**********ASSIGNMENT 8**********

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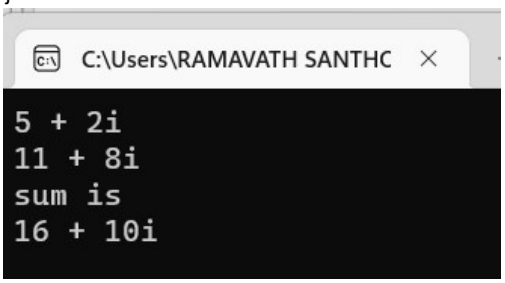
```
/* 1. Write a program to swap the values two integer members of different classes
using friend function.
*/
#include <iostream>

using namespace std;

class B;
class A
{
        int data;

        public:
                A(int n)
                {
                  data = n;
           }
                friend void swap(A&, B&);
                void show_data()
                {
                  cout << "A =  " << data << endl;
                }
};

class B
{
        int data;

        public:
                B(int n){ data = n; }
                friend void swap(A&, B&);
                void show_data(){ cout << "B = " << data << endl; }
};

void swap(A &a, B &b)
{
        int temp = a.data;
        a.data = b.data;
        b.data = temp;
}

int main()
{
        A a(10);
        B b(20);
```

```
	cout << "*********Before swapping..." << endl;
	a.show_data();
	b.show_data();
	swap(a, b);
	cout << "*********After swapping..." << endl;
	a.show_data();
	b.show_data();
	return 0;
}
```

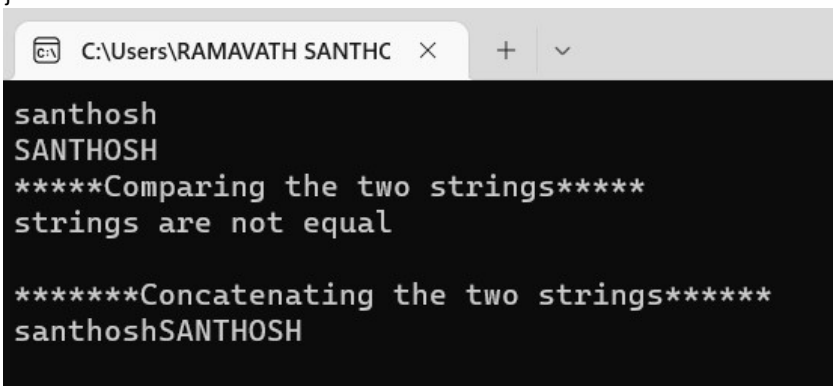

```
/*
2. Write a program for addition of two complex numbers using friend function (use
constructor function to initialize data members of complex class).
*/

#include <iostream>

using namespace std;

class complex
{
	int real, img;

	public:
		complex(int a, int b)
		{
			real = a;
			img = b;
		}

		friend complex add(complex, complex);

		void show()
		{
			cout << real << " + " << img << "i" << endl;
		}
};
```

```
complex add(complex c1, complex c2)
{
	return complex(c1.real + c2.real, c1.img + c2.img);
}

int main()
{
	complex c1(5, 2), c2(11, 8);
	c1.show();
	c2.show();
	cout << "sum is" << endl;
	add(c1, c2).show();
	return 0;
}
```



