Programming Lab - 1
Assignment - 1

1. **Create an Employee class to enter and display information of employee such as EmpID, Name, Address, Designation and Salary of last five years and calculate average salary(create five objects to enter and display data).**

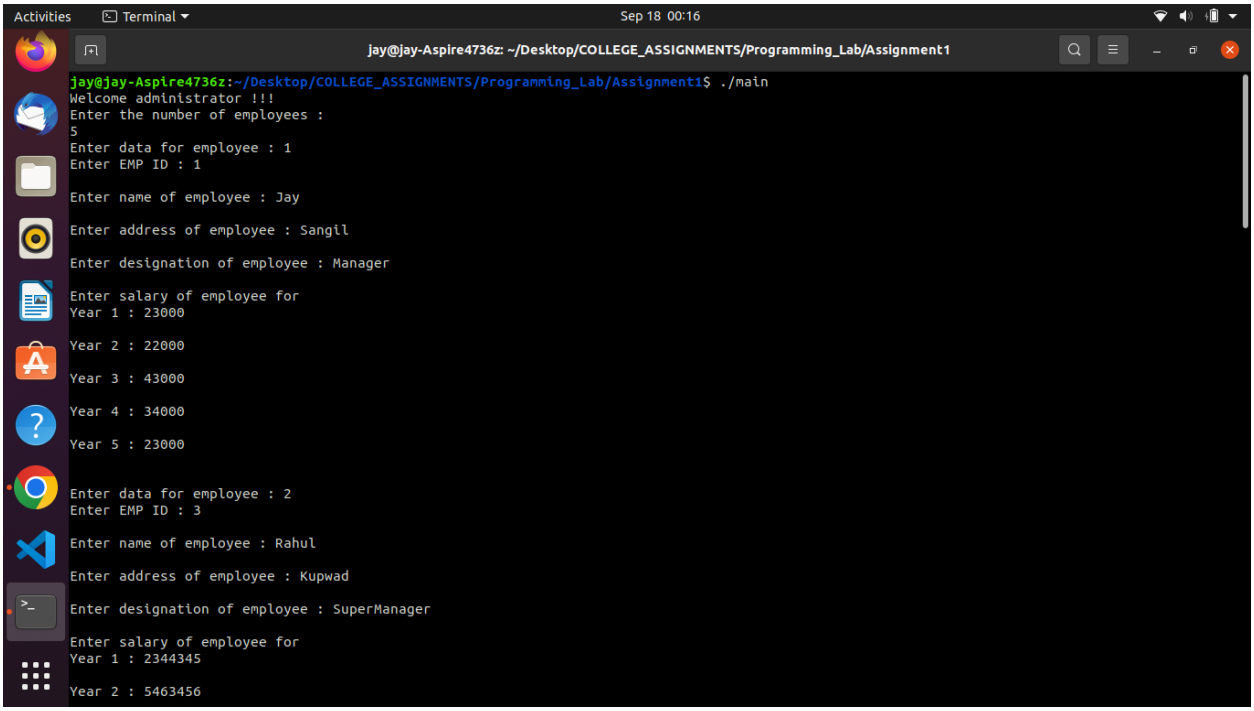
   Code -

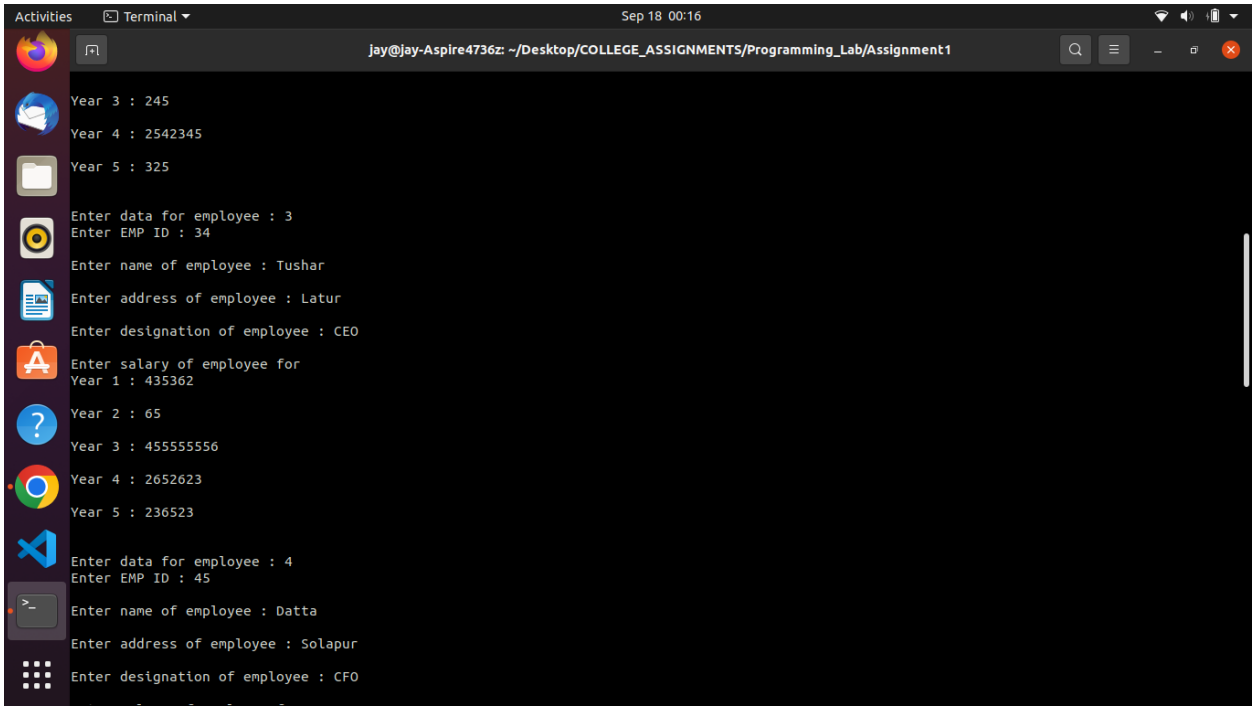
```
#include<iostream>
#include<string.h>
using namespace std;
class Employee{
public:
    int empID;
    string name;
    string address;
    string designation;
    int salary[5];
    double avg_salary;
public:
    void display(){
        cout << "Employee Id : " << empID << endl;
        cout << "Name : " << name << endl;
        cout << "Address : " << address << endl;
        cout << "Designation : " << designation << endl;
        cout << "Salary : " << salary << endl;
    }
    void get_id(){
        cout << "Enter EMP ID : ";
        cin >> empID;
        cout << endl;
    }
    void get_name(){
        cout << "Enter name of employee : " ;
        cin >> name ;
        cout << endl;
    }
    void get_add(){
        cout << "Enter address of employee : " ;
        cin >> address;
        cout << endl;
    }
    void get_desg(){
```

