(1)
```
import java.util.*;
public class A07_Q1 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter your number: ");
int n = sc.nextInt(), num = n;
int count = 0;
while (n > 0) {
if ((n & 1) == 1) count++;
n = n >> 1; }
System.out.println("The number of one in the number " + num + " is " +
count); }}
```
(2)
```
import java.util.Scanner;
public class A07_Q2 {
public static int calculateParity(int num) {
int count = 0;
num = Math.abs(num);
while (num != 0) {
count ^= (num & 1);
num >>>= 1; }
return count; }
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter an integer: ");
int num = sc.nextInt();
int parity = calculateParity(num);
System.out.println("The parity of the number is: " + parity);
String result = (parity == 0) ? "The number of 1s is even." : "The number
of 1s is odd.";
System.out.println(result); }}
```
3)
```
import java.util.*;
public class A07_Q3 {
public static int swap(int n, int i, int j) {
if (((n >> i) & 1) != ((n >> j) & 1)) {
int bit = (1 << i) | (1 << j);
n ^= bit; }
return n; }
```

```
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter your number: ");
int n = sc.nextInt();
System.out.println("Enter the i-th position: ");
int i = sc.nextInt();
System.out.println("Enter the j-th position :");
int j = sc.nextInt();
System.out.println("No. after swapping the positions are :" + swap(n,i,j)); }}
```

4)

```
import java.util.Scanner;
public class A37_Q4 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter an 8-bit binary number: ");
String s = sc.next();
int n = Integer.parseInt(s, 2);
int reversed8Bit = 0;
for (int i = 0; i < 8; i++) {
reversed8Bit |= ((n >> i) & 1) << (7 - i); }
System.out.print("Original 8-bit word: ");
for (int i = 7; i >= 0; i--)
System.out.print((n >> i) & 1);
System.out.println();
System.out.print("Reversed 8-bit word: ");
for (int i = 7; i >= 0; i--) System.out.print((reversed8Bit >> i) & 1);
System.out.println(); } }
```

5)

```
import java.util.Scanner;
public class A37_Q5 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter your first number: ");
int num1 = sc.nextInt();
System.out.print("Enter your second number: ");
int num2 = sc.nextInt();
int originalNum1 = num1;
int originalNum2 = num2;
int ans = 0;
```

```
while (num2 > 0) {
if ((num2 & 1) == 1)
ans += num1;
num2 >>= 1;
num1 <<= 1; }
System.out.println("The multiplication of " + originalNum1 + " and " +
originalNum2 + " is " + ans); }}
```

6)
```
import java.util.Scanner;
public class A07_Q6 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter the dividend: ");
long a = sc.nextLong();
System.out.print("Enter the divisor: ");
long b = sc.nextLong();
if (a == Integer.MIN_VALUE && b == -1) {
System.out.println("Result: " + Integer.MAX_VALUE);
return; }
long originalA = a;
int sign = ((a < 0) ^ (b < 0)) ? -1 : 1;
a = Math.abs(a);
b = Math.abs(b);
long quotient = 0;
for (int i = 31; i >= 0; i--) {
if ((b << i) <= a) {
a -= (b << i);
quotient |= (1L << i); }}
System.out.printf("The result of dividing %d by %d is: %d%n", originalA,
sign * Math.abs(b), sign * quotient); }}
```

