Name: _____DEMO VERSION_____ID#: _____

COS 120 C++ Programming
Final Exam DEMO (deliverables on Canvas)

1.
7%
	Convert the following **`if-else`** block to the corresponding **`switch`** block:
	
	`if (c == 'y' || c == 'Y') {`
	`  cout << "Yes" << endl;`
	`}`
	`else if (c == 'n' || c == 'N') {`
	`  cout << "No" << endl;`
	`}`
	`else {`
	`  cout << "Unknown" << endl;`
	`}`

2. 7%	Define a template function called **`largest`** that receives three parameters and returns the largest.
3. 7%	Define a function called **`arraysum`** that receives an array of real numbers and returns the sum of all elements inside it.
4. 7%	Define a void function called **`applyVAT`** which takes a variable containing a product's price and adds 20% tax to it.
5. 7%	Define the definition of a class named **`Person`**, which has two private members – name and age. Declare three constructors for the class – default constructor, two-parameter constructor and the copy constructor. Declare a destructor for that class.
6. 15%	Write a program to read the first and last name of the user. The program should then display the person's initials (the starting letters of the first and last names), the number of letters in the first and the number of letters in their last name.
7. 15%	Write a program to read a word from the user and then display it vertically, the last character appearing on the top.
8. 15%	Write a program to read a list of integers from a file called **numbers.txt**, which contains one number per line, and save those numbers in increasing order in a file called **sorted.txt**.
9. 15%	Define a class called **`Student`** which has three attributes – *name*, *exams* and *quizzes*. Add the necessary constructors, accessors and mutators. Add a member function called **`getFinalGrade`**, which calculates and returns the final grade of the student as a number between 0 and 100, where quizzes make 40% and exams make 60% of that grade. Add a method called **`displayGrade`**, which calls **`getFinalGrade`** above and outputs the corresponding letter for the final grade of the student. Use the following grade scale: 0-60 (F), 61-70 (D), 71-80 (C), 81-90 (B), and 91-100 (A). Override the less than operator (operator<) that is checking whether the left operand final grade is less than the right operand final grade Write a main function to create an instance of the **`Student`** class and call the **`displayGrade`** method.
10. 15%	Define an abstract class called **`BaseStudent`**, with one abstract method called **`displayGrade`**. Change the **`Student`** class from the previous problem to inherit the **`BaseStudent`** class. Add a new class called **`PFStudent`**, which inherits the Student class and overrides the **`displayGrade`** method to output "**P**" if the final grade is above 60 and "**F**" otherwise. Write a main function in which to create instances of the **`Student`** and **`PFStudent`** classes and call the **`displayGrade`** method on each one of them.