

**Name: Abinash Satapathy**

**Reg. no.: 16BCE0081**

**Slot: L33 + L34**

**Subject: Java Programming (CSE1007) Lab**

## **Experiment 1**

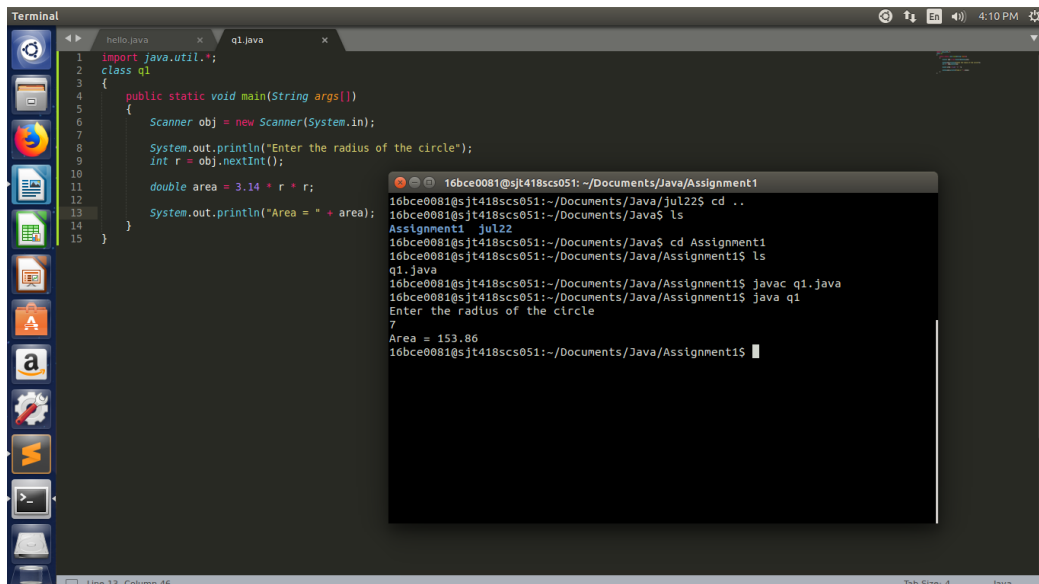
1. Read the radius and print the area of a circle

```
import java.util.*;
class q1
{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter the radius of the circle");
        int r = obj.nextInt();

        double area = 3.14 * r * r;

        System.out.println("Area = " + area);
    }
}
```



The screenshot shows a Java IDE with a file named 'q1.java' open. The code in the editor matches the code block above. Below the editor, a terminal window displays the execution output. The user enters the radius '7', and the program outputs 'Area = 153.86'.

```
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1
16bce0081@sjt418scs051: ~/Documents/Java/jul22$ cd ..
16bce0081@sjt418scs051: ~/Documents/Java$ ls
Assignment1  jul22
16bce0081@sjt418scs051: ~/Documents/Java$ cd Assignment1
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ ls
q1.java
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ javac q1.java
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ java q1
Enter the radius of the circle
7
Area = 153.86
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$
```

2. Read the number and check whether it is divisible by 3 and 5.

```
import java.util.*;
```

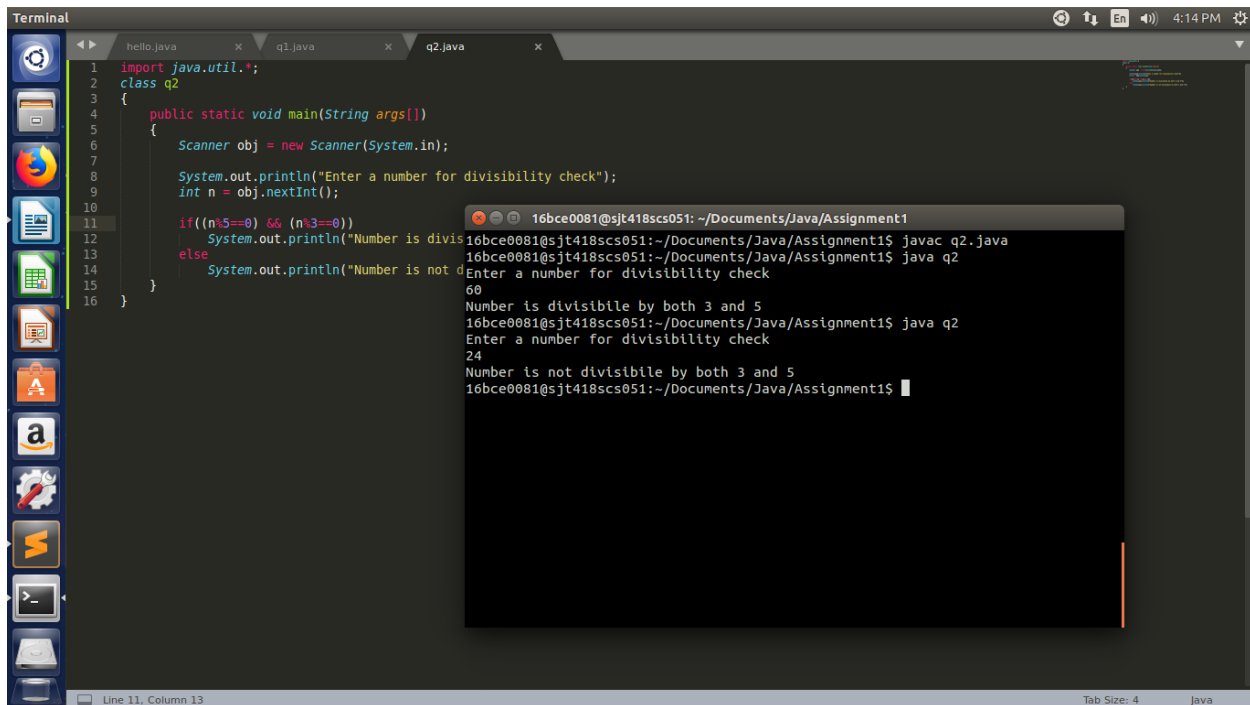
```

class q2
{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter a number for divisibility check");
        int n = obj.nextInt();

        if((n%5==0) && (n%3==0))
            System.out.println("Number is divisibile by both 3 and 5");
        else
            System.out.println("Number is not divisibile by both 3 and 5");
    }
}

```



The screenshot shows a Java IDE with a file named `q2.java` open. The code in the IDE matches the code block above. A terminal window is open, showing the compilation and execution of the program. The user enters `60` and `24` as input, and the program correctly outputs whether each number is divisible by both 3 and 5.

```

16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ javac q2.java
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q2
Enter a number for divisibility check
60
Number is divisibile by both 3 and 5
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q2
Enter a number for divisibility check
24
Number is not divisibile by both 3 and 5
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$

```

3. Display Subject Name based on room number. If the user enters 604 then display Java Programming, If the user enters 605 then display Python programming for any other input display Invalid input to the user

```

import java.util.*;
class q2
{

```

```

{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter 604 for Java Programming");
        System.out.println("Enter 605 for Python programming");

        int ch = obj.nextInt();

        switch(ch)
        {
            case 604:
                System.out.println("Java Programming");
                break;
            case 605:
                System.out.println("Python Programming");
                break;
            default:
                System.out.println("Wrong choice");
        }
    }
}

```

The screenshot shows a Java IDE with a code editor on the left and a terminal window on the right. The code editor displays the same Java code as shown in the previous block. The terminal window shows the execution of the program, including the compilation command `javac q3.java` and the execution command `java q3`. The output of the program is as follows:

```

16bce0081@sjt418scs051: ~/Documents/Java/Assignment1
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ javac q3.java
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q3
Enter 604 for Java Programming
Enter 605 for Python programming
604
Java Programming
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q3
Enter 604 for Java Programming
Enter 605 for Python programming
605
Python Programming
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q3
Enter 604 for Java Programming
Enter 605 for Python programming
456
Wrong choice
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$

```

4. Print the sum of first n numbers. If n is 3 then print the sum of 1+2+3 to the user. Get n from the user.

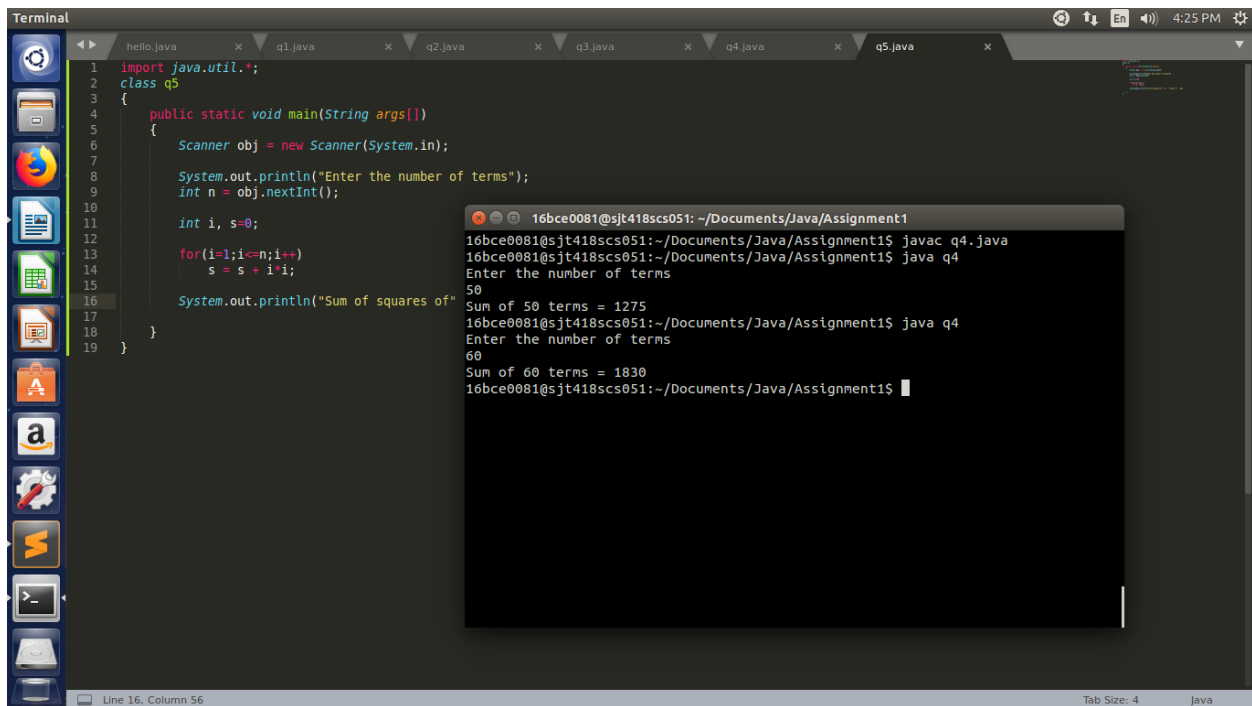
```
import java.util.*;
class q4
{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter the number of terms");
        int n = obj.nextInt();

        int i, s=0;

        for(i=1;i<=n;i++)
            s = s + i;

        System.out.println("Sum of " + n + " terms = " + s);
    }
}
```



