Program 1:

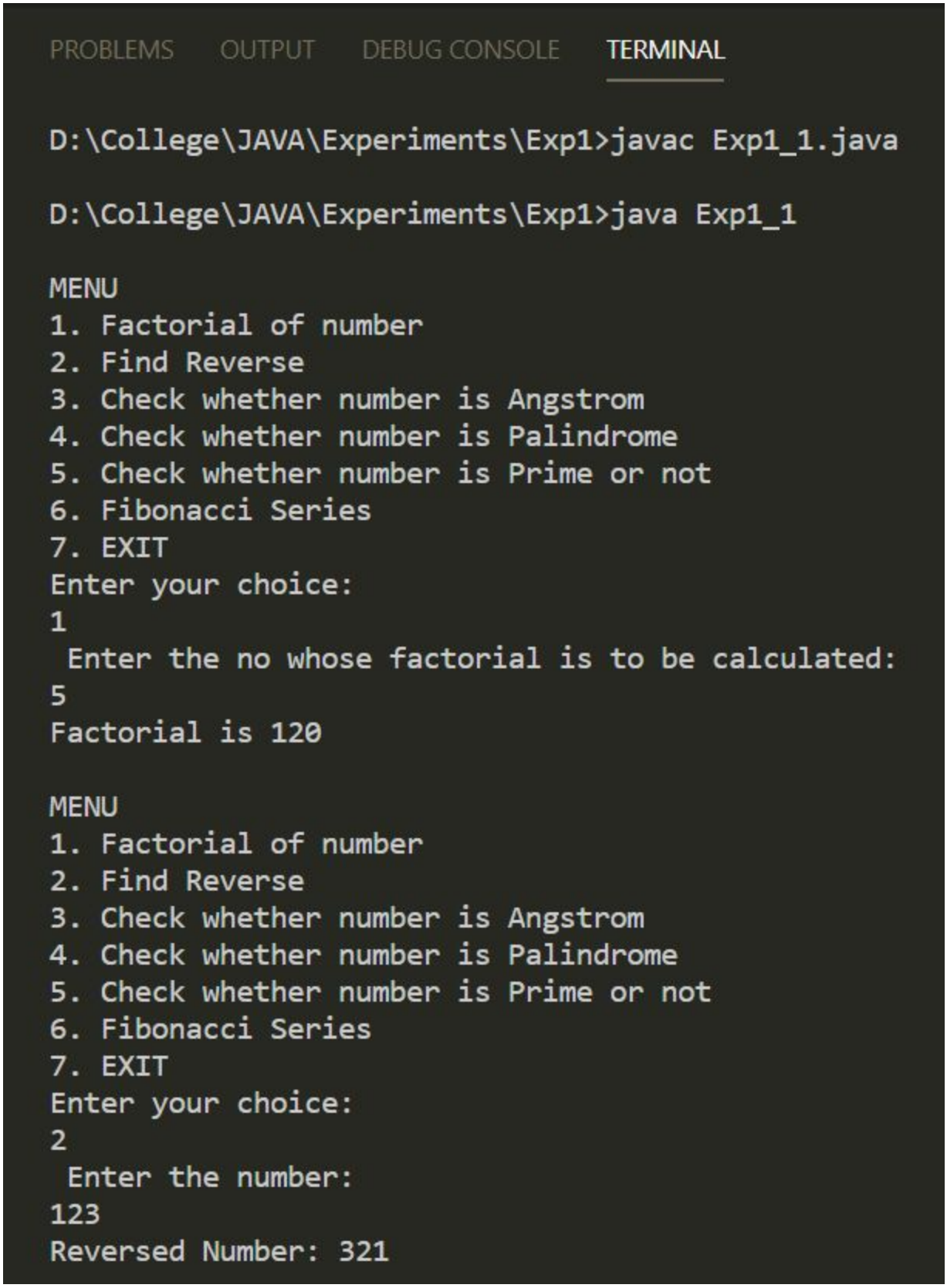
```
// Program to implement diff. functions through switch case
/**
 * i. Factorial()
ii. Reverse of a Number()
iii. Test Armstrong()
iv. Test Palindrome()
v. Test Prime()
vi. Fibonacci Series()
 */
package Exp1;
import java.util.Scanner;
public class Exp1_1
{
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        int ch,n;
        do {

            System.out.println("\nMENU ");
            System.out.println("1. Factorial of number ");
            System.out.println("2. Find Reverse ");
            System.out.println("3. Check whether number is Angstrom ");
            System.out.println("4. Check whether number is Palindrome ");
            System.out.println("5. Check whether number is Prime or not");
            System.out.println("6. Fibonacci Series ");
            System.out.println("7. EXIT ");
            System.out.println("Enter your choice: ");
            ch=sc.nextInt();

            switch(ch)
            {
                case 1:  //To find factorial
                {
                    System.out.println(" Enter the no whose factorial is to be
calculated: ");
                    n=sc.nextInt();
                    int fact=1;
```

```
                    while(n>0)
                    {
                        fact=n*fact;
                        n--;
                    }
                    System.out.println("Factorial is "+fact);
                    break;
                }
                case 2:   //To reverse a number
                {
                    System.out.println(" Enter the number: ");
                    n=sc.nextInt();
                    int reversed = 0;
                    while(n != 0) {
                        int digit = n % 10;
                        reversed = reversed * 10 + digit;
                        n /= 10;
                    }
                    System.out.println("Reversed Number: " + reversed);
                    break;
                }
                case 3: //To check Angstrom
                {
                    System.out.println(" Enter number to check whether Angstrom:
");
                    n=sc.nextInt();
                    int num=n,r,sum=0;
                    while(num!=0)
                    {
                        r=num%10;
                        sum=sum+(r*r*r);
                        num/=10;
                    }
                    if(n==sum)
                    System.out.println("Number is Angstrom. ");
                    else
                    System.out.println("Number is not Angstrom. ");
                    break;
                }
```

```
                case 4: //To check palindrome
                {
                    System.out.println(" Enter number to check whether
palindrome: ");
                    n=sc.nextInt();
                    int num=n,r,sum=0;
                    while(num!=0)
                    {
                        r=num%10;
                        sum=(sum*10)+r;
                        num/=10;
                    }
                    if(n==sum)
                    System.out.println("Number is Palindrome. ");
                    else
                    System.out.println("Number is not Palindrome. ");
                    break;
                }
                case 5:  //To check Prime number
                {
                    System.out.println(" Enter the number as prime or not ");
                    n=sc.nextInt();
                    int flag=0;
                    for(int i=2;i<n;i++)
                    {
                        if(n%i==0)
                        {
                            flag=1;
                            break;
                        }
                    }
                    if(flag==1)
                        System.out.println("Number is not prime ");
                    else
                        System.out.println("Number is prime ");
                    break;
                }
                case 6:  //To display n elements of Fibonacci series
                {
```

