COMSC 165

Summer 2020

Programming Assignment 4

Worth 20 points (2% of your grade)

DUE: Wednesday, 7/1/20 by 11:59 P.M. on Canvas

NOTE: Your submission for this assignment should be a single **.cpp** file and a single **.pdf** file. The following naming convention should be used for naming your files: **firstname_lastname_165_assign4.cpp** **and** **firstname_lastname_165_assign4.pdf**. The pdf file that you submit should contain the screenshots of your sample runs of the program (see below). For example, if your first name is "James" and your last name is "Smith", then your files should be named James_Smith_165_assign4.cpp and James_Smith_165_assign4.pdf.

COMMENTS (7.5% of programming assignment grade): Your program should have at least **ten (10)** different detailed comments explaining the different parts of your program. Each individual comment should be, at a minimum, a sentence explaining a particular part of your code. You should make each comment as detailed as necessary to fully explain your code. You should also number each of your comments (i.e., comment 1, comment 2, etc.).

SAMPLE RUNS (7.5% of programming assignment grade): You should submit
screenshots of at least **five (5)** different sample runs of your program. Each sample
run needs to use different inputs, and your sample runs should **NOT** be the same
as the sample runs that are used in this write-up for the assignment. **Each sample
run needs to purposefully include several invalid inputs (the invalid inputs
should be different for each sample run) so I can see your input validation loop
running**. You should also number each of your sample runs (i.e., sample run 1,
sample run 2, etc.). Each of your sample runs should be similar to this format:

```
Please enter the student's answers for each of the questions.
Press Enter after typing each answer.
Please enter only an A, B, C, or D for each question.
Question 1: F
Use only an A, B, C, or D!
Please try again.
Z
Use only an A, B, C, or D!
Please try again.
K
Use only an A, B, C, or D!
Please try again.
A
Question 2: B
Question 3: C
Question 4: D
Question 5: A
Question 6: B
Question 7: C
Question 8: D
Question 9: A
Question 10: B
Question 11: C
```

```
Question 12: D
Question 13: A
Question 14: B
Question 15: C
Question 16: D
Question 17: A
Question 18: B
Question 19: C
Question 20: D


The student failed the exam.

Correct Answers: 3
Incorrect Answers: 17
```

```
Questions that were answered incorrectly:
2
3
4
5
7
8
9
10
11
12
13
15
16
17
18
19
20
```

For your fourth programming assignment you will be writing the following C++ program:

Students in a COMSC 165 class at Diablo Valley College have taken a multiple-choice test that has 20 questions. For each question, the student can choose either 'A', 'B', 'C', or 'D' as their answer. Your program will allow the user to enter the students answers for each question, and then grade their test by comparing the student's answers against the answer key.

Here are the correct answers:

1. A
2. D
3. B
4. B
5. C
6. B
7. A
8. B
9. C
10. D
11. A
12. C
13. D
14. B
15. D
16. C
17. C
18. A
19. D
20. B

Your program should store the correct answers shown above in an **array**. It should ask the user to enter the student's answers for each of the 20 questions, and the answers should be stored in **another array**. After the student's answers have been entered, the program should display a message indicating whether the student passed or failed the exam. (A student must correctly answer 15 of the 20 questions to pass the exam.) It should then display the total number of correctly

answered questions, the total number of incorrectly answered questions, and a list showing the question numbers of the incorrectly answered questions.

Input Validation loop*: Only accept the letters A, B, C, or D as answers.*

NOTE: Functions are **OPTIONAL** for this assignment since this is your first assignment with arrays. However, you are still encouraged to try and incorporate some functions into your program to prepare for future assignments where you will be writing programs that include both arrays and functions (e.g., functions that are passed arrays as arguments). You will also soon be writing programs that read from and write to files as well.

Sample Run 1:

```
Please enter the student's answers for each of the questions.
Press Enter after typing each answer.
Please enter only an A, B, C, or D for each question.
Question 1: C
Question 2: C
Question 3: B
Question 4: B
Question 5: C
Question 6: B
Question 7: A
Question 8: B
Question 9: C
Question 10: D
Question 11: A
Question 12: C
Question 13: D
Question 14: B
Question 15: D
Question 16: C
Question 17: C
Question 18: A
Question 19: D
Question 20: B
```

```
The student passed the exam.

Correct Answers: 18
Incorrect Answers: 2

Questions that were answered incorrectly:
1
2
```

Sample Run 2

```
Please enter the student's answers for each of the questions.
Press Enter after typing each answer.
Please enter only an A, B, C, or D for each question.
Question 1: C
Question 2: C
Question 3: C
Question 4: C
Question 5: C
Question 6: C
Question 7: C
Question 8: C
Question 9: C
Question 10: C
Question 11: C
Question 12: C
Question 13: C
Question 14: C
Question 15: C
Question 16: C
Question 17: C
Question 18: C
Question 19: C
Question 20: C
```

```
The student failed the exam.

Correct Answers: 5
Incorrect Answers: 15

Questions that were answered incorrectly:
1
2
3
4
6
7
8
10
11
13
14
15
18
19
20
```

Sample Run 3:

```
Please enter the student's answers for each of the questions.
Press Enter after typing each answer.
Please enter only an A, B, C, or D for each question.
Question 1: A
Question 2: D
Question 3: B
Question 4: B
Question 5: C
Question 6: B
Question 7: A
Question 8: B
Question 9: C
Question 10: D
Question 11: A
Question 12: C
Question 13: D
Question 14: B
Question 15: D
Question 16: C
Question 17: C
Question 18: A
Question 19: D
Question 20: B
```

```
The student passed the exam.

Correct Answers: 20
Incorrect Answers: 0

Questions that were answered incorrectly:


----------------------------------
Process exited after 35.16 seconds with return value 0
Press any key to continue . . .
```

Sample Run 4:

```
Please enter the student's answers for each of the questions.
Press Enter after typing each answer.
Please enter only an A, B, C, or D for each question.
Question 1: A
Question 2: D
Question 3: B
Question 4: B
Question 5: C
Question 6: B
Question 7: A
Question 8: B
Question 9: C
Question 10: D
Question 11: A
Question 12: C
Question 13: A
Question 14: A
Question 15: A
Question 16: A
Question 17: A
Question 18: B
Question 19: A
Question 20: A
```

```
The student failed the exam.

Correct Answers: 12
Incorrect Answers: 8

Questions that were answered incorrectly:
13
14
15
16
17
18
19
20


------------------------------------
Process exited after 50.97 seconds with return value 0
Press any key to continue . . .
```

Sample run 5:

```
Please enter the student's answers for each of the questions.
Press Enter after typing each answer.
Please enter only an A, B, C, or D for each question.
Question 1: F
Use only an A, B, C, or D!
Please try again.
Z
Use only an A, B, C, or D!
Please try again.
K
Use only an A, B, C, or D!
Please try again.
A
Question 2: B
Question 3: C
Question 4: D
Question 5: A
Question 6: B
Question 7: C
Question 8: D
Question 9: A
Question 10: B
Question 11: C
```

```
Question 12: D
Question 13: A
Question 14: B
Question 15: C
Question 16: D
Question 17: A
Question 18: B
Question 19: C
Question 20: D


The student failed the exam.

Correct Answers: 3
Incorrect Answers: 17
```

```
Questions that were answered incorrectly:
2
3
4
5
7
8
9
10
11
12
13
15
16
17
18
19
20
```