The screenshot shows a Java IDE with a file explorer on the left and a code editor. The code editor displays the code for q4.java, which is identical to the code block above. A terminal window is open, showing the compilation and execution of the program. The terminal output is as follows:

```
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ javac q4.java
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q4
Enter the number of terms
50
Sum of 50 terms = 1275
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q4
Enter the number of terms
60
Sum of 60 terms = 1830
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$
```

5. Print the sum of the series  $1^2+2^2+3^2$  up to n terms

```
import java.util.*;
class q5
```

```

{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter the number of terms");
        int n = obj.nextInt();

        int i, s=0;

        for(i=1;i<=n;i++)
            s = s + i*i;

        System.out.println("Sum of squares of" + n + " terms = " + s);

    }
}

```

The screenshot shows a Java IDE with a file named `q5.java` open. The code in the editor is as follows:

```

1 import java.util.*;
2 class q5
3 {
4     public static void main(String args[])
5     {
6         Scanner obj = new Scanner(System.in);
7
8         System.out.println("Enter the number of terms");
9         int n = obj.nextInt();
10
11         int i, s=0;
12
13         for(i=1;i<=n;i++)
14             s = s + i*i;
15
16         System.out.println("Sum of squares of"
17     }
18 }
19

```

The output window shows the following execution results:

```

16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ javac q5.java
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ java q5
Enter the number of terms
50
Sum of squares of 50 terms = 42925
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ java q5
Enter the number of terms
10
Sum of squares of 10 terms = 385
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$

```

6. Print the multiplication table by getting the n from the user.

```

import java.util.*;
class q6
{
    public static void main(String args[])

```

```

{
    Scanner obj = new Scanner(System.in);

    System.out.println("Enter the Number whose table is to be displayed");

    int n = obj.nextInt();

    int i;

    for(i=1;i<=10;i++)
    {
        System.out.println(i + " x " + n + " = " + (i*n));
        System.out.println();
    }
}

```

The screenshot shows a Java IDE with a file explorer on the left and a code editor. The code editor displays the following code for `q6.java`:

```

1 import java.util.*;
2 class q6
3 {
4     public static void main(String args[])
5     {
6         Scanner obj = new Scanner(System.in);
7
8         System.out.println("Enter the Number whose table is to be displayed");
9
10        int n = obj.nextInt();
11
12        int i;
13
14        for(i=1;i<=10;i++)
15        {
16            System.out.println(i + " x " + n + " = " + (i*n));
17            System.out.println();
18        }
19    }
20 }
21

```

Below the code editor, a terminal window shows the execution of the program. The user enters the number 5, and the program displays the multiplication table for 5:

```

16bce0081@sjt418scs051: ~/Documents/Java/Assignment1
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q6
Enter the Number whose table is to be displayed
5
1 x 5 = 5
2 x 5 = 10
3 x 5 = 15
4 x 5 = 20
5 x 5 = 25
6 x 5 = 30
7 x 5 = 35
8 x 5 = 40
9 x 5 = 45
10 x 5 = 50
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$

```

7. Provide the option of adding two numbers to the user until the user wants to exit.

```

import java.util.*;
class q7
{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);
    }
}

```

```

int ch = 1;

int a, b;

while(ch!=0)
{
    System.out.println("Enter 2 numbers to add.");

    a = obj.nextInt();
    b = obj.nextInt();

    System.out.println("Sum of "+a+" and "+b+" = "+ (a+b));

    System.out.println();
    System.out.println("Enter 0 to exit");
    ch = obj.nextInt();
}
}
}