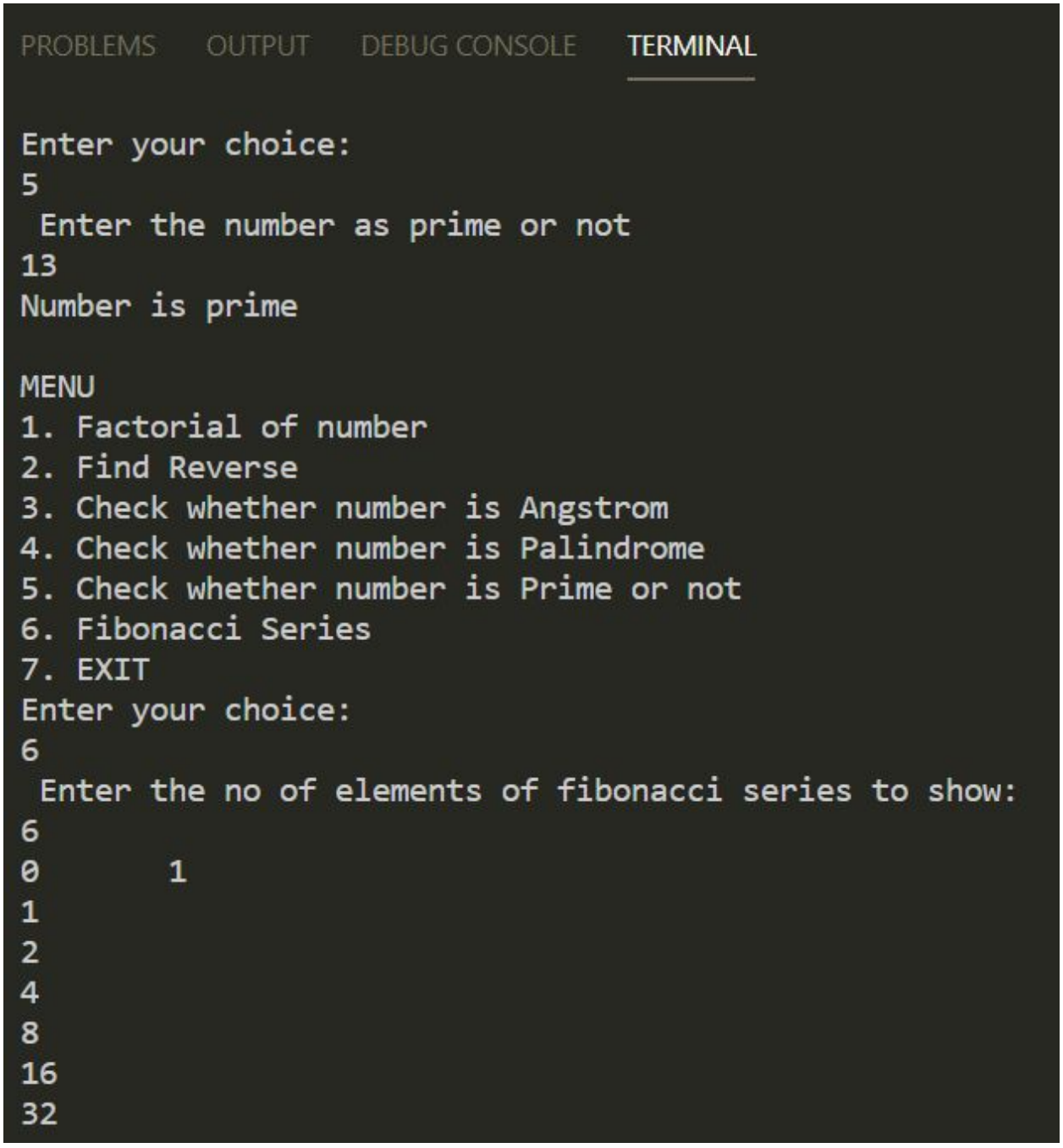
```
                    System.out.println(" Enter the no of elements of fibonacci
series to show: ");
                    n=sc.nextInt();
                    int a=0,b=1,c;
                    System.out.println("0\t1\t");
                    for(int i=1; i<=n; i++)
                    {
                        c=a+b;
                        System.out.println(c+"\t");
                        b=c;
                        a=b;
                    }
                    break;
                }
                case 7:{  //To Exit
                    System.out.println("Exitting.");
                }
                default:
                    System.out.println("INVALID CHOICE");
            }
        } while (ch!=7);
        sc.close();
    }
}
```