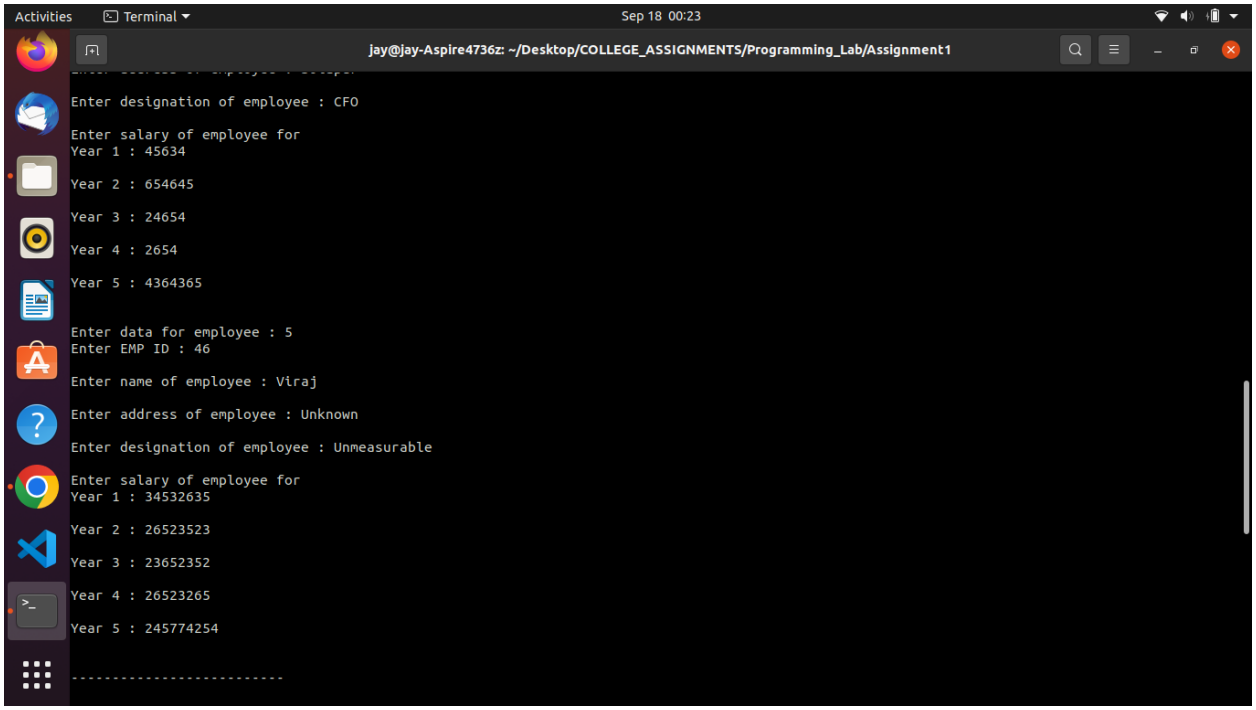
```
        cout << "Enter designation of employee : " ;
        cin >> designation;
        cout << endl;
    }
    void get_sal(){
        avg_salary = 0;
        cout << "Enter salary of employee for " << endl;
        for(int i = 0; i < 5; ++i){
            cout << "Year " << i + 1 << " : ";
            cin >> salary[i];
            avg_salary += salary[i];
            cout << endl;
        }
        avg_salary /= 5;
        cout << endl;
    }
    void input_data(){
        get_id();
        get_name();
        get_add();
        get_desg();
        get_sal();
    }
    void output_data(){
        cout << "Employee ID : " << empID << endl;
        cout << "Name : " << name << endl;
        cout << "Address : " << address << endl;
        cout << "Designation : " << designation << endl;
        cout << "Average Salary : " << avg_salary << endl;
    }
};
int main(){
    cout << "Welcome administrator !!!" << endl ;
    int NUMBER_EMPLOYEES;
    cout << "Enter the number of employees : " << endl;
    cin >> NUMBER_EMPLOYEES;
    Employee employee[NUMBER_EMPLOYEES];
    for(int i = 0; i < NUMBER_EMPLOYEES; ++i){
        cout << "Enter data for employee : " << i + 1 << endl;
        Employee tmp;
        employee[i] = tmp;
        employee[i].input_data();
    }
    cout << "-------------------------\n\n\n";
```

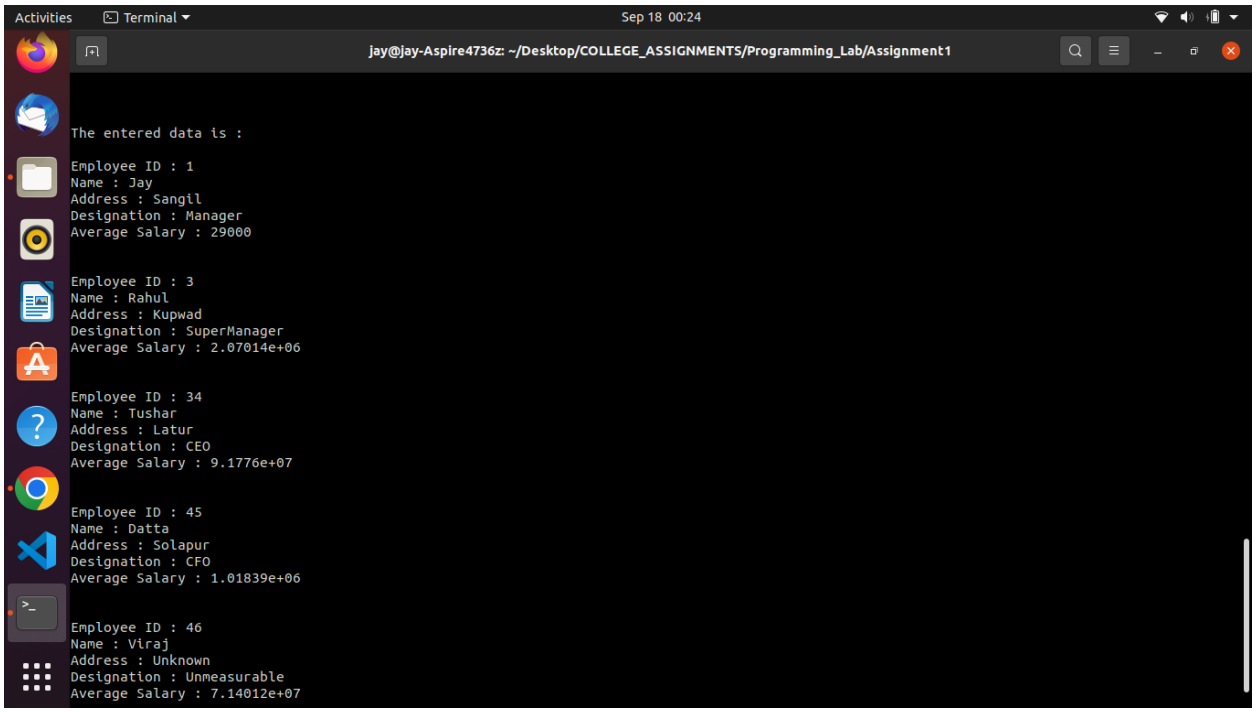
```
    cout << endl;
    cout << "The entered data is :" << endl << endl;
    for(int i = 0; i < NUMBER_EMPLOYEES; ++i){
        employee[i].output_data();
        cout << endl;
        cout << endl;
    }
}
```

Output -




Activities
Terminal
Sep 18 00:16
jay@jay-Aspire4736z: ~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1
Year 3 : 245
Year 4 : 2542345
Year 5 : 325
Enter data for employee : 3
Enter EMP ID : 34
Enter name of employee : Tushar
Enter address of employee : Latur
Enter designation of employee : CEO
Enter salary of employee for
Year 1 : 435362
Year 2 : 65
Year 3 : 455555556
Year 4 : 2652623
Year 5 : 236523
Enter data for employee : 4
Enter EMP ID : 45
Enter name of employee : Datta
Enter address of employee : Solapur
Enter designation of employee : CFO


Activities
Terminal
Sep 18 00:23
jay@jay-Aspire4736z: ~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1
Enter designation of employee : CFO
Enter salary of employee for
Year 1 : 45634
Year 2 : 654645
Year 3 : 24654
Year 4 : 2654
Year 5 : 4364365
Enter data for employee : 5
Enter EMP ID : 46
Enter name of employee : Viraj
Enter address of employee : Unknown
Enter designation of employee : Unmeasurable
Enter salary of employee for
Year 1 : 34532635
Year 2 : 26523523
Year 3 : 23652352
Year 4 : 26523265
Year 5 : 245774254

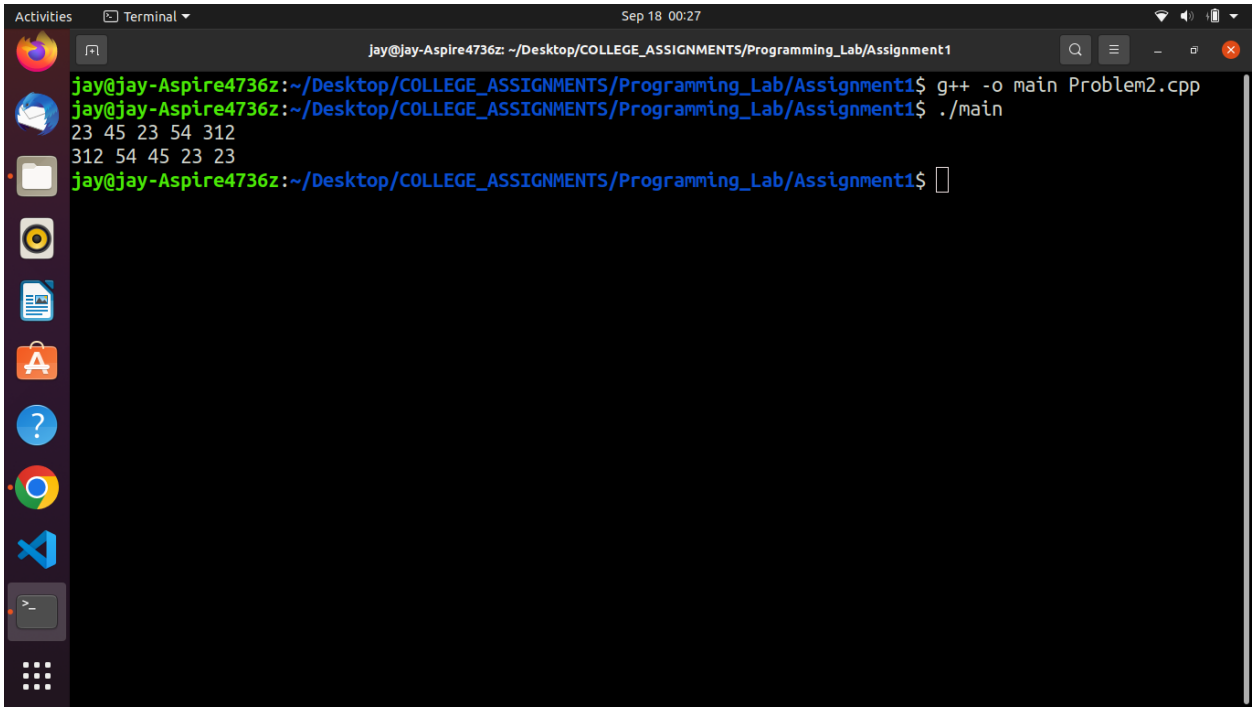

Activities
Terminal
Sep 18 00:24
jay@jay-Aspire4736z: ~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1
The entered data is :
Employee ID : 1
Name : Jay
Address : Sangil
Designation : Manager
Average Salary : 29000
Employee ID : 3
Name : Rahul
Address : Kupwad
Designation : SuperManager
Average Salary : 2.07014e+06
Employee ID : 34
Name : Tushar
Address : Latur
Designation : CEO
Average Salary : 9.1776e+07
Employee ID : 45
Name : Datta
Address : Solapur
Designation : CFO
Average Salary : 1.01839e+06
Employee ID : 46
Name : Viraj
Address : Unknown
Designation : Unmeasurable
Average Salary : 7.14012e+07

2.Write a program using class to accept 5 numbers from user and display largest, second largest and smallest, second smallest and middle number among five.

Code -

```
#include<iostream>
using namespace std;
class Prob2{
	int arr[5];
public:
	void input(){
		for(int i = 0; i < 5; ++i){
			cin >> arr[i];
		}
	}
	void sort(){
		for(int i = 0; i < 5; ++i){
			for(int j = i + 1; j < 5; ++j){
				if(arr[i] < arr[j]){
					int tmp = arr[i];
					arr[i] = arr[j];
					arr[j] = tmp;
				}
			}
		}
	}
	void output(){
		for(int i = 0; i < 5; ++i)
			cout << arr[i] << ' ' ;
		cout << endl;
	}
};
int main(){
	Prob2 p;
	p.input();
	p.sort();
	p.output();
}
```

Output -



3. Write a program to read 3 values of a, b and c and calculate value of X as

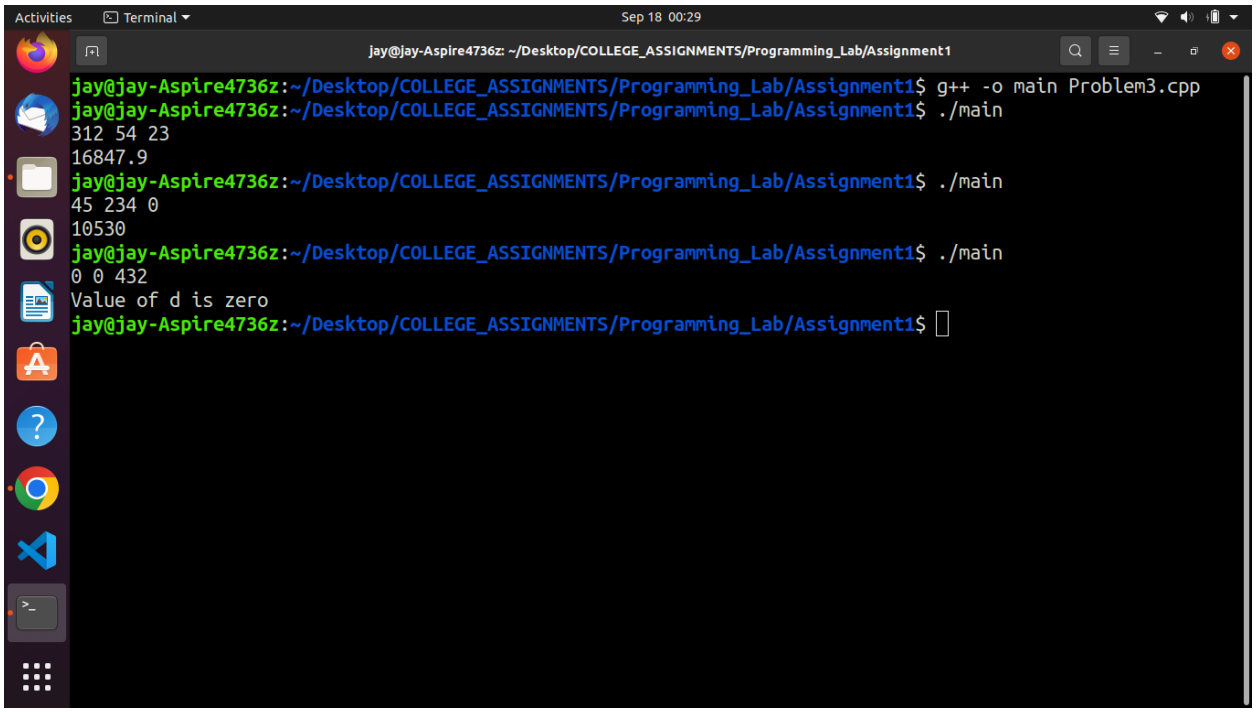
X= a*b – c/d
Where d=a+b

Code -

```
#include<iostream>
using namespace std;
int main(){
        double a, b, c, d;
        cin >> a >> b >> c;
        d = a + b;
        double x = a * b - (c / d);
        if(d == 0){
                cout << "Value of d is zero" << endl;
        }
        else{
                cout << x << endl;
```

```
        }
}
```

Output -



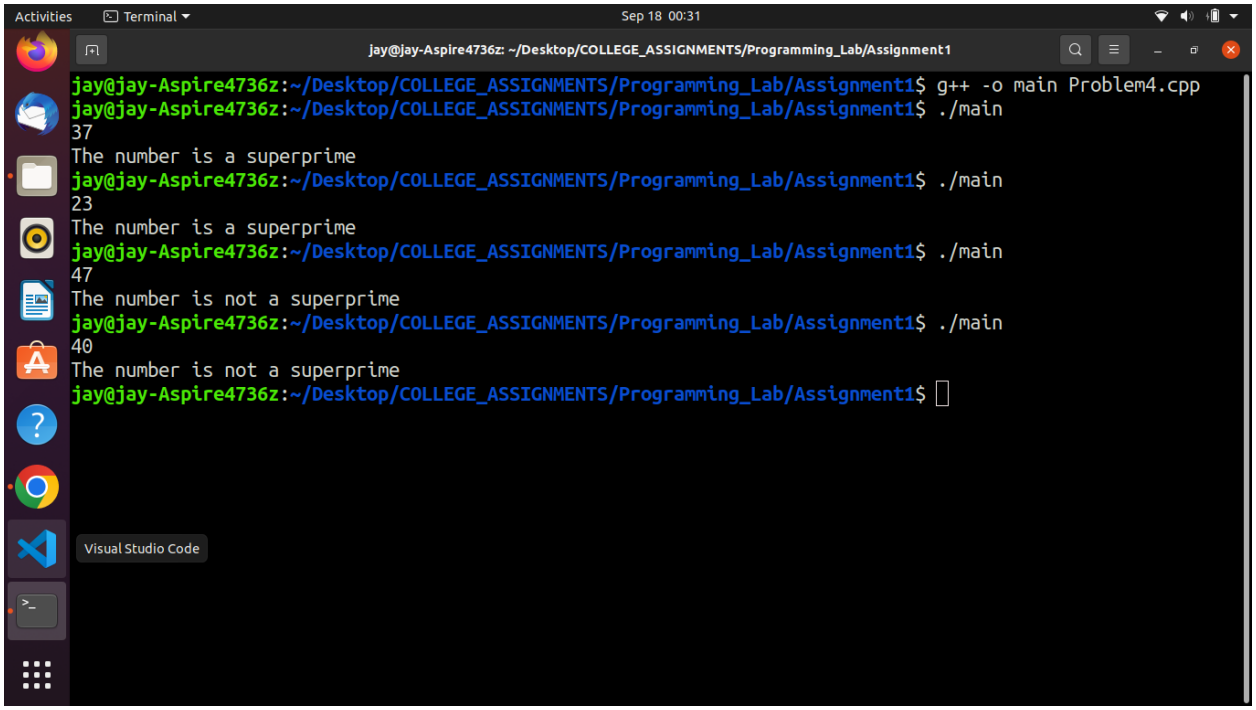
4.Write a CPP Program to Check given number is Super Prime number or not using
function.(Super prime number is one whose all digits are prime and number is also
prime)

CODE -

```
#include<iostream>
using namespace std;
bool is_prime(int n){
        bool ans = true;
        for(int i = 2; (i * i) <= n; ++i){
                if(n % i == 0)
                        ans = false;
        }
        return ans;
}
```

```
int main(){
	int n;
	cin >> n;
	bool flag = true;
	if(!is_prime(n)){
		flag = false;
	}else{
		int tmp = n;
		while(tmp){
			int digit = tmp % 10;
			tmp /= 10;
			if(!is_prime(digit)){
				flag = false;
				break ;
			}
		}
	}
	if(flag){
		cout << "The number is a superprime" << endl;
	}else{
		cout << "The number is not a superprime" << endl;
	}
}
```

OUTPUT -



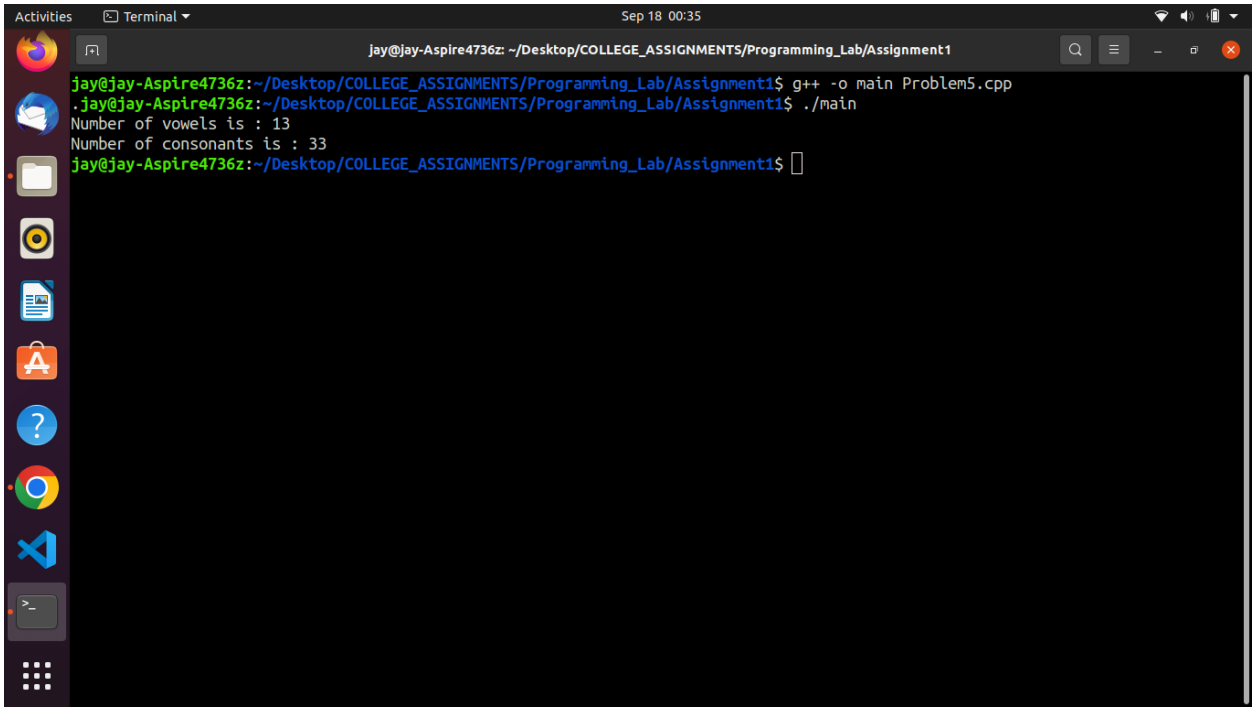
5.Write a CPP Program to Find Frequency (count) of vowels and consonants (character wise) in below String.
“CPP is easy and great and Python is also great”

CODE -

```
#include<iostream>
using namespace std;
bool is_vowel(char ch){
        char vowels[] = {'a', 'e', 'i', 'o', 'u'};
        bool ans = false;
        for(int i = 0; i < 5; ++i){
                if(ch == vowels[i]){
                        ans = true;
                }
        }
        return ans;
}
```

```
int main(){
        string s = "CPP is easy and great and Python is also great";
        int number_vowels = 0, number_consonants = 0;
        for(auto ch : s){
                if(is_vowel(ch)){
                        ++number_vowels;
                }else{
                        ++number_consonants;
                }
        }
        cout << "Number of vowels is : " << number_vowels << endl;
        cout << "Number of consonants is : " << number_consonants << endl;
}
```

OUTPUT -



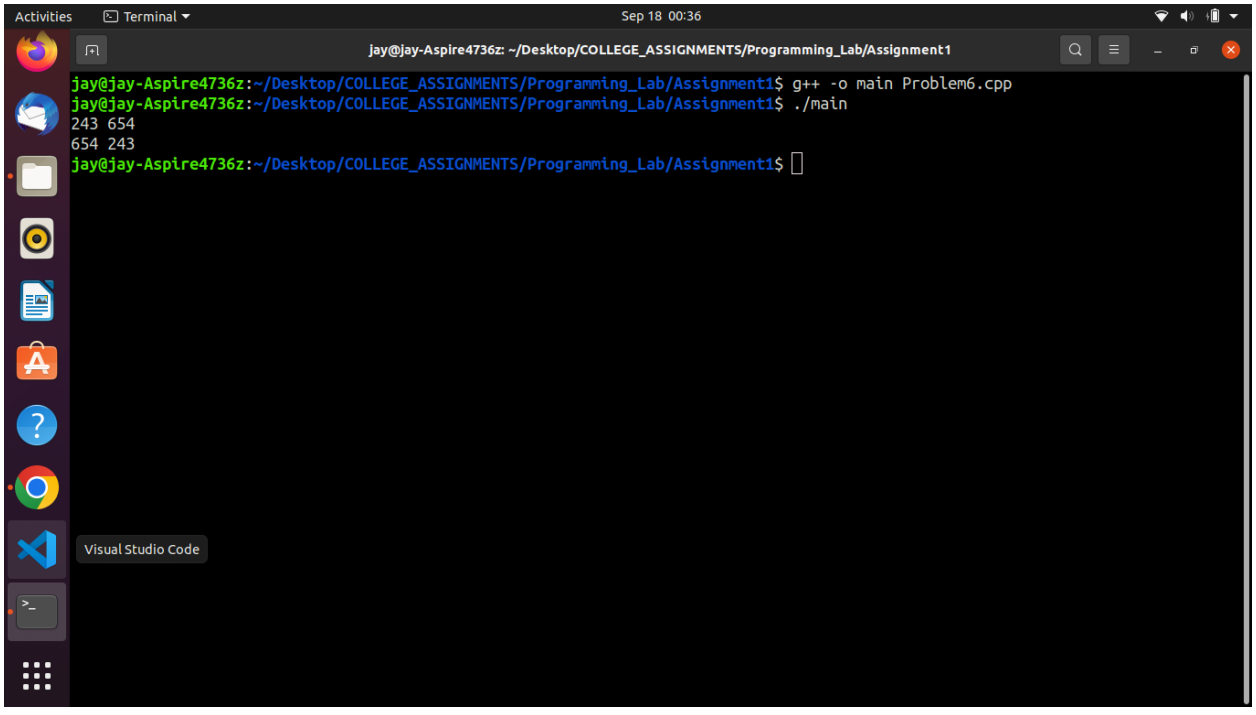
6. Write a program in CPP to swap 2 numbers without using any temporary variable.

CODE -

```
#include<iostream>
```

```
using namespace std;
void swap(int *a, int *b){
        int x = *a, y = *b;
        x = x ^ y;
        y = x ^ y;
        x = x ^ y;
        *a = x, *b = y;
}
int main(){
        int *a, *b;
        int x, y;
        cin >> x >> y;
        a = &x, b = &y;
        swap(a, b);
        cout << *a << ' ' << *b << endl;
}
```

OUTPUT -



7.Write a Menu driven CPP Program to perform below operations (use saperate functions
for every operation)

a. Binary to Octal
b. Octal to Binary
c. Binary to Hexadecimal
d. Hexadecimal to Binary
e. Octal to Hexadecimal
f. Hexadecimal to Octal

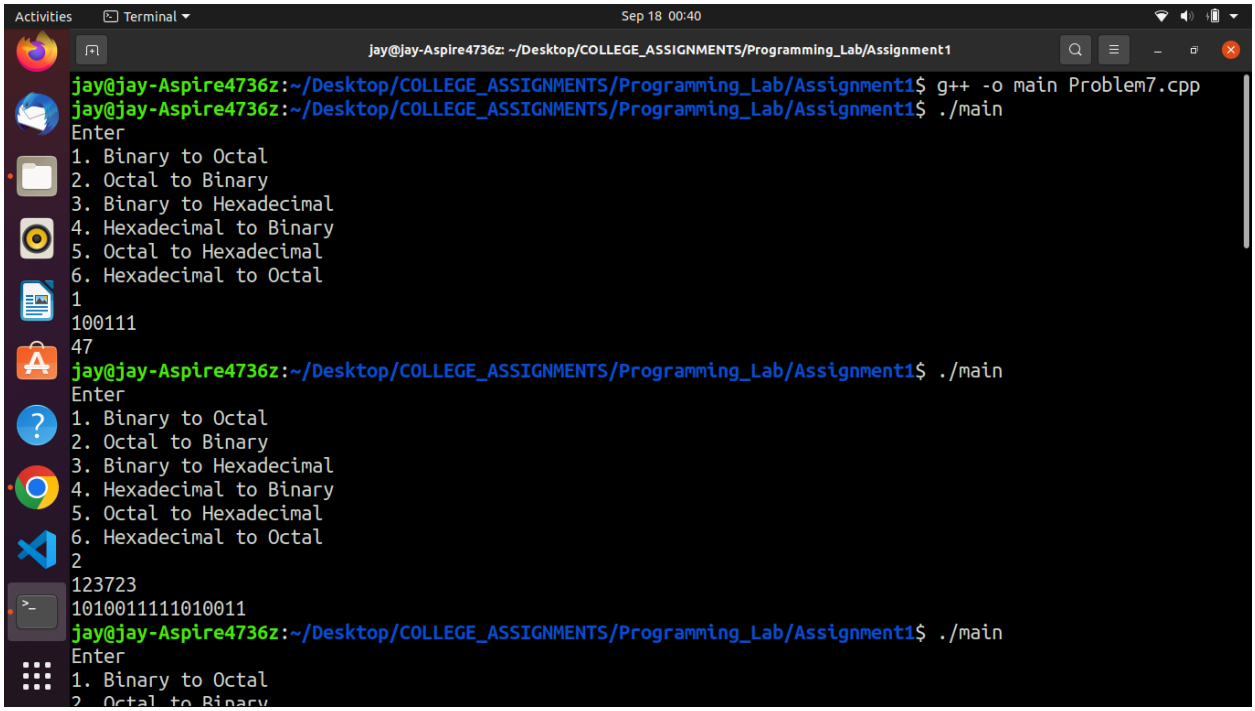
CODE -

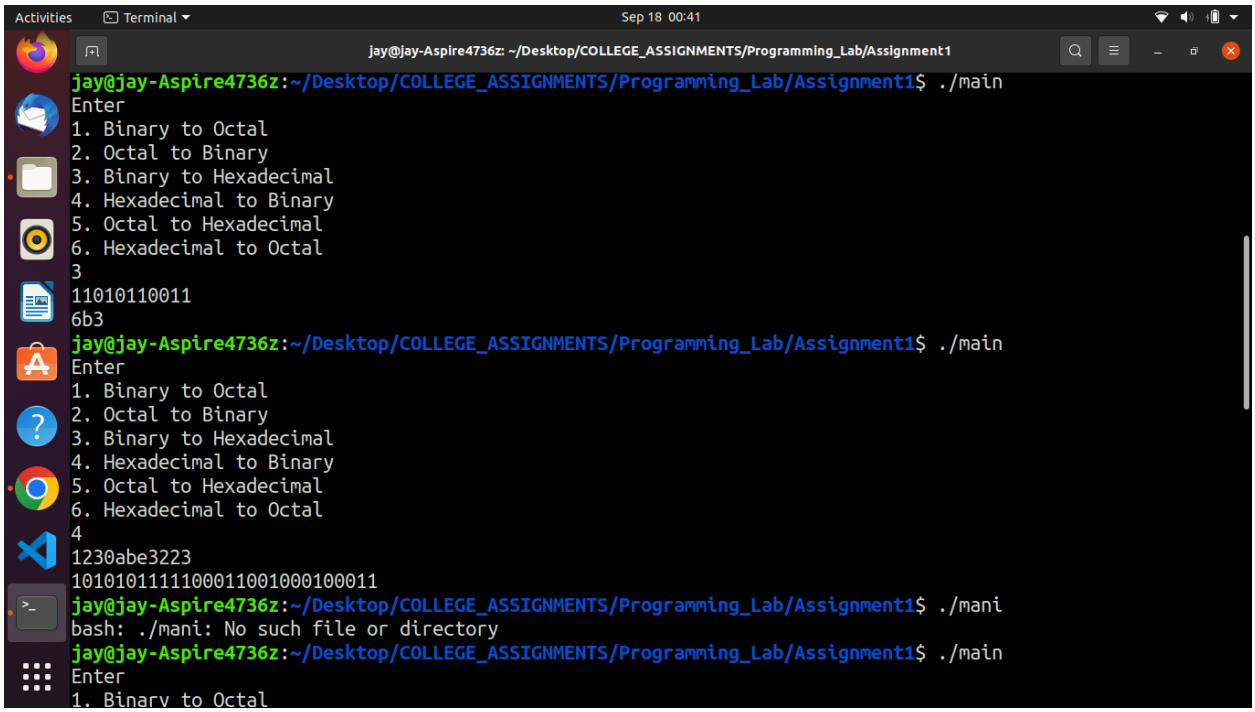
```
#include<iostream>
#include<string.h>
using namespace std;
int to_int(string s, int k){
	int n = 0;
	for(int i = 0; i < s.size(); ++i){
		n *= k;
		if(s[i] >= 'a'){
			n += s[i] - 'a' + 10;
		}else{
			n += s[i] - '0';
		}
	}
	return n;
}
string to_string(int n, int k){
	string s;
	while(n){
		if(n % k < 10){
			s.push_back('0' + (n % k));
		}else{
			s.push_back('a' + (n % k) - 10);
		}
		n /= k;
	}
	for(int i = 0; i < s.size() / 2; ++i){
		char tmp = s[s.size() - 1 - i];
		s[s.size() - 1 - i] = s[i];
		s[i] = tmp;
	}
```

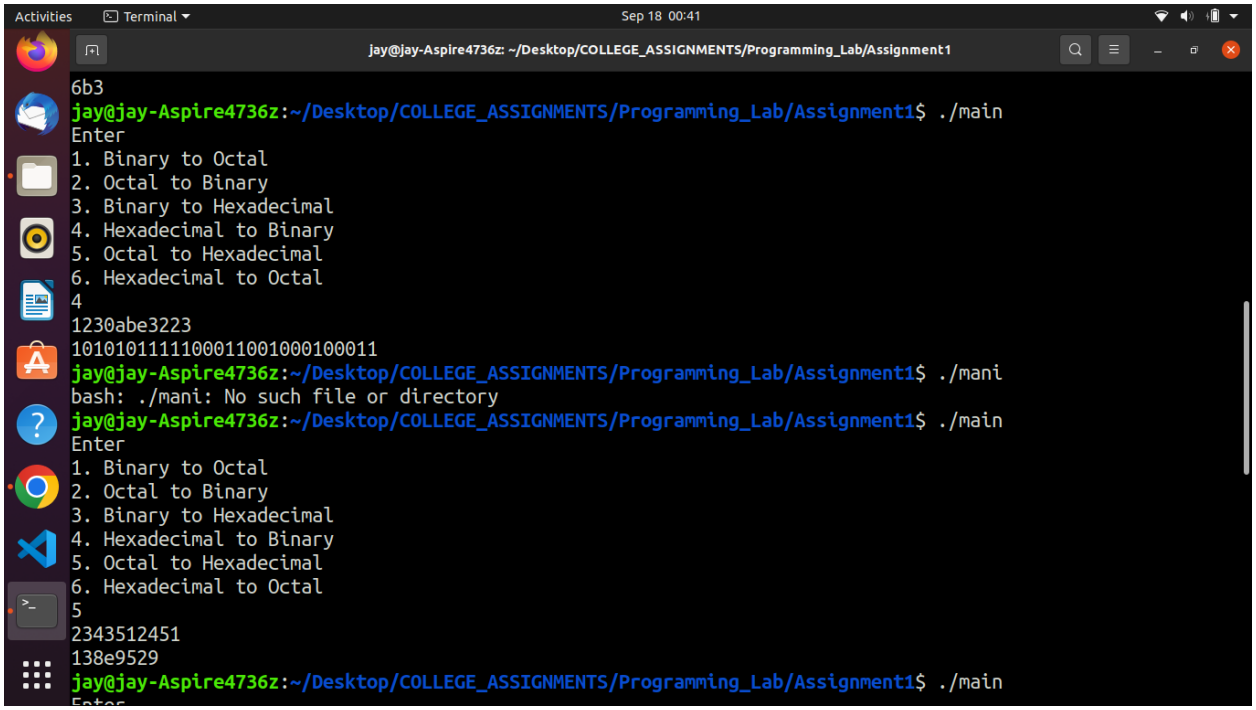
```
        return s;
}
int main(){
        cout << "Enter " << endl;
        cout << "1. Binary to Octal" << endl;
        cout << "2. Octal to Binary" << endl;
        cout << "3. Binary to Hexadecimal" << endl;
        cout << "4. Hexadecimal to Binary" << endl;
        cout << "5. Octal to Hexadecimal" << endl;
        cout << "6. Hexadecimal to Octal" << endl;
        int p, n, m;
        cin >> p;
        switch(p){
                case 1:
                        n = 2, m = 8;
                        break ;
                case 2:
                        n = 8, m = 2;
                        break ;
                case 3:
                        n = 2, m = 16;
                        break;
                case 4:
                        n = 16, m = 2;
                        break ;
                case 5:
                        n = 8, m = 16;
                        break;
                case 6:
                        n = 16, m = 8;
                        break;
        }
        string s;
        cin >> s;
        for(auto c : s){
                if(c >= 'a')
                        c = '0' + (c - 'a');
        }
        s = to_string(to_int(s, n), m);
        cout << s << endl;
```

