Actividad 1.3: Clases Conceptos Básicos

CECS2200 Computer Programming Fundamentals

Nombre: Groupo 6 Sec: 22

Instrucciones para el estudiante:

1. Definición de la clase, use la estructura de arreglos en la definición de los atributos.

2. Tabla Descriptiva

3. Diagrama de Clases UML ("Unified Modeling Language")

4. Separar el archivo del código original en tres archivos dentro del mismo proyecto.

5. Salida de programa con los datos originales del problema.

6. Envíe su solución en formato PDF.

Variable	**Descripción**
lottery[]	Variable tipo arreglo de longitud definida que almacena números aleatorios.
user[]	Variable tipo arreglo de longitud definida que almacena números definidos por el usuario.
MAX_CAPACITY	Variable de tipo entero constante que almacena el valor de la longitud de arreglo.
Función Miembro	**Descripción**
Lottery():Lottery	Constructor por defecto es iniciado cuando no hay parámetros en la definición de objeto de la clase Lottery.
Lottery(aSize: const int) : Lottery	Constructor con parámetros iniciales de tipo int.
~Lottery() : Lottery	Función Destructora.
setSize(aSize : int) : void	Función que determina el valor de la variable size.
setRandomNumbers() : void	Función que determina valores aleatorios para el arreglo de tipo entero lottery.
setUserNumbers() : void	Función que determina los valores de la variable de tipo arreglo user, entrados por el usuario.
getSize() const : void	Función que retorna valor size.
displayRandomArray() : void	Función que imprime contenido del arreglo lottery.
displayUserArray() : void	Función que imprime contenido del arreglo user.
compareArrays() : void	Función que compara los arreglos de tipo entero lottery y user y determina si los valores son iguales.
matchingDigits() : int	Función que busca los valores indenticos dentro de los arreglos lottery y user.

Class:

Lottery
-lottery[MAX_CAPACITY: const int] : int -user[MAX_CAPACITY: const int] : int -MAX_CAPACITY: const int
+Lottery() : +Lottery() : +~Lottery() : +setSize(aSize : int) : void +setRandomNumbers() : void +setUserNumbers() : void +getSize() : void +displayRandomArray() : void +displayUserArray() : void +compareArrays() : void +matchingDigits() : int

Lottery Application:

LotteryApplication.h

```
#pragma once

#include <iostream>
using namespace::std;

const int MAX_CAPACITY = 5;
class Lottery {
private:
	int lottery[MAX_CAPACITY];
	int user[MAX_CAPACITY];
	int size;

public:
	Lottery();
	Lottery(const int aSize);
	~Lottery();

	void setSize(int aSize);
	void setRandomNumbers();
	void setUserNumbers();
	int getSize() const;

	void displayRandomArray() const;
	void displayUserArray() const;

	void compareArrays();
	int matchingDigits();
};
```

