Individual Programming Assignment #2
CS 162: Introduction to Computer Science

The purpose of the second program is to continue refining our programming skills in C++ and practice using **arrays of characters, the subscript operator, the cstring library, and functions with arguments**. Our goal is to create programs with a small functions where main delegates to a series of functions where the real work takes place. In this programming assignment, you are **not** allowed to use global variables. Avoid using break *(unless working with a switch statement).* Limit your functions to no more than 30 <u>statements</u> of code (not including comments, blank lines, or variable definitions). Never use a "return" in the middle of a loop! *The idea with this assignment is to write your own functions to solve this problem.*

Program using a consistent style of indentation, header comments for each function, inline comments for each major block of code. Select self-documenting variable names. Style is worth 20% of the assignment's grade.

Program Assignment Background:
Welcome to in-person learning at PSU! It has been an eventful year and a half working remotely and as we adjust to being back in person there is much to keep track of. I am sure it is difficult for you to know what to do when some of your classes are remote, some are attend anywhere, and others are "sort of" in person but with online components. PSU is working on encoding the classes to help, with AA standing for Attend Anywhere. But there are other designators such as Blended, Hybrid, Remote, and more. I think it would be better if we encoded the classes with designators that have to do with in-person versus remote activities for (a) lecture attendance, (b) lab attendance, (c) exam proctoring, and (d) course materials. If all activities are online, then the simple designator should be "Online". If all of the activities are in-person, then the simple designator should be left blank. But other course designators should indicate which combination of remote versus in-person activities there are.

With your second program, you will start the process of taking some text entered by the user to represent their courses and helping the user decipher it:
1. AA means Attend Anywhere
2. Online means Fully Online
3. Hybrid means both Online and In-Person activities. Subsequent designators will indicate which happens online versus remote (R means Remote; not listed means In-Person) for example: Lect–R, Lab–R, Ex–R, Materials–R
4. So, the user might be facing something like this:
   > **CS162 Hybrid: Lab–R, Ex– R, Mat–R**

   Your program would decipher it to be: **CS162 is offered in a Hybrid model with In person Lecture, Remote Lab, Remote Exams, and online materials.**

Program Assignment Specifics:

Your job is to design and create a program to allow for Universities to encode how they offer courses and to help user's decipher what those course offering designators mean. You will read in designators for Lecture (Lec), Lab (Lab), Exams (Ex), and Course Materials (Mat). The designator is R for remote. If they are not listed, then in-person is expected. *You can make your own wording and create an additional designator as well (per the assignment).*

With this, follow these tasks

Task 1. Introduce the program to the user
Task 2. Allow the user to enter in a course designation as a single text string
   e.g., CS162 Hybrid: Lab – R, Ex – R, Mat – R
   a. Read in the entire course designation into an array of characters and echo it back to the user.
Task 3. Extract in the course (e.g., CS162) and display it
Task 4. Extract in the type of offering (e.g., AA, Online, Hybrid).
   a. If there isn't any designator, then the class is In-person.
   b. Output what AA, Online and Hybrid means for the user based on what was extracted.
Task 5. Decipher the Lecture, Lab, Exam, and Course Materials offerings
   a. If there isn't any designator, then that portion is In-person
   b. R means Remote
   c. Add another designator of your choosing
Task 6. Display the resulting information for this course:
   a. CS162 is offered as a Hybrid class with a Remote lab, Remote exams, and all course materials are available remotely.
Task 7. After performing these tasks ask the user if they would like to do this again! Continue until the user wants to quit.

*** THE ALGORITHM IS CRITICAL! How to use the array?

Things you should know...as part of your program:
1. You may limit the size of the course designator to no more than 200 characters.
2. You should read using the 3 argument version of cin.get. This means that you will need to perform cin.ignore after each and every input operation. Pay close attention to doing this. Make no exceptions.
3. Use the cstring library with strlen to know when to stop processing the array of characters. strlen should not be in the conditional expression. Consider using it prior to a loop and storing the results of strlen in a variable!!
4. You may **not** use any global variables in this program!
5. You may **not** use the string class – instead use arrays of characters with cstrings

CS162 - Checklist for First Week of Cycle

Cycle	Monday	Tuesday	Thursday	By Friday
First week Oct 18-22nd	Algorithm Due by 7pm	Discussion: Share Flowchart to your Virtual Group	First Progress Submission: Tasks #1 and 2	Discussion Response
Second week Oct 25th-29th	Second Progress Submission Tasks #3-4	Discussion (Critique)	Submit Finished Assignment	Discussion Response

1. **Monday – Submit a typed Algorithm**
   a. Due **by 7pm**
   b. Submit to **Assignments** on Canvas
   c. The Algorithm should be written in outline form, using full English sentences (not code and not pseudo code)
   d. It should be at least 400 words

2. **Tuesday – Share a Flowchart** with your Virtual Group
   a. Due **by 7pm**
   b. Submit it as a **Discussion Post** on Canvas

3. **Thursday – Submit First Progress Submission** as a .cpp file
   a. The progress submission must compile and have comments with your name and the purpose of the program
   b. Submit to Assignments on Canvas
      i. Learn to transfer the .cpp file from linux
   c. The progress submission must have these components:
      i. Functioning main program
      ii. Implement **Task #1 and #2**
      iii. Creating functions for these tasks is recommended for this first progress submission. However, you can delay the creation of functions until the second progress submission.
      iv. Code submitted should compile and run

4. **By Friday (earlier is better) Respond** to a flowchart posting
   a. Submit it as a response to a **Discussion Post** on Canvas
   b. Comment on at least one of your Virtual Group's flowcharts.
      i. What were some ideas that you found useful
      ii. Is there something missing that might be important

CS162 - Checklist for <u>First</u> Week of Cycle

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Second week Oct 25th-29th	Second Progress Submission Tasks #3-4	Discussion (Critique)	Submit Finished Assignment Tasks #1-7	Discussion Response

5. **Monday - Submit** a **progress submission** as a .cpp file
    a. Due **by 7pm**
    b. Submit to Assignments on Canvas
        i. Use an SSH program to transfer your program from linux
    c. The progress submission must compile and run
    d. Provide a **header comment** with a <u>paragraph</u> describing the purpose of the program
    e. The progress submission must have these components:
        i. Functioning main program
        ii. Implement and Demonstrate **Tasks #1-4** <mark>using functions</mark>
        iii. The code should compile and run

6. **Tuesday – Critique the Plan** with your Virtual Group
    a. Due **by 7pm**
    b. Did the algorithm (or flowchart) need to change?
    c. Were there things you would do differently next time?
    d. Ask a question of your Virtual Group

7. **Thursday - Submit** a **completed program** as a .cpp file
    a. Due by **7pm**
    b. **Remember comments and style are 20% of the grade**
    c. Submit to Assignments on Canvas
        i. Use an SSH program to transfer your program from linux
        ii. Do not submit the a.out file.

8. **By Friday (earlier is better) Respond** to your Virtual Group
    a. Submit it as a response to a **Discussion Post** on Canvas
    b. Talk about how to improve with the algorithm as we move on to the next programming assignment