ Correct! We have updated index from 0 to 1.

Which of the following should be Step 5?

- int index = 0
- cout << setw(8) << highs[index];
- (●) Evaluate index < 2

✔ Correct. the program always evaluate the loop condition after completing one round of the loop body.

Step 6: since 1 < 2 is true, the program will display highs[index] using 8 spaces. What value would be displayed? 74

✔ Correct!

Which of the following should be Step 7?

- (●) index++
- Evaluate index < 2
- cout << endl;

✔ Correct. the program does not leave the loop body without completing both statements in the body first.

Step 7 updated index from 1 to 2.

Which of the following should be Step 8?

- cout << endl;
- (•) Evaluate index < 2
- cout << setw(8) << highs[index];

✔ Correct. the program always evaluate the loop condition after completing one round of the loop body.

Which of the following should be Step 9?

- (•) cout << endl;
- cout << setw(8) << highs[index];

✔ Correct. the program always evaluate the loop condition after completing one round of the loop body.

All together, how many days of temperature would the above loop display? 2

✔ Correct! The loop displays the temperatures for Sunday and Monday.

The above loop condition uses index < 2 to display the temperatures for Sunday and Monday, what number should replace 2 if we want to display the temperatures for Sunday through Wednesday?

4

✔ Correct! This tells the loop to display highs[3] as the last one.

The same loop structure can be used to collect the low temperatures into the lows array.

```
int index = 0;
while (index < 7) {
  cout << "Enter a temperature: ";
  cin >> _________;   //collect into one element of the lows array
  index++;
}
```

What should we used to replace the _____ in the above code segment?

lows[index]

✔ Correct, this would allow the first user input be stored in `lows[0]`, the second user input be stored in `lows[1]`, and so on.

Page 43 Array analyses

Hotspot equivalent while and for loops

In the following space, convert the above while loop into its equivalent for loop.

```
for (index = 0; index < 7; index++)
```

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```
for (int index = 0; index < 7; index++) {
  cout << "Enter a temperature: "
  cin >> lows[index];
}
```

LBD tracing a for-loop

The first action taken for the loop is