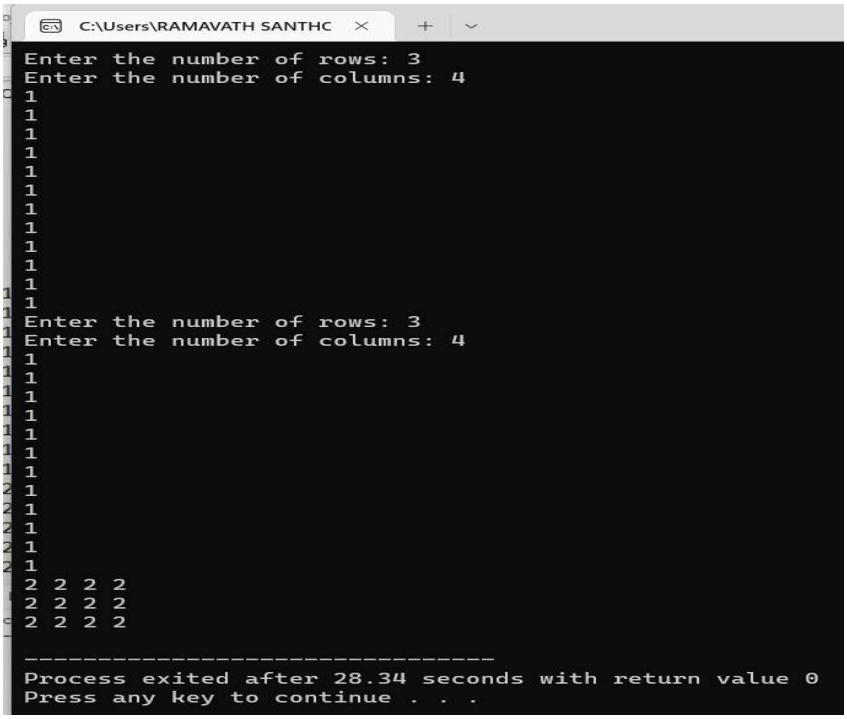

```
/*
3. Define a class string and overload == to compare two strings and + operator for
concatenation of two strings.
*/
#include <iostream>

using namespace std;

class myString
{
	string s;

	public:
		myString(string str)
		{
			s = str;
		}

		void show()
		{
			cout << s << endl;
		}

		bool operator == (myString s1)
		{
```

```
                return s == s1.s;
        }

        myString operator + (myString s1)
        {
                return myString(s + s1.s);
        }
};

int main()
{
        myString s1("ayush");
        myString s2("Ayush");
        s1.show();
        s2.show();

        cout << "Comparing the two strings\n";
        cout << (s1 == s2 ? "strings are equal": "strings are not equal") << endl;

        cout << "Concatenating the two strings\n";
        myString s3 = s1 + s2;
        s3.show();
        return 0;
}
```




```
/*
4. Write a program to perform matrix addition using operator overloading concept.

Matrix
a[100][100], m,n
void getdata()
void show()
matrix operator+(matrix &amp;amp;x,matrix &amp;amp;y)
*/
```

```
#include <iostream>

using namespace std;

class matrix
{
	int a[100][100], m, n;

	public:
		void getdata()
		{
			cout << "Enter the number of rows: "; cin >> m;
			cout << "Enter the number of columns: "; cin >> n;

			for(int i = 0; i < m; i++)
				for(int j = 0; j < n; j++)
					cin >> a[i][j];
		}

		void show()
		{
			for(int i = 0; i < m; i++){
				for(int j = 0; j < n; j++)
					cout << a[i][j] << " ";
				cout << endl;
			}
		}

		matrix operator + (matrix m1)
		{
			matrix m3;
			m3.m = m;
			m3.n = n;
			for(int i = 0; i < m; i++)
				for(int j = 0; j < n; j++)
					m3.a[i][j] = a[i][j] + m1.a[i][j];
			return m3;
		}
};

int main()
{
	matrix m1, m2;
	m1.getdata();
	m2.getdata();

	matrix m3 = m1 + m2;
	m3.show();
	return 0;
}
```

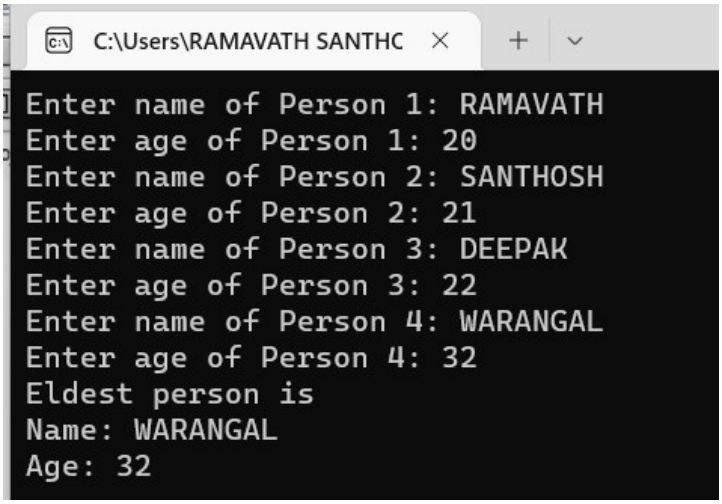


/*
5. Write a program to maintain the records of person with details (name and age) and find the eldest among them. The program must use this pointer to return the result.
*/

```
#include <iostream>

using namespace std;

class Person
{
private:
   string name;
   int age;
public:
   Person();
   int get_age()
   {
      return age;
   }

   void set_data(string s, int n)
   {
```

```
        name = s;
        age = n;
    }

    void show_data()
    {
        cout << "Name: " << name << endl;
        cout << "Age: " << age << endl;
    }
};

Person::Person()
{
    name = "";
    age = -1;
}

class Record
{
private:
    Person *arr;
    int n;
public:
    Record(int sz);
    void show_eldest();
};

Record::Record(int sz)
{
    n = sz;
    arr = new Person[n];
    for(int i = 0; i < n; i++)
    {
        string name;
        int age;

        cout << "Enter name of Person " << i + 1 << ": ";
        cin >> name;
        cout << "Enter age of Person " << i + 1 << ": ";
        cin >> age;

        arr[i].set_data(name, age);
    }
}

void Record::show_eldest()
{
    int max_idx = 0;
    for(int i = 1; i < n; i++)
        if(this->arr[i].get_age() > this->arr[max_idx].get_age())
            max_idx = i;
```

