**Logo

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**CS360 - Programming in C and C++**

**Quiz #2**

**Student Name: Student ID:**

1. The class *clockType* as follows was designed to implement the time of day in a program. Certain applications, in addition to hours, minutes, and seconds, might require you to store the time zone. Derive the class *extClockType* from the class *clockType* by adding a member variable to store the time zone. Add the necessary member functions and constructors to make the class functional. Also, write the definitions of the member functions and the constructors. Finally, write a *main* program to test your class.

*class clockType{*

*public:*

*void setTime(int, int, int);*

*void getTime(int&, int&, int&) const;*

*void printTime() const;*

*void incrementSeconds();*

*void incrementMinutes();*

*void incrementHours();*

*bool equalTime(const clockType&) const;*

*private:*

*int hr;*

*int min;*

*int sec;*

*};*

*void clockType::setTime(int hours, int minutes, int seconds) {*

*if (0 <= hours && hours < 24) hr = hours;*

*else hr = 0;*

*if (0 <= minutes && minutes < 60) min = minutes;*

*else min = 0;*

*if (0 <= seconds && seconds < 60) sec = seconds;*

*else sec = 0;*

*}*

*void clockType::getTime(int& hours, int& minutes, int& seconds) const{*

*hours = hr;*

*minutes = min;*

*seconds = sec;*

*}*

*void clockType::printTime() const{*

*if (hr < 10)*

*cout << "0";*

*cout << hr << ":";*

*if (min < 10)*

*cout << "0";*

*cout << min << ":";*

*if (sec < 10)*

*cout << "0";*

*cout << sec;*

*}*

*void clockType::incrementHours(){*

*hr++;*

*if (hr > 23) hr = 0;*

*}*

*void clockType::incrementMinutes(){*

*min++;*

*if (min > 59){*

*min = 0;*

*incrementHours(); //increment hours*

*}*

*}*

*void clockType::incrementSeconds(){*

*sec++;*

*if (sec > 59){*

*sec = 0;*

*incrementMinutes(); //increment minutes*

*}*

*}*

*bool clockType::equalTime(const clockType& otherClock) const {*

*return (hr == otherClock.hr && min == otherClock.min && sec == otherClock.sec);*

*}*