```
int index = 0;
```

What is the next action?

- `cout << words[index];`
- (•) `index < 5`

✔ Correct; the compiler evaluates the loop condition right after initialization.

Since `index < 5` evaluates to `true`, the loop body `cout << words[index];` is executed. What would be displayed? a

✔ Correct! Since index is 0, words[index] is "a".

After the execution of the loop body, what action would occur next?

- index < 5
- index++
- (•) index += 3

✔ Correct, index update occurs right after the loop body

What would be the value of `index` as the result of the above action? 3

✔ Correct!

Since `index < 5` is true, the loop body `cout << words[index];` will be executed. What would be displayed?
cat

✔ Correct! Correct, words[3] is "cat".

After the execution of the loop body, the index update will be executed. What would be the value of `index` as a result
6

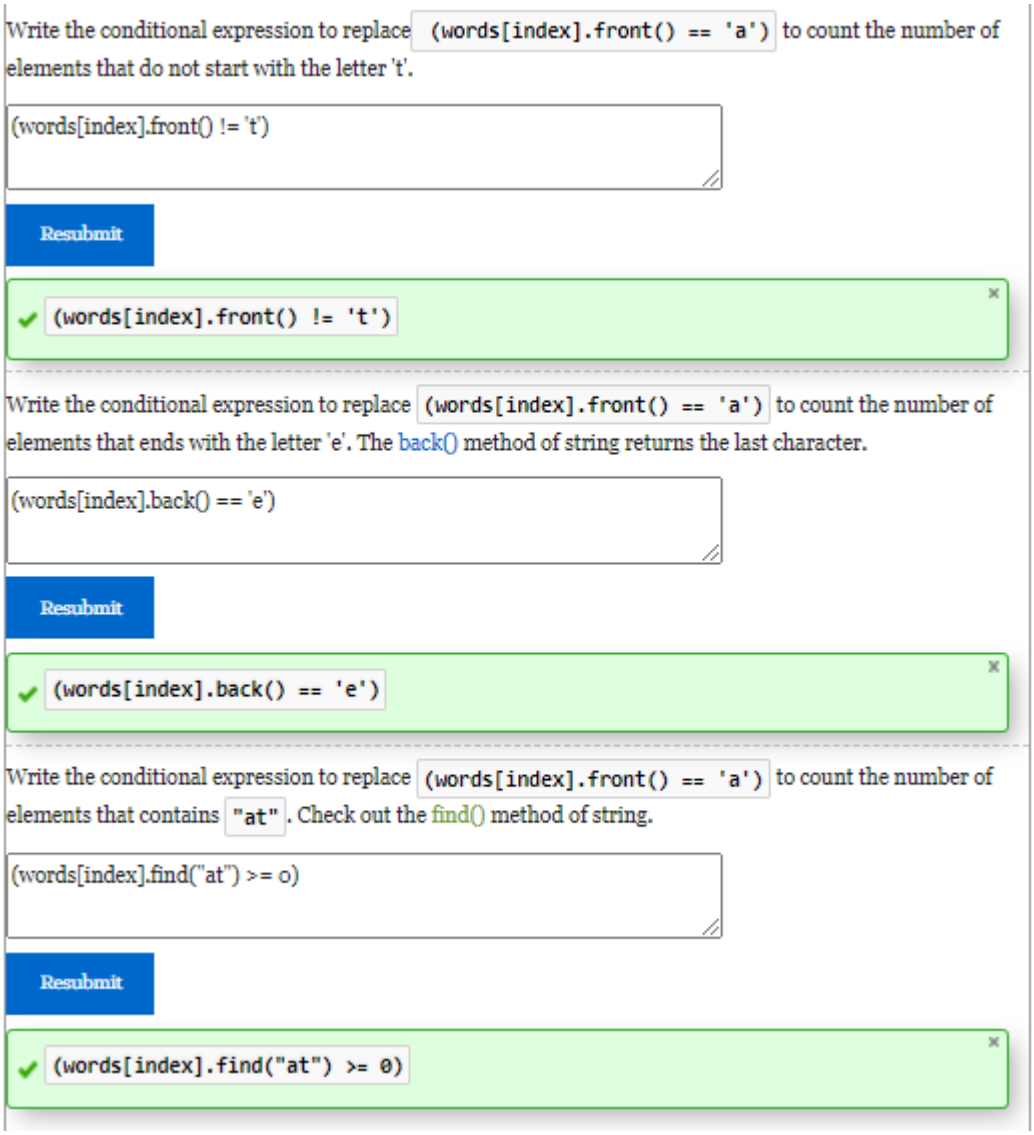
✔ Correct!

What would be executed next?

- `cout << endl;`
- (•) `index < 5`

✔ Correct, Loop condition is always evaluated right after the index update.

Hotspot counting words starting with ‘a’



LBD search for “act”

First, the loop initialization sets `index` to `0`

Then, the compiler evaluates `index < num_words` to determine whether to execute the loop body. What is the result?

true

✔ Correct. `index` is `0` and `num_words` is `5`, `0 < 5` is `true`.

Now the compiler is evaluating `words[index] == str`. What is the result?

- `true`
- `false`

✔ Correct; `words[0]` is `"a"`, which is not the same as `"act"`.

Would the value of `found` be changed to `true` as the result of the above evaluation?

- Yes
- No

✔ Correct. The value of `found` is changed to `true` only when `words[index] == str` is `true`. But `words[0]` is not the same as `str`.

What would be the next step for the compiler?

- Perform index++
- Evaluate index < num_words;
- Evaluate words[index] == str

✔ Correct; index update needs to be performed after each execution of the loop body.

The above step increased `index` from `0` to `1`.

Again, the compiler evaluates `index < num_words` to determine whether to execute the loop body. What is the result?

- `true`
- `false`

✔ Correct. `index` is `1` and `num_words` is `5`, `1 < 5` is `true`.

Now the compiler is evaluating `words[index] == str`. What is the result?

- ○ `false`
- ◉ `true`

✔ Correct; `words[0]` is `"a"`, which is not the same as `"act"`.

Now the compiler is executing the loop body (the conditional statement) for words[1]. Would the value of `found` be changed to `true` as the result?

- ○ No
- ◉ Yes

✔ Correct. The value of `found` is changed to `true` only when `words[index] == str` is `true`. And `words[1]` is the same as `str`.

What would the compiler do after setting found to true?

- ◉ The compiler will continue to compare str with words[2], words[3], and words[4].
- ○ The compiler will stop the loop since it has found a match.

✔ Correct, the compiler does not know the goal of the loop is to find a match. We set up the loop to tell the compiler that it needs to go through all elements in the array.

MR Questions/tips

Please share your questions and/or tips for others regarding arrays.

None.

Resubmit

✔ Thanks for sharing.