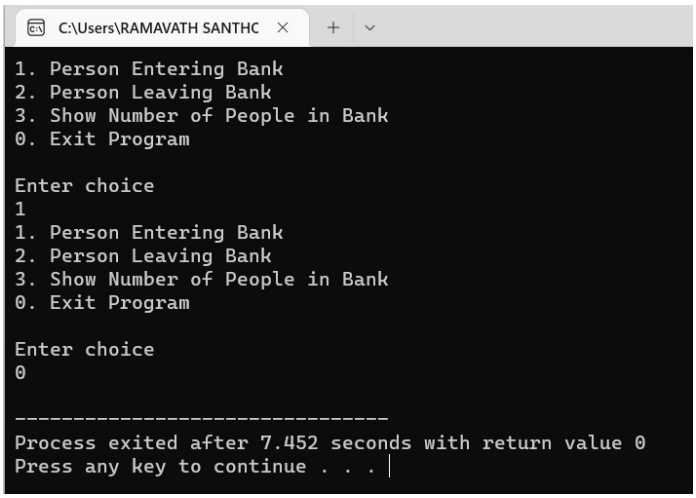
```
    cout << "Eldest person is " << endl;
    this->arr[max_idx].show_data();
}

int main()
{
    Record record(4);
    record.show_eldest();
    return 0;
}
```




```
/*
6. Write a C++ program to count the number of persons inside a bank, by increasing count
whenever a person enters a bank, using an increment(++) operator overloading function, and
decrease the count whenever a person leaves the bank using a decrement(--) operator
overloading function inside a class
*/

#include <iostream>

using namespace std;

class Counter
{
private:
    int count;

public:
    Counter();
    Counter operator++(int)
```

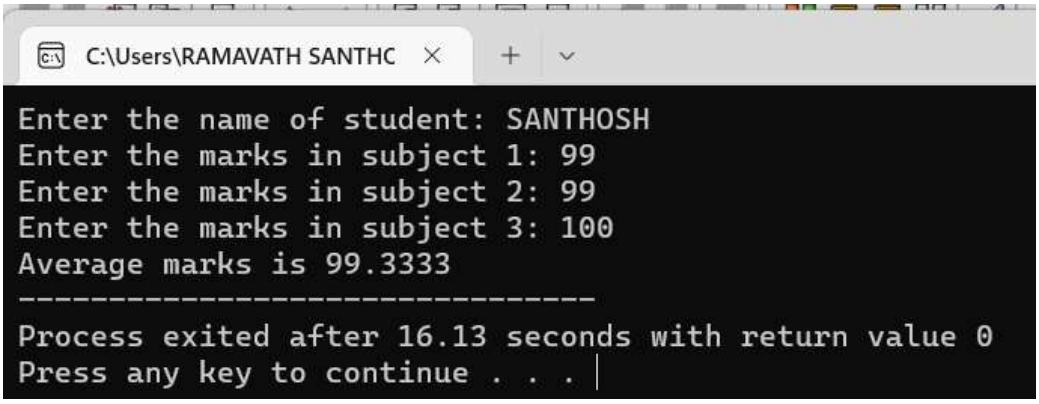
```
    {
        Counter c = *this;
        count++;
        return c;
    }
    Counter operator--(int)
    {
        Counter c = *this;
        count--;
        return c;
    }
    void show() { cout << "Number of persons: " << count << endl; }
};

Counter::Counter()
{
    int count = 0;
}

int main()
{
    Counter c;
    while (1)
    {
        cout << "1. Person Entering Bank" << endl;
        cout << "2. Person Leaving Bank" << endl;
        cout << "3. Show Number of People in Bank" << endl;
        cout << "0. Exit Program" << endl;
        cout << "\nEnter choice" << endl;
        int choice;
        cin >> choice;

        if (!choice)
            break;

        switch (choice)
        {
        case 1:
            c++;
            break;
        case 2:
            c--;
            break;
        case 3:
            c.show();
            break;
        default:
            cout << "Wrong choice..." << endl;
            break;
        }
    }
```

```
    return 0;
}
```




```
/*
7. Write a program to accept the student detail such as name and 3 different marks by get_data()
method and display the name and average of marks using display() method. Define a friend
class for calculating the average of marks using the method marrk_avg().
*/

#include <iostream>

using namespace std;

class Average;

class Student
{
   private:
      string name;
      int marks[3];

   public:
      Student()
      {
         name = "";
         marks[0] = marks[1] = marks[2] = 0;
      }

      void get_data()
      {
         cout << "Enter the name of student: ";
```

```
        cin >> name;
        cout << "Enter the marks in subject 1: ";
        cin >> marks[0];
        cout << "Enter the marks in subject 2: ";
        cin >> marks[1];
        cout << "Enter the marks in subject 3: ";
        cin >> marks[2];
    }

    friend class Average;
};

class Average
{
  public:
    float show_average(Student s)
    {
        return (s.marks[0] + s.marks[1] + s.marks[2]) / 3.0;
    }
};

int main()
{
  Student s;
  s.get_data();
  Average a;
  cout << "Average marks is " << a.show_average(s);
  return 0;
}
```



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