

Assignment xx Algorithmic Design Document

Make a copy before you begin (File -> Make a copy). Add the Assignment # above and complete the sections below BEFORE you begin to code and submit with your Assignment to D2L (File -> Download -> PDF). The sections will expand as you type.

zyBooks

Add your zyBooks screenshots for the % and assigned zyLabs completions below. Required percentages: all assigned zyLabs, Challenge Activity with at least 70%, and Participation Activity with at least 80%.

zyLabs, Challenge, and Participation % Screenshot:

3. CS 161 Branches

■ 100% ■ 100% ■ 100% ▼

Assigned zyLabs completion Screenshot:

Assignment

Program description:

Sort people into groups based on specified criteria to identify vaccination eligibility:

Age groups [≤ 16 , > 16 , ≥ 45 , ≥ 65]

Then by discrete values:

Medical worker

Underlying conditions

Before you begin coding, **you must first plan out the logic** and think about what data you will use to test your program for correctness. All programmers plan before coding - this saves a lot of time and frustration! Use the steps below to identify the inputs and outputs, calculations, and steps needed to solve the problem.

Algorithmic design:

- Identify all of the user input. What are the data types of the inputs? Define the input variables.

```
int userAge;  
char medicalWorker;
```

```
char healthCond;  
cin >> userAge;  
cin >> medicalWorker;  
cin >> healthCond;
```

b. Describe the program output. What is displayed to the user? What are the data types of the output? Define the output variables.

```
Collect data, test for eligibility immediately and collect more if needed.  
cout << "Welcome to my COVID-19 Vaccine Eligibility program!!" << endl;  
cout << "Please enter your age:" << endl;  
cout << "Are you a health care worker? (y/n)" << endl;  
cout << "Do you have an underlying condition? (y/n)" << endl;  
cout << "You are eligible and can register after [switch case for date]"
```

c. What calculations do you need to do to transform inputs into outputs? List all formulas needed, if applicable. If there are no calculations needed, state there are no calculations for this algorithm.

Test age against eligibility segments, then test age group key for eligibility date

d. Design the logic of your program using pseudocode or flowcharts. Here is where you would use conditionals, loops, functions or array constructs (if applicable) and list the steps in transforming inputs into outputs. Walk through your logic steps with the test data from the assignment document.

```
char ageGroup;  
int userAge;  
char medicalWorker;  
char healthCond;  
string eligibleDate;  
  
// welcome message:  
cout << "Welcome to my COVID-19 Vaccine Eligibility program!!" <<  
endl;  
// get user age input  
cout << "Please enter your age: " << endl;  
cin >> userAge;  
  
// test user age for eligibility group  
if (userAge >= 65)  
    ageGroup = a;  
else if (userAge >= 45)  
    ageGroup = b;  
else if (userAge > 16)  
    ageGroup = c  
else {
```

```

    cout << "You are not eligible for the vaccine!" << endl;
    exit
}

switch (ageGroup) {
    case a:
        eligibleDate += "April ";
    case b:
        eligibleDate += "May ";
    case c:
        eligibleDate += "June ";

// is user a medical worker?
cout << "Are you a health care worker? (y/n) " << endl;
cin >> medicalWorker;
if (medicalWorker == 'y') {
    cout << "You are eligible and can register now." << endl;
    exit;
}

// does user have underlying conditions?
cout << "Do you have an underlying condition? (y/n) " << endl;
cin >> healthCond;
if (healthCond == 'y')
    eligibleDate += "15th";
else
    eligibleDate += "1st";
cout << "You are eligible and can register after " \
    << eligibleDate << "." << endl;

return 0;

```