Main.cpp

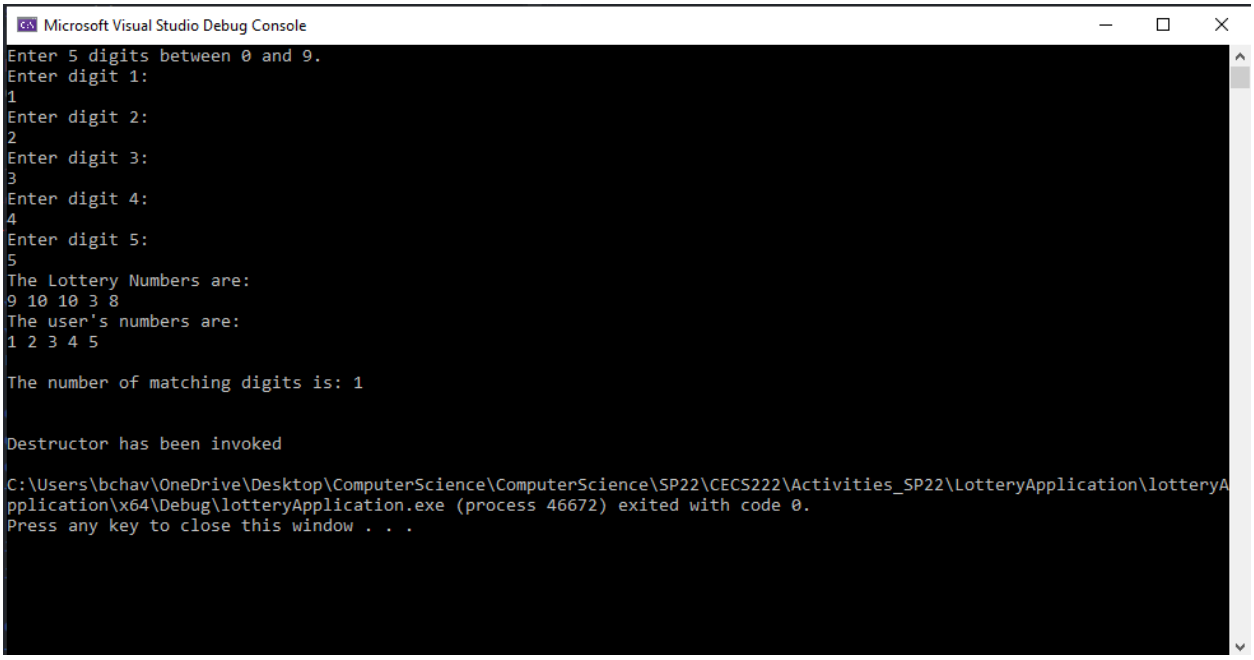
```
#include <iostream>
#include <stdlib.h>
#include "LotteryApplication.h"

using namespace::std;

int main() {
	const int aSize = 5;

	Lottery myNumbers(aSize);

	myNumbers.displayRandomArray();
	myNumbers.displayUserArray();
	myNumbers.compareArrays();
	cout << endl;

	return 0;
}
```