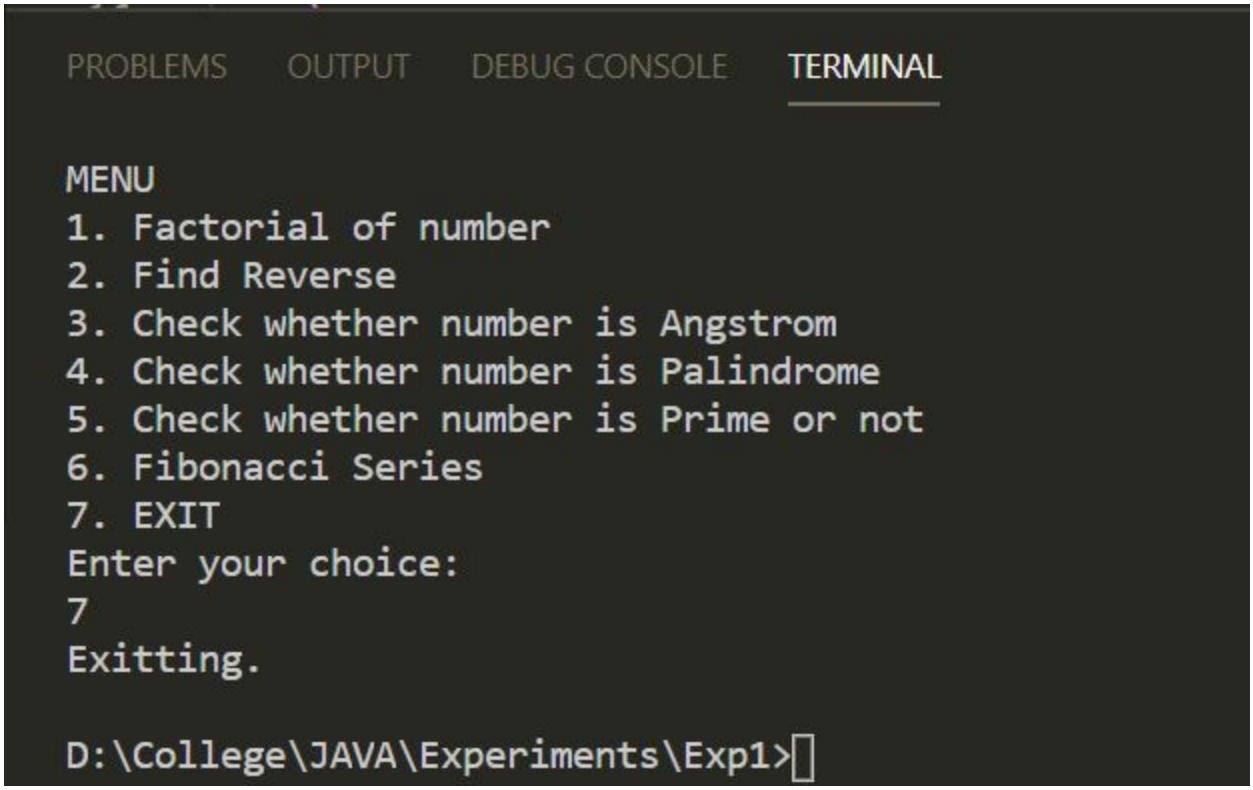
Output:


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
D:\College\JAVA\Experiments\Exp1>javac Exp1_1.java
D:\College\JAVA\Experiments\Exp1>java Exp1_1
MENU
1. Factorial of number
2. Find Reverse
3. Check whether number is Angstrom
4. Check whether number is Palindrome
5. Check whether number is Prime or not
6. Fibonacci Series
7. EXIT
Enter your choice:
1
Enter the no whose factorial is to be calculated:
5
Factorial is 120
MENU
1. Factorial of number
2. Find Reverse
3. Check whether number is Angstrom
4. Check whether number is Palindrome
5. Check whether number is Prime or not
6. Fibonacci Series
7. EXIT
Enter your choice:
2
Enter the number:
123
Reversed Number: 321

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
MENU
1. Factorial of number
2. Find Reverse
3. Check whether number is Angstrom
4. Check whether number is Palindrome
5. Check whether number is Prime or not
6. Fibonacci Series
7. EXIT
Enter your choice:
3
 Enter number to check whether Angstrom:
153
Number is Angstrom.

MENU
1. Factorial of number
2. Find Reverse
3. Check whether number is Angstrom
4. Check whether number is Palindrome
5. Check whether number is Prime or not
6. Fibonacci Series
7. EXIT
Enter your choice:
4
 Enter number to check whether palindrome:
121
Number is Palindrome.

MENU
1. Factorial of number
2. Find Reverse
3. Check whether number is Angstrom
4. Check whether number is Palindrome
5. Check whether number is Prime or not
6. Fibonacci Series
7. EXIT
```


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
Enter your choice:
5
Enter the number as prime or not
13
Number is prime
MENU
1. Factorial of number
2. Find Reverse
3. Check whether number is Angstrom
4. Check whether number is Palindrome
5. Check whether number is Prime or not
6. Fibonacci Series
7. EXIT
Enter your choice:
6
Enter the no of elements of fibonacci series to show:
6
0 1
1
2
4
8
16
32

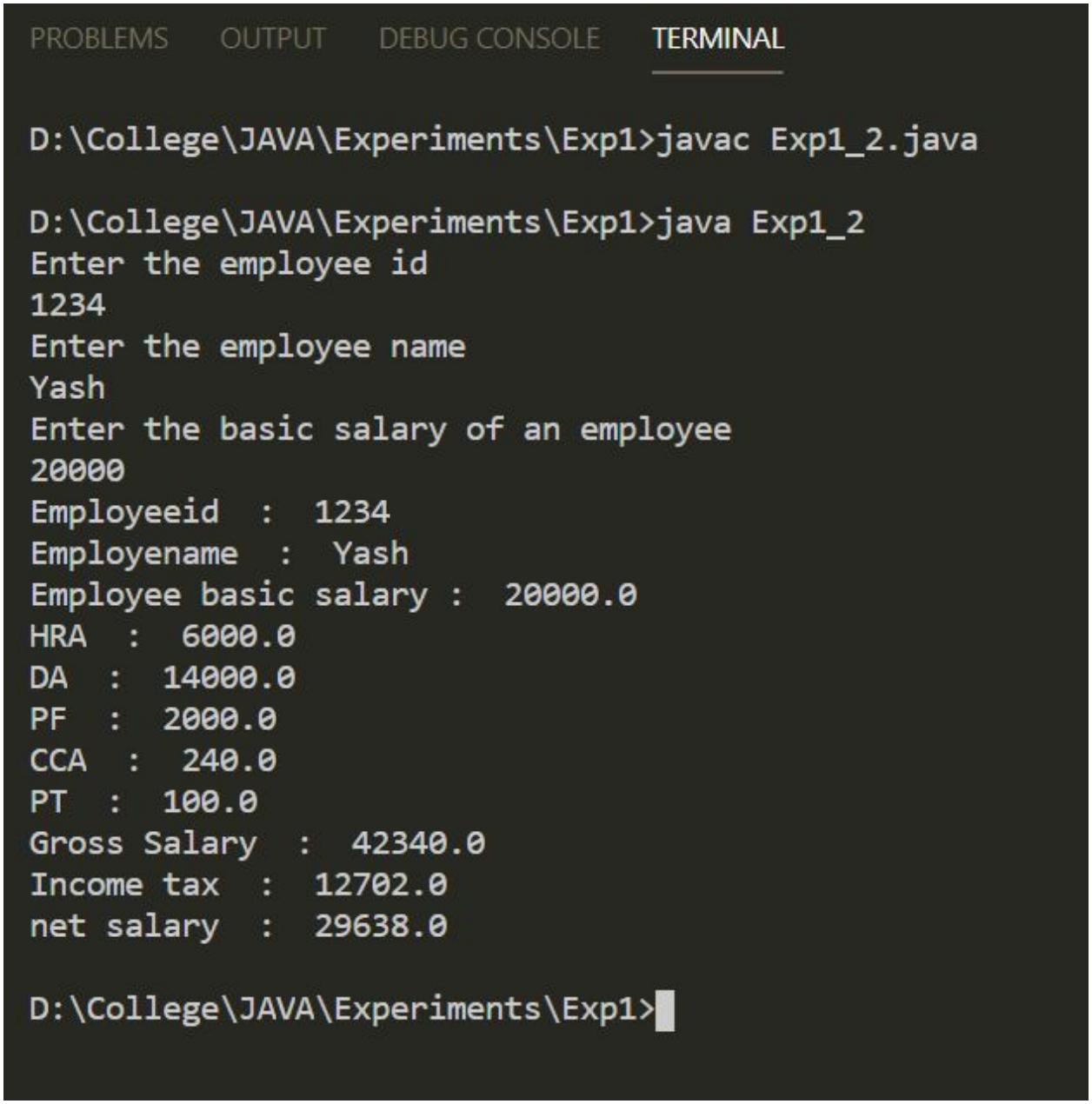

PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
MENU
1. Factorial of number
2. Find Reverse
3. Check whether number is Angstrom
4. Check whether number is Palindrome
5. Check whether number is Prime or not
6. Fibonacci Series
7. EXIT
Enter your choice:
7
Exitting.
D:\College\JAVA\Experiments\Exp1>

Program 2:

```
/**
 * Implement a java program to calculate gross salary & net salary taking the
following data.
Input: empno, empname, basic
Process:DA=70% of basic,HRA=30% of basic,CCA=Rs240/-,PF=10% of basic, PT= Rs100/-
 */

package Exp1;
import java.util.Scanner;
public class Exp1_2
{
     public int employeid;
     public String empname;
     public double basicsalary,HRA,DA,GS,PF,CCA=240, PT=100, incometax,netsalary;
     public void read()
     {
        Scanner scan= new Scanner(System.in);
        System.out.println("Enter the employee id");//taking all the inputs from
the user
        employeid=scan.nextInt();
        System.out.println("Enter the employee name");
        empname=scan.next();
        System.out.println("Enter the basic salary of an employee");
        basicsalary=scan.nextDouble();
        scan.close();
     }
     public void calculate()  //calculating all the parameters
     {
        HRA=(30*basicsalary)/100;
        DA=(70*basicsalary)/100;
        PF =(10*basicsalary)/100;
        GS=basicsalary+DA+HRA+PF+PT+CCA;
        incometax=(30*GS)/100;
        netsalary=GS-incometax;
    }
   public void display()  //displaying the calculating parameters
     {
        System.out.println("Employeeid   :  "+employeid);
```

```
        System.out.println("Employename  :  "+empname);
        System.out.println("Employee basic salary :  "+basicsalary);
        System.out.println("HRA  :  "+HRA);
        System.out.println("DA  :  "+DA);
        System.out.println("PF  :  "+PF);
        System.out.println("CCA  :  "+CCA);
        System.out.println("PT  :  "+PT);
        System.out.println("Gross Salary  :  "+GS);
        System.out.println("Income tax  :  "+incometax);
        System.out.println("net salary  :  "+netsalary);
      }

     public static void main(String args[])
     {
         Exp1_2 employeobj=new Exp1_2();
         employeobj.read(); //calling read function
    employeobj.calculate();
         employeobj.display(); //calling display function
     }
}
```

Output:


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
D:\College\JAVA\Experiments\Exp1>javac Exp1_2.java
D:\College\JAVA\Experiments\Exp1>java Exp1_2
Enter the employee id
1234
Enter the employee name
Yash
Enter the basic salary of an employee
20000
Employeeid : 1234
Employename : Yash
Employee basic salary : 20000.0
HRA : 6000.0
DA : 14000.0
PF : 2000.0
CCA : 240.0
PT : 100.0
Gross Salary : 42340.0
Income tax : 12702.0
net salary : 29638.0
D:\College\JAVA\Experiments\Exp1>

Questions

Question 1:

```java
/**
 * Write a Java program that counts number of alphabets, words, digits, special symbols and blank spaces in a given string.
 */

package Exp1;

import java.util.Scanner;
public class Q1 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter a string: ");

        String s = scanner.nextLine();
        count(s);

        scanner.close();
    }

    public static void count(String str){

        char [] ch = str.toCharArray();
        int letter=0, space = 0, digit = 0, other = 0, word=0;

        //To count number of words in a string by splitting the string at " "
        String[] words = str.split(" ");
        word = words.length;

        //To count the other parameters
        for (char c : ch) {
            if (Character.isLetter(c)) {
                letter ++;
            }
            else if(Character.isDigit(c)){
                digit ++;
            }
```

```
            else if(Character.isSpaceChar(c)){
                space ++;
            }
            else{
                other ++;
            }
        }
        //Displaying all the parameters
        System.out.println("String analysis: ");
        System.out.println("WORDS: " + word);
        System.out.println("LETTER: " + letter);
        System.out.println("DIGIT: " + digit);
        System.out.println("SPACE: " + space);
        System.out.println("OTHER CHARACTERS: " + other);
    }
}
```

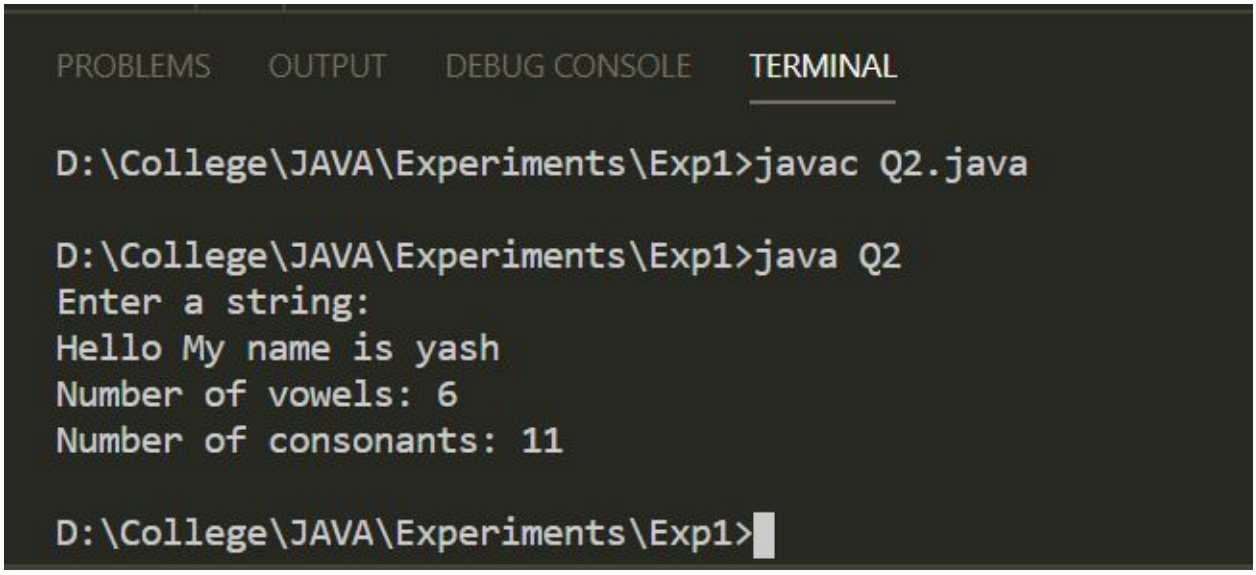
Output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

D:\College\JAVA\Experiments\Exp1>javac Q1.java

D:\College\JAVA\Experiments\Exp1>java Q1
Enter a string:
Hello World This is 1234@ @#$
String analysis:
WORDS: 6
LETTER: 16
DIGIT: 4
SPACE: 5
OTHER CHARACTERS: 4

D:\College\JAVA\Experiments\Exp1>
```

Question 2:

```java
/**
 * Write a Java program to count vowels and consonants in a given string.
 */

package Exp1;

import java.util.Scanner;
public class Q2 {
    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter a string:");
        String str = scanner.nextLine();
        count(str.toLowerCase());
        scanner.close();
    }

    public static void count(String str){

        int cCount =0, vCount=0;
        for (char c : str.toCharArray()) {
            //To count for vowels
            if(c=='a'||c=='e'||c=='i'||c=='o'||c=='u'){
                vCount++;
            }
            //To count for consonants
            else if(c>='a' && c<='z'){
                cCount++;
            }
        }
       //Displaying result
        System.out.println("Number of vowels: " + vCount);
        System.out.println("Number of consonants: " + cCount);

    }
}
```

Output:


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
D:\College\JAVA\Experiments\Exp1>javac Q2.java
D:\College\JAVA\Experiments\Exp1>java Q2
Enter a string:
Hello My name is yash
Number of vowels: 6
Number of consonants: 11
D:\College\JAVA\Experiments\Exp1>