```

The screenshot shows an IDE with a Java file named q7.java. The code is a class q7 with a main method that uses a Scanner to read input. It prompts the user to enter two numbers, calculates their sum, and prints it. It also prompts the user to enter 0 to exit. The output window shows the execution of the program, demonstrating the sum of 2 and 3 (5), 6 and 54 (60), and 8 and 9 (17).

```

1 import java.util.*;
2 class q7
3 {
4     public static void main(String args[])
5     {
6         Scanner obj = new Scanner(System.in);
7
8         int ch = 1;
9
10        int a, b;
11
12        while(ch!=0)
13        {
14            System.out.println("Enter 2 numbers to add.");
15
16            a = obj.nextInt();
17            b = obj.nextInt();
18
19            System.out.println("Sum of "+a+" and "+b+" = "+ (a+b));
20
21            System.out.println();
22            System.out.println("Enter 0 to exit");
23            ch = obj.nextInt();
24        }
25    }
26 }

```

```

16bce0081@sjt418scs051: ~/Documents/Java/Assignment1
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ javac q7.java
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q7
Enter 2 numbers to add.
2
3
Sum of 2 and 3 = 5
Enter 0 to exit
4
Enter 2 numbers to add.
6
54
Sum of 6 and 54 = 60
Enter 0 to exit
3
Enter 2 numbers to add.
8
9
Sum of 8 and 9 = 17
Enter 0 to exit
0
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$

```

8. (a)

```

*
**
***
****

```

```

import java.util.*;
class q8_1
{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);

        int i, j;

        for(i=1;i<=4;i++)
        {
            for(j=1;j<=i;j++)
                System.out.print("* ");
            System.out.println("\n");
        }
    }
}

```

The screenshot shows a Java IDE with a terminal window. The code in the background matches the code block above. The terminal window shows the following output:

```

16bce0081@sjt418scs051: ~/Documents/Java/Assignment1
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ javac q8_1.java
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ java q8_1
*
* *
* * *
* * * *
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$

```

(b)

1234

123

12

1

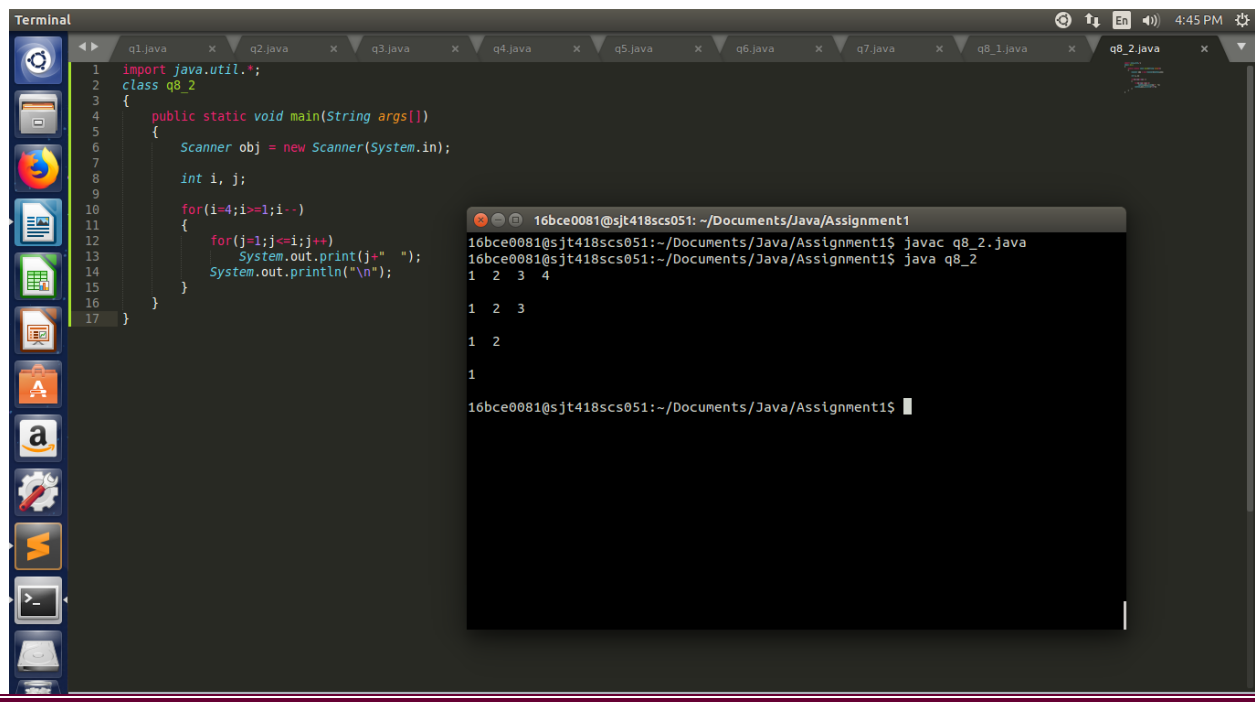


```
import java.util.*;

class q8_2
{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);

        int i, j;

        for(i=4;i>=1;i--)
        {
            for(j=1;j<=i;j++)
                System.out.print(j+" ");
            System.out.println("\n");
        }
    }
}
```