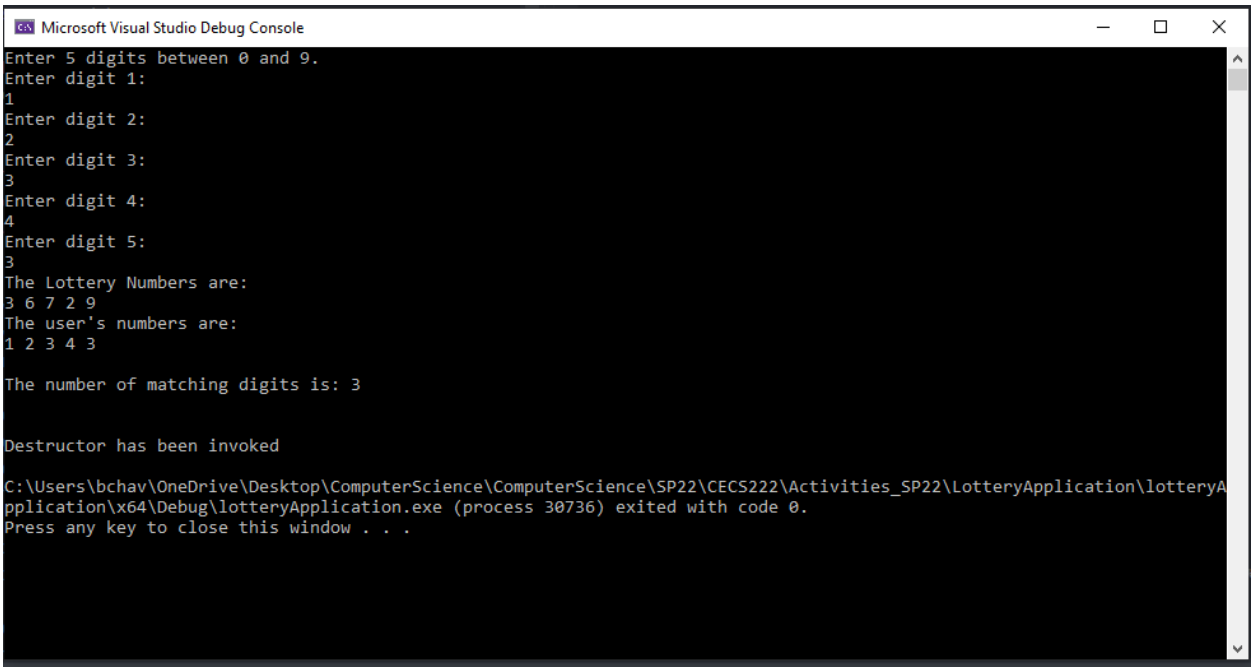
LotteryApplication.cpp

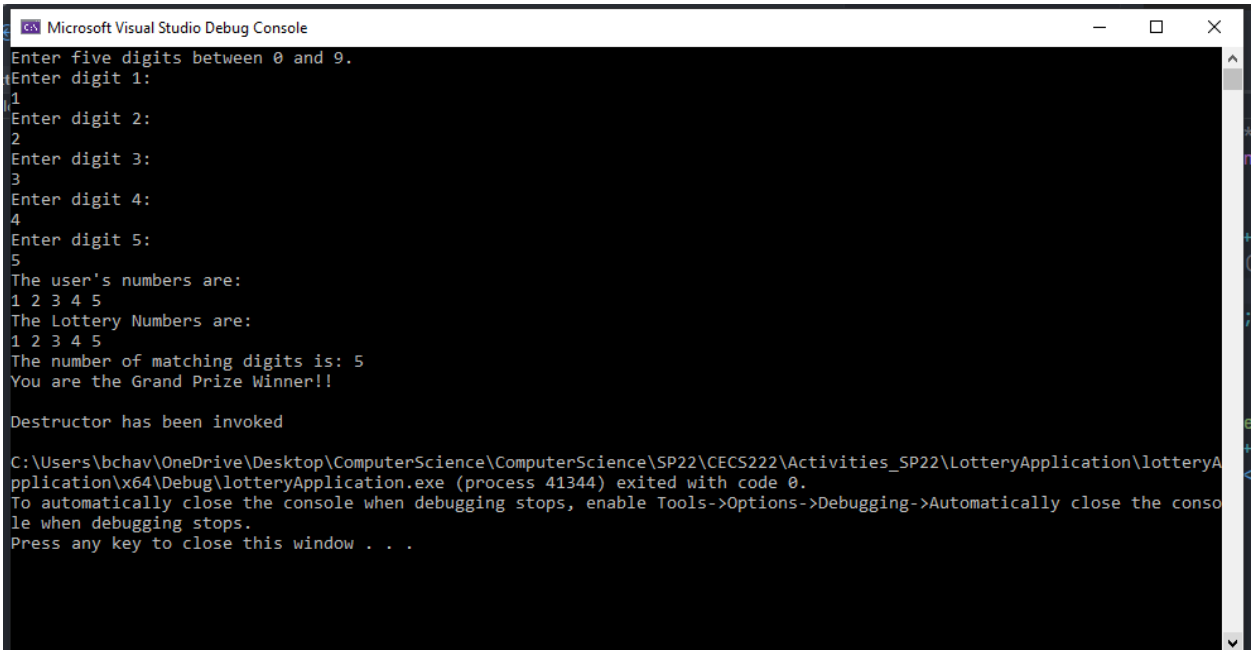
```
#include <iostream>
#include <cstdlib>
#include "LotteryApplication.h"

using namespace::std;
//Constructor and Destructor
Lottery::Lottery() {
	setSize(5);
	//set lottery and user to 0
	for (int i = 0; i < getSize(); i++) {
		lottery[i] = 0;
		user[i] = 0;
	}//end for

}
Lottery::Lottery(const int aSize) {
	setSize(aSize);
	setRandomNumbers();
	setUserNumbers();
}
Lottery::~Lottery() {
	cout << "\nDestructor has been invoked" << endl;
}

// Mutators*********************************************
void Lottery::setRandomNumbers() {
	const int MinValue = 0;
	const int MaxValue = 10;
	//get the system time and seed the random generator
	unsigned seed = time(0);
	srand(seed);

	for (int i = 0; i < getSize(); i++) {
		lottery[i] = (rand() % (MaxValue - MinValue + 1)) + MinValue;
	}//end for
}
void Lottery::setUserNumbers() {
	cout << "Enter " << getSize() << " digits between 0 and 9." << endl;
	for (int i = 0; i < getSize(); i++) {
		cout << "Enter digit " << i + 1 << ":\t" << endl;
		cin >> user[i];
	}//end for
}
void Lottery::setSize(int aSize) {
	while (aSize > 5) {
		cout << "Invalid size please try again with digits between 1 and 5." <<
endl;
		cin >> aSize;
	}
		size = aSize;
}

// Accessors*********************************************
int Lottery::getSize() const {
	return size;
}
```

```
//display***********************************************
void Lottery::displayRandomArray() const {
	cout << "The Lottery Numbers are:\n";
	for (int i = 0; i < getSize(); i++) {
		cout << lottery[i] << " ";
	}//end for
	cout << endl;
}
void Lottery::displayUserArray() const {
	cout << "The user's numbers are:\n";
	for (int i = 0; i < getSize(); i++) {
		cout << user[i] << " ";
	}//end for
	cout << endl;
}
//compare arrays*****************************************
void Lottery::compareArrays() {
	if (matchingDigits() == 5) {
	cout << "The number of matching digits is: " << matchingDigits() << endl;
	cout << "You are the Grand Prize Winner!!" << endl;
	}//end if
	else
		cout << "\nThe number of matching digits is: " << matchingDigits() <<
endl;
}
int Lottery::matchingDigits() {
	int matchDigits = 0;
	for (int i = 0; i < getSize(); i++) {
		for (int j = 0; j < getSize(); j++) {
			if (user[i] == lottery[j])
				matchDigits++;
		}//end if
	}//end for
	return matchDigits;
}
```