7)
```
import java.util.Scanner;
public class A07_Q7 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter the base number: ");
int base = sc.nextInt();
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System.out.println("Enter the exponent number: ");
int exp = sc.nextInt();
int originalBase = base;
int originalExp = exp;
int ans = 1;
int cur = base;
while (exp > 0) {
if ((exp & 1) == 1)
ans *= cur;
exp >>= 1;
cur *= cur; }
System.out.println("The result of " + originalBase + " raised to the power
of " + originalExp + " is " + ans); }}
8) import java.util.Scanner;
public class A57_Q8 {
public static int reverse(int num) {
int reversed = 0;
boolean isNegative = num < 0;
num = Math.abs(num);
while (num != 0) {
int lastDigit = num % 10;
reversed = (reversed << 3) + (reversed << 1) + lastDigit;
num /= 10; }
return isNegative ? -reversed : reversed; }
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.println("Enter a number to reverse: ");
int num = sc.nextInt();
int reversedNum = reverse(num);
System.out.printf("Reversed number: %d\n", reversedNum); }}
9)import java.util.Scanner;
public class A57_Q9 {
public static boolean isPalindrome(int num) {
if (num < 0)
return false;
int original = num;
int reversed = 0;
```

```
while (num != 0) {
int digit = num % 10;
reversed = (reversed << 3) + (reversed << 1) + digit;
num /= 10; }
return original == reversed; }

public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter a number to check if it's a palindrome: ");
int num = sc.nextInt();
if (isPalindrome(num)) {
System.out.println(num + " is a palindrome.");
} else {
System.out.println(num + " is not a palindrome."); }}}
10) import java.util.Scanner;
public class A37_Q10 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter the first float number: ");
float num1 = sc.nextFloat();
System.out.print("Enter the second float number: ");
float num2 = sc.nextFloat();
float epsilon = 1.0f;
float difference = Math.abs(num1 - num2);
if (difference < epsilon) {
System.out.printf("The difference between %f and %f is %f, which is
less than %f.%n", num1, num2, difference, epsilon);
} else {
System.out.printf("The difference between %f and %f is %f, which is
not less than %f.%n", num1, num2, difference, epsilon); }}
11)import java.util.Scanner;
public class A37_Q11 {
public static int countEvenDigits(int num) {
int count = 0;
num = Math.abs(num);
while (num != 0) {
int digit = num % 10;
```

```
if ((digit & 1) == 0)
count++;
num /= 10; }
return count; }
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter a number: ");
int num = sc.nextInt();
System.out.println("The number of even digits: " + countEvenDigits(num)); }}
```

12)

```
import java.util.Scanner;
public class A37_Q12 {
public static int extFTwodig(int num) {
while (num >= 100) {
num >>>= 1;
num /= 5; }
return num; }
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter the first number: ");
int num1 = sc.nextInt();
System.out.print("Enter the second number: ");
int num2 = sc.nextInt();
int firstTwoDigits = extFTwodig(num1);
int lastTwoDigits = num2 % 100;
int combinedNumber = firstTwoDigits * 100 + lastTwoDigits;

System.out.println("Combined number: " + combinedNumber); }}
```

13)

```
import java.util.Scanner;
public class A37_Q13 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter a number: ");
int num = sc.nextInt();
int[] frequency = new int[10];
num = Math.abs(num);
while (num != 0) {
int digit = num % 10;
```

```
frequency[digit]++;
num /= 10; }
System.out.println("Digit frequencies:");
for (int i = 0; i < 10; i++) {
System.out.printf("Digit %d: %d times%n", i, frequency[i]); }}}
14)import java.util.Scanner;
public class A37_Q14 {
public static boolean isPrime(int num) {
if (num <= 1)
return false;
for (int i = 2; i * i <= num; i = add(i, 1))
if ((num % i) == 0) return false;
return true; }
private static int add(int a, int b) {
while (b != 0) {
int carry = (a & b) << 1;
a ^= b;
b = carry; }
return a; }
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter a number to check if it's prime: ");
int num = sc.nextInt(); System.out.println(isPrime(num) ? num + " is prime." :
num + " is not prime."); }}
15)public class A37_Q15 {
private static boolean isPrime(int num) {
for (int i = 2; i * i <= num; i = add(i, 1))
if ((num % i) == 0)
return false;
return true; }
private static int add(int a, int b) {
while (b != 0) {
int carry = (a & b) << 1;
a ^= b;
b = carry; }
return a; }
public static void main(String[] args) {
```

```
System.out.println("The first 100 prime numbers are :");
for (int count = 0, num = 2; count < 100; num = add(num, 1)) {
if (isPrime(num)) {
System.out.print(num + (++count % 10 == 0 ? "\n" : ", "));
}}}}
16) import java.util.Scanner;
public class A37_Q16 {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter the number of prime numbers to display: ");
int numberOfPrimes = sc.nextInt();
for (int count = 0, num = 2; count < numberOfPrimes; num = add(num, 1)) {
if (isPrime(num)) {
System.out.print(num + (++count % 10 == 0 ? "\n" : " ")); }}}
private static boolean isPrime(int num) {
for (int i = 2; i * i <= num; i = add(i, 1))
if ((num % i) == 0)
return false;
return true; }
private static int add(int a, int b) {
while (b != 0) {
int carry = (a & b) << 1;
a ^= b;
b = carry; }
return a;
}}
17) import java.util.Scanner;
public class A37_Q17 {
public static boolean isEven(int num) {
return (num & 1) == 0; }
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.print("Enter a number to check if it's even: ");
int number = sc.nextInt();
System.out.println(number + " is " + (isEven(number) ? "even" : "odd")); }}
```