The screenshot shows a Java IDE with a dark theme. The main editor window displays the Java code for the class `q8_2`. The code uses nested loops to print a pattern of numbers. The output window shows the result of running the program, which is a pattern of numbers printed on four lines. The first line has four numbers (1 2 3 4), the second has three (1 2 3), the third has two (1 2), and the fourth has one (1). The IDE's title bar shows the file name `q8_2.java` and the current time is 4:45 PM.

```
Terminal
q1.java x q2.java x q3.java x q4.java x q5.java x q6.java x q7.java x q8_1.java x q8_2.java x
1 import java.util.*;
2 class q8_2
3 {
4     public static void main(String args[])
5     {
6         Scanner obj = new Scanner(System.in);
7
8         int i, j;
9
10        for(i=4;i>=1;i--)
11        {
12            for(j=1;j<=i;j++)
13                System.out.print(j+" ");
14            System.out.println("\n");
15        }
16    }
17 }
```

```
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ javac q8_2.java
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$ java q8_2
1 2 3 4
1 2 3
1 2
1
16bce0081@sjt418scs051:~/Documents/Java/Assignment1$
```

(c)

1  
12  
123  
1234  
1234  
123  
12  
1

```
import java.util.*;
class q8_3
{
    public static void main(String args[])
    {
        Scanner obj = new Scanner(System.in);

        int i, j;

        for(i=1;i<=4;i++)
        {
            for(j=1;j<=i;j++)
                System.out.print(j+" ");
            System.out.println("\n");
        }
    }
}
```

```

        for(i=4;i>=1;i--)
        {
            for(j=1;j<=i;j++)
                System.out.print(j+" ");
            System.out.println("\n");
        }
    }
}

```

The screenshot shows a Java IDE with a file explorer on the left and a code editor. The code editor contains the following code:

```

1 import java.util.*;
2 class q8_3
3 {
4     public static void main(String args[])
5     {
6         Scanner obj = new Scanner(System.in);
7
8         int i, j;
9
10        for(i=1;i<=4;i++)
11        {
12            for(j=1;j<=i;j++)
13                System.out.print(j+" ");
14            System.out.println("\n");
15        }
16
17        for(i=4;i>=1;i--)
18        {
19            for(j=1;j<=i;j++)
20                System.out.print(j+" ");
21            System.out.println("\n");
22        }
23    }
24 }

```

Below the code editor, there is a terminal window showing the execution of the program. The terminal output is as follows:

```

16bce0081@sjt418scs051: ~/Documents/Java/Assignment1
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ javac q8_3.java
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$ java q8_3
1
1 2
1 2 3
1 2 3 4
1 2 3 4
1 2 3
1 2
1
16bce0081@sjt418scs051: ~/Documents/Java/Assignment1$

```

## Experiment – 2

1. Write a Java program to sort an array of positive integers of an given array, in the sorted array the value of the first element should be maximum, second value should be minimum value, third should be second maximum, fourth second be second minimum and so on.

```

import java.util.*;
class q1
{

```

```
public static void main(String args[])
{
    Scanner obj = new Scanner(System.in);

    int i, j;

    System.out.println("Enter Number of elements");
    int n = obj.nextInt();
    int a[] = new int[n];

    for(i=0;i<n;i++)
        a[i] = obj.nextInt();

    int temp = 0;

    for(i=0;i<n-1;i++)
    {
        for(j=0;j<n-1;j++)
        {
            if(a[j]<=a[j+1])
            {
                temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }
        }
    }

    System.out.println("\nSorted Array.");
    for(i=0;i<n;i++)
        System.out.print(a[i]+" ");
    System.out.println("\n\n");

    int b[] = new int[n];

    for(i=0;i<n;i++)
        b[i] = a[n-i-1];

    int c[] = new int[n];

    j = 0;
    int k=0;

    for(i=0;i<n;i++)
    {
        if(i%2==0)
```

```

        {
            c[i] = a[j];
            j++;
        }

        else
        {
            c[i] = b[k];
            k++;
        }
    }
}

```

System.out.println("\nSorted Array in which first element should be maximum, second value should be minimum value, third should be second maximum, fourth second be second minimum and so on.");

```
for(i=0;i<n;i++)
```

```
System.out.print(c[i]+" ");
```

```
System.out.println("\n\n");
```

```
}
```

```
}
```

The screenshot shows a Java IDE with a file named `q1.java`. The code implements a sorting algorithm that interleaves elements from two arrays, `a` and `b`, into a new array `c`. Array `a` is sorted in descending order, and array `b` is sorted in ascending order. The resulting array `c` contains elements from `a` and `b` in an alternating fashion, starting with the maximum element of `a`.

The terminal window shows the following output:

```

16bce0081@sjt418scs051: ~/Documents/Java/Assignment2
16bce0081@sjt418scs051:~/Documents/Java/Assignment2$ javac q1.java
16bce0081@sjt418scs051:~/Documents/Java/Assignment2$ java q1
Enter Number of elements
5
10
20
30
40
50

Sorted Array.
50 40 30 20 10

Sorted Array in which first element should be maximum, second value should be minimum value, third should be second maximum, fourth second be second minimum and so on.
50 10 40 20 30

16bce0081@sjt418scs051:~/Documents/Java/Assignment2$

```

2. Write a Java program to separate even and odd numbers of an given array of integers. Put all even numbers first, and then odd numbers.

```
import java.util.*;
class q2
{
    public static void main(String[] args) {

        Scanner obj = new Scanner(System.in);

        int num = 0;
        System.out.println("Enter the number of elements in the array.");
        int n = obj.nextInt();
        int a[] = new int[n];
        int b[] = new int[n];
        int i;

        for(i=0;i<n;i++)
        {
            System.out.println("Enter a number.");
            num = obj.nextInt();

        }

        for(i=0;i<n;i++)
        {
            if(a[i]%2==0)
                b[i] = a[i];
            else
                b[n-i-1] = a[i];
        }

        System.out.println("\n");
        System.out.println("The modified array is as follows:-\n\n");
        for(i=0;i<n;i++)
            System.out.print(b[i]+" ");

        System.out.println();

    }
}
```

```
1 import java.util.*;
2 class q2
3 {
4     public static void main(String[] args) {
5
6         Scanner obj = new Scanner(System.in);
7
8         int num = 0;
9         System.out.println("Enter the number of elements in the array.");
10        int n = obj.nextInt();
11        int a[] = new int[n];
12        int b[] = new int[n];
13        int i;
14
15        for(i=0;i<n;i++)
16        {
17            System.out.println("Enter a number.");
18            num = obj.nextInt();
19        }
20
21        for(i=0;i<n;i++)
22        {
23            if(a[i]%2==0)
24                b[i] = a[i];
25            else
26                b[n-i-1] = a[i];
27        }
28
29        System.out.println("\n");
30        System.out.println("The modified array is as follows:-");
31        for(i=0;i<n;i++)
32            System.out.print(b[i]+" ");
33
34        System.out.println();
35    }
36 }
```

Terminal Output:

```
bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $ ls
1.png q3.class
7A11SEP2019-20_CSE1007_EIA_VI_2019201002216_Reference_Material_1_24-Jul-2019_Programbased_on_Array.pdf q3.java
q1.class q4.class
q2.class q4.java
q2.java q5.java
bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $ javac q2.java
bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $ java q2
Enter the number of elements in the array.
5
Enter a number.
10
Enter a number.
56
Enter a number.
45
Enter a number.
23
Enter a number.
78
The modified array is as follows:-
0 0 0 0 0
```

3. Write a Java program to remove the duplicate elements of a given array and return the new length of the array.

```
import java.util.*;
class q3
{
    public static void main(String[] args) {

        Scanner obj = new Scanner(System.in);

        System.out.println("Enter number of array elements.");
        int n = obj.nextInt();

        int i, j;
        int a[] = new int[n];

        for(i=0;i<n;i++)
        {
            System.out.println("Enter a number.");
            a[i] = obj.nextInt();
        }

        int temp = 0;
```

```

        for(i=0;i<n;i++)
        {
            for(j=0;j<n-1;j++)
            {
                if(a[j]>=a[j+1])
                {
                    temp = a[j];
                    a[j] = a[j+1];
                    a[j+1] = temp;
                }
            }
        }

        int count=0, l = 0;

        for(i=0;i<n-1;i++)
        {
            if(a[i]==a[i+1])
            {
                count++;
            }

            else
                l++;
        }

        System.out.println("\nLength of new array = "+l);
    }
}

```



The screenshot shows a Sublime Text editor window with a Java file named q3.java. The code implements a bubble sort algorithm on an array of integers. It prompts the user to enter the number of array elements and then the elements themselves. After sorting, it prints the length of the new array. An output window in the foreground shows the execution results, including the input values and the final sorted array length.

```

12  int a[] = new int[n];
13
14  for(i=0;i<n;i++)
15  {
16      System.out.println("Enter a number.");
17      a[i] = obj.nextInt();
18  }
19
20  int temp = 0;
21
22  for(i=0;i<n;i++)
23  {
24      for(j=0;j<n-1;j++)
25      {
26          if(a[j]>a[j+1])
27          {
28              temp = a[j];
29              a[j] = a[j+1];
30              a[j+1] = temp;
31          }
32      }
33  }
34
35  int count=0, l = 0;
36
37  for(i=0;i<n-1;i++)
38  {
39      if(a[i]==a[i+1])
40      {
41          count++;
42      }
43
44      else
45          l++;
46  }
47
48  System.out.println("\nLength of new array = "+l);
49
50  }

```

Output window content:

```

bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2
bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $ javac q3.java
bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $ java q3
Enter number of array elements.
10
Enter a number.
2
Enter a number.
2
Enter a number.
3
Enter a number.
4
Enter a number.
5
Enter a number.
5
Enter a number.
5
Enter a number.
1
Enter a number.
1
Enter a number.
3
Length of new array = 4
bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $

```

- Write a Java program to find the sum of the two elements of a given array which is equal to a given integer.

```

import java.util.*;
class q4
{
    public static void main(String[] args) {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter the number whose sum is to found from 2 array
elements.");
        int num = obj.nextInt();

        System.out.println("Enter the number of array elements.");
        int n = obj.nextInt();
        int a[] = new int[n];
        int i, j;

        for(i=0;i<n;i++)
        {
            System.out.println("Enter a number. (Preferably less than
"+num+"");
            a[i] = obj.nextInt();
        }
    }
}

```

```

        for(i=0;i<n;i++)
        {
            for(j=i;j<n;j++)
            {
                if(a[i]+a[j]==num)
                    System.out.println(a[i]+" "+a[j]+" = "+num);
            }
        }
    }
}

```

```

1  import java.util.*;
2  class q4
3  {
4      public static void main(String[] args) {
5          Scanner obj = new Scanner(System.in);
6
7          System.out.println("Enter the number
8          int num = obj.nextInt();
9
10         System.out.println("Enter the number
11         int n = obj.nextInt();
12         int a[] = new int[n];
13         int i, j;
14
15         for(i=0;i<n;i++)
16         {
17             System.out.println("Enter a number
18             a[i] = obj.nextInt();
19         }
20
21         for(i=0;i<n;i++)
22         {
23             for(j=i;j<n;j++)
24             {
25                 if(a[i]+a[j]==num)
26                     System.out.println(a[i]+"
27             }
28         }
29     }
30 }

```

Terminal Output:

```

bunty@Bunty:/mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $ javac q4.java
bunty@Bunty:/mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $ java q4
Enter the number whose sum is to be found from 2 array elements.
10
Enter the number of array elements.
5
Enter a number. (Preferably less than 10)
3
Enter a number. (Preferably less than 10)
7
Enter a number. (Preferably less than 10)
5
Enter a number. (Preferably less than 10)
6
Enter a number. (Preferably less than 10)
4
3 + 7 = 10
5 + 5 = 10
6 + 4 = 10
bunty@Bunty:/mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 2 $

```

### Experiment – 3

1. A hash algorithm uses rotation and fold shift methods to compute the address at which the user input has to be stored. Define a static method to perform rotation of the data by moving the least significant digit to the most significant bit position. Also define a non-static method to perform fold shift by dividing the rotated data into segments of length 2 and then add all the segments to get the hash address. If the sum has more than 2 digits, delete the most significant digit and the resulting number is the address. Invoke these methods from main() method.

Eg., If the data is 112286, after rotation it should be 611228 and after fold shift it should be  $61 + 12 + 28 = 101 = 01$  (after deleting the most significant digit)

```

import java.util.*;
import java.lang.*;
class q1
{
    public static void main(String[] args) {
        Scanner obj = new Scanner(System.in);
        q1 q = new q1();

        System.out.println("Enter the address on which calculation has to be
done.");
        String address = obj.next();

        String returened_string = rotate(address);
        System.out.println(returened_string);

        int get_address = q.segement_add(returened_string);

        if(get_address<10)
            System.out.println("\nAddress required = 0"+get_address);
        else
            System.out.println("\nAddress required = "+get_address);
    }

    static String rotate(String a)
    {
        int len = a.length();
        String sub1 = a.substring(0, len-1);
        String sub2 = a.substring(len-1);
        String new_string = sub2 + sub1;
        return new_string;
    }

    int segement_add(String a)
    {
        int l = a.length();
        int no_of_segments = l/2;
        int segments_array[] = new int[no_of_segments];
        int i, j=0;
        int sum = 0;

        for(i=0; i<l; i=i+2)
        {
            String extracted_substring = a.substring(i, i+2);
            segments_array[j] = Integer.parseInt(extracted_substring);
            System.out.print(segments_array[j]+" ");

```

```

        j++;
    }

    for(i=0;i<no_of_segments;i++)
    {
        sum = sum + segments_array[i];
    }

    return sum%100;
}
}

```

The screenshot shows a Sublime Text editor with a Java file named q1.java. The code implements a program that takes a string and an address as input, rotates the string, and then calculates a sum based on the segments of the rotated string. The code is as follows:

```

1  import java.util.*;
2  import java.lang.*;
3  class q1
4  {
5      public static void main(String[] args) {
6          Scanner obj = new Scanner(System.in);
7          q1 q = new q1();
8
9          System.out.println("Enter the address on which calculation has to be done.");
10         String address = obj.next();
11
12         String returned_string = rotate(address);
13         System.out.println(returned_string);
14
15         int get_address = q.segement_add(returned_string);
16
17         if(get_address<10)
18             System.out.println("\nAddress required = " + get_address);
19         else
20             System.out.println("\nAddress required = " + get_address);
21     }
22
23     static String rotate(String a)
24     {
25         int len = a.length();
26         String sub1 = a.substring(0, len-1);
27         String sub2 = a.substring(len-1);
28         String new_string = sub2 + sub1;
29         return new_string;
30     }
31
32     int segement_add(String a)
33     {
34         int l = a.length();
35         int no_of_segments = l/2;
36         int segments_array[] = new int[no_of_segments];
37         int i, j=0;
38         int sum = 0;
39
40         for(i=0; i<no_of_segments; i++)
41         {
42             segments_array[i] = Integer.parseInt(a.substring(i*2, (i+1)*2));
43         }
44
45         for(i=0; i<no_of_segments; i++)
46         {
47             sum = sum + segments_array[i];
48         }
49
50         return sum%100;
51     }
52 }