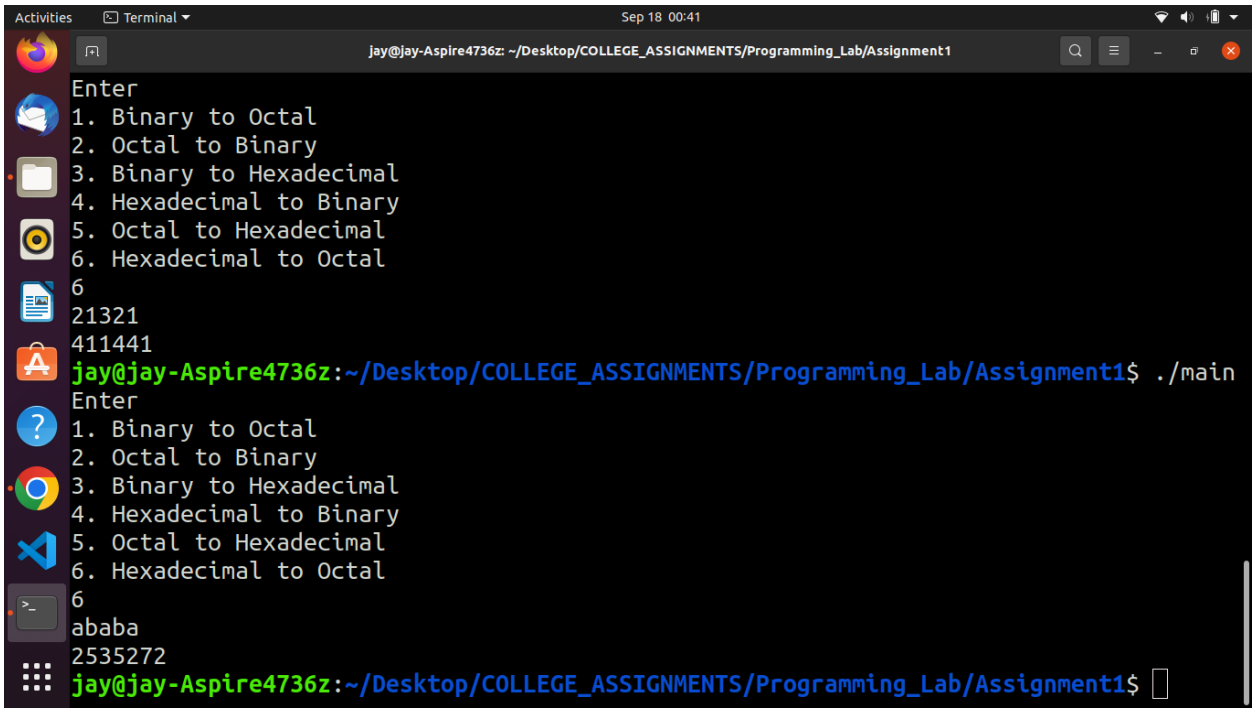
```
    return 0;
}
```

OUTPUT -






Activities
Terminal
Sep 18 00:41
jay@jay-Aspire4736z: ~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1
6b3
jay@jay-Aspire4736z:~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1$ ./main
Enter
1. Binary to Octal
2. Octal to Binary
3. Binary to Hexadecimal
4. Hexadecimal to Binary
5. Octal to Hexadecimal
6. Hexadecimal to Octal
4
1230abe3223
1010101111100011001000100011
jay@jay-Aspire4736z:~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1$ ./mani
bash: ./mani: No such file or directory
jay@jay-Aspire4736z:~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1$ ./main
Enter
1. Binary to Octal
2. Octal to Binary
3. Binary to Hexadecimal
4. Hexadecimal to Binary
5. Octal to Hexadecimal
6. Hexadecimal to Octal
5
2343512451
138e9529
jay@jay-Aspire4736z:~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1$ ./main


Activities
Terminal
Sep 18 00:41
jay@jay-Aspire4736z: ~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1
Enter
1. Binary to Octal
2. Octal to Binary
3. Binary to Hexadecimal
4. Hexadecimal to Binary
5. Octal to Hexadecimal
6. Hexadecimal to Octal
6
21321
411441
jay@jay-Aspire4736z:~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1$ ./main
Enter
1. Binary to Octal
2. Octal to Binary
3. Binary to Hexadecimal
4. Hexadecimal to Binary
5. Octal to Hexadecimal
6. Hexadecimal to Octal
6
ababa
2535272
jay@jay-Aspire4736z:~/Desktop/COLLEGE_ASSIGNMENTS/Programming_Lab/Assignment1$