Assignment – 1

Q1. Write a java program that will populate “This is my first Java Program”.

class Main {  
 public static void main(String[] args) {  
 System.*out*.println("This is my first Java Program");  
 }  
}

Output:

This is my first Java Program

Q2. Write a java program, that will take input as number and check it is even or odd.

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
  
 if (num % 2 == 0) {  
 System.*out*.println(num + " is even number");  
 } else {  
 System.*out*.println(num + " is odd number");  
 }  
 }  
}

Output:

Enter a number: 7  
7 is odd number

Q3. Write a java program that will populate your name 10 times. (Hints: Use for Loop)

class Main {  
 public static void main(String[] args) {  
 for (int i = 0; i < 10; i++) {  
 System.*out*.println("Swapnaraj Mohanty");  
 }  
 }  
}

Output:

Swapnaraj Mohanty  
Swapnaraj Mohanty  
Swapnaraj Mohanty  
Swapnaraj Mohanty  
Swapnaraj Mohanty  
Swapnaraj Mohanty  
Swapnaraj Mohanty  
Swapnaraj Mohanty  
Swapnaraj Mohanty  
Swapnaraj Mohanty

Q4. Write a Java program to test the inputted number is prime or composite.

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
  
 for (int i = 2; i <= num / 2; i++) {  
 if (num % i == 0) {  
 System.*out*.println(num + " is a composite number");  
 return;  
 }  
 }  
 System.*out*.println(num + " is a prime number");  
 }  
}

Output:

Enter a number: 7  
7 is a prime number

Q5. Write a java program that will compute GCD and LCM of two inputted numbers.

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter two numbers: ");  
 int num1 = sc.nextInt();  
 int num2 = sc.nextInt();  
 int gcd = 0;  
  
 for (int i = 1; i <= num1 && i <= num2; i++) {  
 if (num1 % i == 0 && num2 % i == 0) {  
 gcd = i;  
 }  
 }  
 int lcm = (num1 \* num2) / gcd;  
 System.*out*.println(gcd + " is the gcd and " + lcm + " is the lcm of " + num1 + " and " + num2);  
 }  
}

Output:

Enter two numbers: 10 20  
10 is the gcd and 20 is the lcm of 10 and 20

Q6. Write a Java program that will evaluate the exponential series.  
 i.e. e^x = 1 + x + x^2/2! + x^3/3! + ...

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter the exponent: ");  
 double x = sc.nextDouble();  
 System.*out*.print("Enter the no. of iterations:");  
 int itr = sc.nextInt();  
 double ex = 1;  
  
 for (int i = itr - 1; i > 0; i--) {  
 ex = 1 + (x / i) \* ex;  
 }  
 System.*out*.println("e^" + x + " = " + ex);  
 }  
}

Output:

Enter the exponent: 1  
Enter the no. of iterations:60  
e^1.0 = 2.718281828459045

Q7. Write a Java program that will evaluate the sin(x) series. (Hints Use Taylor series expansion)  
 i.e. sin(x) = x – x^3/3! + x^5/5! - ...

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter the sin argument: ");  
 double x = sc.nextDouble();  
 System.*out*.print("Enter the no. of iterations:");  
 int itr = sc.nextInt();  
 double sinx = 1;  
  
 for (int k = itr; k > 0; k--) {  
 int i = 2 \* k;  
 sinx = 1 - (x \* x) / (i \* (i + 1)) \* sinx;  
 }  
 System.*out*.println("sin(" + x + ") = " + sinx \* x);  
 }  
}

Output:

Enter the sin argument: 3.14159  
Enter the no. of iterations:60  
sin(3.14159) = 2.653589793877393E-6

Q8. Write a java program that will count the number of primes between 37 and 129.

class Main {  
 public static void main(String[] args) {  
 int composite = 0;  
  
 for (int num = 37; num <= 129; num++) {  
 for (int i = 2; i <= num / 2; i++) {  
 if (num % i == 0) {  
 composite++;  
 break;  
 }  
 }  
 }  
 int prime = (129 - 37 + 2) - composite;  
 System.*out*.println("Total number of primes in between 37 and 129 is " + prime);  
 }  
}

Output:

Total number of primes in between 37 and 129 is 21

Q9. Write a java program that will print the following patterns  
 1  
 1 2  
 1 2 3  
 1 2 3 4  
 1 2 3 4 5

import java.util.Scanner;   
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
  
 for (int i = 1; i <= num; i++) {  
 for (int j = 1; j <= i; j++) {  
 System.*out*.print(j + "\t");  
 }  
 System.*out*.println();  
 }  
 }  
}

Output:

Enter a number: 5  
1  
1 2  
1 2 3  
1 2 3 4  
1 2 3 4 5

Q10. Write a java program that will print the following patterns  
 \*  
 \* \* \*  
 \* \* \* \* \*  
 \* \* \* \* \* \* \*  
 \* \* \* \* \* \* \* \* \*

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
  
 for (int i = 1; i <= num; i++) {  
 for (int j = i + 1; j <= num; j++) {  
 System.*out*.print(" ");  
 }  
 for (int j = 1; j <= (i \* 2) - 1; j++) {  
 System.*out*.print("\* ");  
 }  
 System.*out*.println();  
 }  
 }  
}

Output:

Enter a number: 5  
 \*  
 \* \* \*  
 \* \* \* \* \*  
 \* \* \* \* \* \* \*  
\* \* \* \* \* \* \* \* \*

Q11. Write a program that find all the numbers that are coprime to a given number N and less than N. (Note: A pair(a, b) is said to be co-prime if gcd(a, b) = 1)

import java.util.Scanner;  
class Main {  
 public static int gcd(int num1, int num2) {  
 while (num2 != 0) {  
 int temp = num2;  
 num2 = num1 % num2;  
 num1 = temp;  
 }  
 return num1;  
 }  
  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
 System.*out*.print("All the co-primes of " + num + " and less than " + num + " are ");  
  
 for (int i = 1; i < num; i++) {  
 if (*gcd*(i, num) == 1) {  
 System.*out*.print(i + " ");  
 }  
 }  
 System.*out*.println();  
 }  
}

Output:

Enter a number: 20  
All the co-primes of 20 and less than 20 are 1 3 7 9 11 13 17 19

Q12. Given a number N. Write a program that find the number of co-prime pairs (a, b) from 1 to N such that their product(a\*b) is equal to N

import java.util.Scanner;  
class Main {  
 public static int gcd(int num1, int num2) {  
 while (num2 != 0) {  
 int temp = num2;  
 num2 = num1 % num2;  
 num1 = temp;  
 }  
 return num1;  
 }  
  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
 int cnt = 0;  
  
 for (int i = 1; i < num; i++) {  
 if (num % i == 0) {  
 int j = num / i;  
  
 if (i < j && *gcd*(i, j) == 1) {  
 cnt++;  
 }  
 }  
 }  
 System.*out*.println("Total number of co-primes pair from 1 to " + num + " whose product is equal to " + num + " is " + cnt);  
 }  
}

Output:

Enter a number: 20  
Total number of co-primes pair from 1 to 20 whose product is equal to 20 is 2

Q13. Write a program that find all factors of an inputted number N

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
 System.*out*.print("All the factors of " + num + " are ");  
  
 for (int i = 1; i <= num; i++) {  
 if (num % i == 0) {  
 System.*out*.print(i + " ");  
 }  
 }  
 System.*out*.println();  
 }  
}

Output:

Enter a number: 20  
All the factors of 20 are 1 2 4 5 10 20

Q14. Write a java program that will print a number in reverse order.

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
 int reversed = 0;  
  
 while (num != 0) {  
 reversed = reversed \* 10 + (num % 10);  
 num /= 10;  
 }  
 System.*out*.println("the reversed number is " + reversed);  
 }  
}

Output:

Enter a number: 1597  
the reversed number is 7951

Q15. Write a java program to determine whether the number is a palindrome

import java.util.Scanner;  
class Main {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
 int temp = num  
 int reversed = 0;  
  
 while (temp != 0) {  
 reversed = reversed \* 10 + (temp % 10);  
 temp /= 10;  
 }  
 if (num == reversed) {  
 System.*out*.println(num + " is a palindrome");  
 } else {  
 System.*out*.println(num + " is not a palindrome");  
 }  
 }  
}

Output:

Enter a number: 123321  
123321 is a palindrome