```

The terminal window shows the execution of the program. It prompts the user to enter an address, and the user enters "61 12 28". The program outputs the rotated string "894756894" and then the address required, which is 37.

```

bunty@Bunty: /mnt/c/My Computer/Local Disk G/VIT/7th Semester/CSE1007 materials/Lab/Experiment 3
$ javac q1.java
bunty@Bunty: /mnt/c/My Computer/Local Disk G/VIT/7th Semester/CSE1007 materials/Lab/Experiment 3
$ java q1
Enter the address on which calculation has to be done.
61 12 28
Address required = 37

```

- Consider a Java program containing a statement to invoke `format( )` method for displaying the output. Write a program to verify the syntax correctness of the statement by checking for the following.

The number of format specifiers and arguments should match.

Datatype of the arguments should match the format specifiers used.

For example, if the input is similar to any of the three statements given below, the output should be “correct syntax” for the first two statements and it should be “wrong syntax” for the last statement.

```
System.out.format("sum is %d"+" avg is %f ", a,b);
```

```
System.out.format(" name is %s"+"sum is %d avg is %f ", s,a,b);
```

```
System.out.format("sum is %d"+" avg is %f ", b,a);
```

Assume you have a 2D String array storing all the variables used in the program and their datatypes as follows.

a	B	s	x
int	Float	String	int

```
import java.util.*;
class q2
{
    public static void main(String[] args) {
        q2 q = new q2();
        Scanner obj = new Scanner(System.in);
        String a[][] = { {"a", "b", "s", "x"}, {"int", "float", "String", "int"} };

        System.out.println("Enter the statement. ");
        String text = obj.next();

        q.format(text);
    }

    void format(String input)
    {
        int i, j=0, k=0;

        int len = input.length();

        int index_format[] = new int[4];
        int index_comma[] = new int[4];
        char ch = ' ';
        for(i=0;i<len;i++)
        {
```

```

        ch = input.charAt(i);
        if(ch=='%')
        {
            index_format[j] = i + 1;
            j++;
        }

        if(ch==',')
        {
            index_comma[k] = i + 1;
            k++;
        }

    }

    for(i=0;i<4;i++)
    {
        if(((input.charAt(index_format[i])== 'd') &&
(input.charAt(index_comma[i])== 'a'))
            System.out.println("Syntax is correct");
        else if(((input.charAt(index_format[i])== 'f') &&
(input.charAt(index_comma[i])== 'b'))
            System.out.println("Syntax is correct");
        else if(((input.charAt(index_format[i])== 's') &&
(input.charAt(index_comma[i])== 's'))
            System.out.println("Syntax is correct");
        else if(((input.charAt(index_format[i])== 'd') &&
(input.charAt(index_comma[i])== 'x'))
            System.out.println("Syntax is correct");
        else
            System.out.println("Syntax is wrong!");
    }
}
}

```

```
q2.java
24  char cn = ;
25  for(i=0;i<len;i++)
26  {
27      ch = input.charAt(i);
28      if(ch=='%')
29      {
30          index_format[j] = i + 1;
31          j++;
32      }
33
34      if(ch==',')
35      {
36          index_comma[k] = i + 1;
37          k++;
38      }
39  }
40
41  for(i=0;i<4;i++)
42  {
43      if((input.charAt(index_format[i])=='d') &&
44         System.out.println("Syntax is correct");
45      else if((input.charAt(index_format[i])=='f')
46         System.out.println("Syntax is correct");
47      else if((input.charAt(index_format[i])=='s')
48         System.out.println("Syntax is correct");
49      else if((input.charAt(index_format[i])=='d')
50         System.out.println("Syntax is correct");
51      else
52         System.out.println("Syntax is wrong!");
53  }
54  }
55  }
56  }
```

```
bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 3 $ javac q2.java
q2.java:44: error: incompatible types: boolean cannot be converted to int
    if((input.charAt(index_format[i])=='d') && (input.charAt(index_comma[i])=='a'))
    ^
q2.java:46: error: incompatible types: boolean cannot be converted to int
    else if((input.charAt(index_format[i])=='f') && (input.charAt(index_comma[i])=='b'))
    ^
q2.java:48: error: incompatible types: boolean cannot be converted to int
    else if((input.charAt(index_format[i])=='s') && (input.charAt(index_comma[i])=='s'))
    ^
q2.java:50: error: incompatible types: boolean cannot be converted to int
    else if((input.charAt(index_format[i])=='d') && (input.charAt(index_comma[i])=='x'))
    ^
Note: Some messages have been simplified; recompile with -Xdiags:verbose to get full output
4 errors
bunty@Bunty: /mnt/c:/My Computer/Local Disk G:/VIT/7th Semester/CSE1007 materials/Lab/Experiment 3 $
```