Salida:


Microsoft Visual Studio Debug Console
Enter 5 digits between 0 and 9.
Enter digit 1:
1
Enter digit 2:
2
Enter digit 3:
3
Enter digit 4:
4
Enter digit 5:
5
The Lottery Numbers are:
9 10 10 3 8
The user's numbers are:
1 2 3 4 5
The number of matching digits is: 1
Destructor has been invoked
C:\Users\bchav\OneDrive\Desktop\ComputerScience\ComputerScience\SP22\CECS222\Activities_SP22\LotteryApplication\lotteryApplication\x64\Debug\lotteryApplication.exe (process 46672) exited with code 0.
Press any key to close this window . . .


Microsoft Visual Studio Debug Console
Enter 5 digits between 0 and 9.
Enter digit 1:
1
Enter digit 2:
2
Enter digit 3:
3
Enter digit 4:
4
Enter digit 5:
3
The Lottery Numbers are:
3 6 7 2 9
The user's numbers are:
1 2 3 4 3
The number of matching digits is: 3
Destructor has been invoked
C:\Users\bchav\OneDrive\Desktop\ComputerScience\ComputerScience\SP22\CECS222\Activities_SP22\LotteryApplication\lotteryApplication\x64\Debug\lotteryApplication.exe (process 30736) exited with code 0.
Press any key to close this window . . .


Microsoft Visual Studio Debug Console
Enter five digits between 0 and 9.
Enter digit 1:
1
Enter digit 2:
2
Enter digit 3:
3
Enter digit 4:
4
Enter digit 5:
5
The user's numbers are:
1 2 3 4 5
The Lottery Numbers are:
1 2 3 4 5
The number of matching digits is: 5
You are the Grand Prize Winner!!
Destructor has been invoked
C:\Users\bchav\OneDrive\Desktop\ComputerScience\ComputerScience\SP22\CECS222\Activities_SP22\LotteryApplication\lotteryA
pplication\x64\Debug\lotteryApplication.exe (process 41344) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .