JOBSHEET I

BASIC PROGRAMMING

From:

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Class:

1 I

Absence:

01

Major:

Information Technology

Study Program:

Informatic Engineering

1.1 Learning Objective

After finishing this practicum, students will be able to:

1. Understand of conditional statements, loops, array, and function
2. Implementation of using conditional statements, loops, array, and function in code program

1.2 Conditional Statements

The theory of this practicum is already explained in Basic Programming course. Therefore, in this practicum session we will do a quick review of your understanding by answering the following questions.

1.2.1 Practicum of Conditional Statements

Questions

1. Create a program to calculate final score of students with these compositions. 20% of final score comes from assignment score, 35% from midterm score, and 45% from final exam. Each input score ranges from 0 – 100. Once the final score is determined, do the conversion as follows:

Score	Alphabets
80 < N ≤ 100	A
73 < N ≤ 80	B+
65 < N ≤ 73	B
60 < N ≤ 65	C+
50 < N ≤ 60	C
39 < N ≤ 50	D
N ≤ 39	E

If the acquired alphabets are A, B+, B, C+, C then the student is **passed.** Otherwise, the student is **failed.**

The program needs inputs for assignment score, midterm, final exam score
The output will be the final score, its alphabet, and information whether they **passed** or **failed**

Example:

```
Program Menghitung Nilai Akhir
======================
Masukkan Nilai Tugas: 85
Masukkan Nilai UTS: 60
Masukkan Nilai UAS: 82
======================
======================
nilai akhir : 74.9
Nilai Huruf :B+
======================
SELAMAT LULUS
BUILD SUCCESSFUL (total time: 15 seconds)
```

Code :

```java
import java.util.*;

public class question1 {
    public static void main(String[] args) {

    Scanner scanner = new Scanner(System.in);
    double assignment, mid_exam, final_exam, final_score;

    System.out.print("Insert value of assignment : ");
    assignment = scanner.nextDouble();

    System.out.print("Insert value of mid exam : ");
    mid_exam = scanner.nextDouble();

    System.out.print("Insert value of final exam : ");
    final_exam = scanner.nextDouble();

    final_score = (assignment * 0.20) + (mid_exam * 0.35) + (final_exam * 0.45);

    result(final_score);

    }

    static void result(double final_score) {
        if (final_score > 80 && final_score <= 100) {
                    System.out.println("Final score = " + final_score);
                    System.out.println("A");
            System.out.println("Passed");
            } else if (final_score > 73 && final_score <= 80) {
                    System.out.println("Final score = " + final_score);
                    System.out.println("B+");
            System.out.println("Passed");
            } else if (final_score > 65 && final_score <= 73) {
                    System.out.println("Final score = " + final_score);
                    System.out.println("B");
                    System.out.println("Passed");
            } else if (final_score > 60 && final_score <= 65) {
                    System.out.println("Final score = " + final_score);
                    System.out.println("C+");
                    System.out.println("Passed");
            } else if (final_score > 50 && final_score <= 60) {
                    System.out.println("Final score = " + final_score);
                    System.out.println("C");
                    System.out.println("Passed");
            } else if (final_score > 39 && final_score <= 50) {
                    System.out.println("Final score = " + final_score);
                    System.out.println("D");
                    System.out.println("Failed");
            } else {
                    System.out.println("Final score = " + final_score);
                    System.out.println("E");
                    System.out.println("Failed");
            }

    }

}

```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac question1.java && java question1
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Insert value of assignment : 85
Insert value of mid exam : 60
Insert value of final exam : 82
Final score = 74.9
B+
Passed

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```

1.3. Loops

The theory of this practicum is already explained in Basic Programming course. Therefore, in this practicum session we will do a quick review of your understanding by answering the following questions.

1.3.1. Practicum of Loops

Question

1. Create a program that can display the day from Monday to Sunday repetitively with days amount is n, the n will be the last 2 digits from your NIM.

   *if n < 10, then add 10 (n+=10)

   Example:

   Input NIM: 2041720010, then n = 10

   OUTPUT: Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday

   2nd Example:

   Input NIM: 2041720002, then n = 12

   OUTPUT: Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday

   Example result:

```
Masukkan Nim :201234501
======================
n : 11
senin selasa rabu kamis jumat sabtu minggu senin selasa rabu kamis BUILD SUCCESSFUL (total time: 9 seconds)
```

   Code:

```java
import java.util.*;

public class question2 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        int count = 0;
        long nim, twodigit = 0L;
        String [] days = {"Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday"};

        System.out.print("Insert your NIM : ");
        nim = scanner.nextLong();

        twodigit = nim % 100;

        if (twodigit < 10) {
            twodigit += 10;
        }

        for (int i = 0; i < twodigit; i++) {
            System.out.print(days[count % 7] + " ");
            count++;
        }


    }
}

```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac question2.java && java question2
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Insert your NIM : 2241720263
Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Sat
urday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursd
ay Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wed
nesday Thursday Friday Saturday Sunday

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```

1.4. Array

The theory of this practicum is already explained in Basic Programming course. Therefore, in this practicum session we will do a quick review of your understanding by answering the following questions.

1.4.1. Practicum of Array

Question

1. RoyalGarden is a flower shop that has many branches. Every day, the sold flowers and its stock has recorded as follows

	Aglaonema	Taro	Alocasia	Rose
RoyalGarden 1	10	5	15	7
RoyalGarden 2	6	11	9	12
RoyalGarden 3	2	10	10	5

RoyalGarden 4	5	7	12	9

The price for each Aglaonema is 75.000, Taro is 50.000, Alocasia is 60.000, and Rose is 10.000. Please help RoyalGarden to create a program that can calculate:

A. Stock for each flower through all branches

B. If there is an additional information about a stock has decreased since the flowers are wither or dead on RoyalGarden 1 branch. Those dead flowers are 1 Aglaonema, 2 Taros, and 5 Roses. Please calculate the income of RoyalGarden 1 if all flowers are sold out.

Code:

```java
public class question3 {
    public static void main(String[] args) {

        int [][] stock = {
            {10, 15, 15, 7},
            {6, 11, 9, 12},
            {2, 10, 10, 5},
            {5, 7, 12, 9}
        };

        int [] price = {75_000, 50_000, 60_000, 10_000};

        String [] branch = {"Royal Garden 1", "Royal Garden 2", "Royal Garden 3", "Royal Garden 4"};

        String [] flower = {"Aglaonema", "Taro", "Alocasia", "Rose"};

        int [] flowerStock = new int [4];

        for (int i = 0; i < stock.length; i++) {
            System.out.print(branch[i] + " = ");
            for (int j = 0; j < stock[i].length; j++) {
                System.out.print(stock[i][j] + " ");
            }
            System.out.println();
        }

        System.out.println();

        for (int i = 0; i < stock[0].length; i++) {
            int flowerTotal = 0;
            for (int j = 0; j < stock.length; j++) {
                flowerTotal += stock[j][i];
            }
            flowerStock[i] = flowerTotal;
        }

        for (int i = 0; i < flowerStock.length; i++) {
            System.out.print(flower[i] + " = ");
            System.out.println(flowerStock[i]);
        }

        System.out.println();

        stock[0][0] -= 1;
        stock[0][1] -= 2;
        stock[0][3] -= 5;

        int totalIncome = 0;

        for (int i = 0; i < flower.length; i++) {
            totalIncome += stock[i][0] * price[i];
        }

        System.out.printf("Total income Royal Garden 1 = %,d\n", totalIncome);

    }
}

```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac question3.java && java question3
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Royal Garden 1 = 10 15 15 7
Royal Garden 2 = 6 11 9 12
Royal Garden 3 = 2 10 10 5
Royal Garden 4 = 5 7 12 9

Aglaonema = 23
Taro = 43
Alocasia = 46
Rose = 33

Total income Royal Garden 1 = 1,145,000

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```

1.5. Function

The theory of this practicum is already explained in Basic Programming course. Therefore, in this practicum session we will do a quick review of your understanding by answering the following questions.

1.5.1. Practicum of Function

Question

1. Create 2 functions for:
   a. Display Fibonacci row using loop

   Code:

```java
import java.util.*;

public class question4a {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Insert number : ");
        int num = scanner.nextInt();
        printFibonacci(num);
    }

    public static void printFibonacci(int num) {
        int a = 0, b = 1, c;
        System.out.println("Fibonacci sequence up to "  + num + " terms = ");

        for (int i = 0; i < num; i++) {
            if (i <= 1) {
                c = i;
            } else {
                c = a + b;
                a = b;
                b = c;
            }
            System.out.print(c + " ");
        }
    }
}

```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac question4a.java && java question4a
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Insert number : 9
Fibonacci sequence up to 9 terms =
0 1 1 2 3 5 8 13 21

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```

b. Display Fibonacci row using recursive function

Notes:

Fibonacci row: 0, 1, 1, 2, 3, 5, 8, 13, 21

Code:

```java
import java.util.*;

public class question4b {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Insert number : ");
        int num = scanner.nextInt();
        printFibonacci(num);
    }

    public static int fibonacci(int num) {
        if (num == 0 || num == 1) {
            return num;
        } else {
            return fibonacci(num -1) + fibonacci(num -2);
        }
    }

    public static void printFibonacci(int num) {
        System.out.println("Fibonacci sequence up to "  + num + " terms = ");
        for (int i = 0; i < num; i++) {
            System.out.print(fibonacci(i) + " ");
        }
    }
}

```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac question4b.java && java question4b
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Insert number : 9
Fibonacci sequence up to 9 terms =
0 1 1 2 3 5 8 13 21

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```

1.5.2. Assignment

1. Smile Laundry is a laundry service that costs its customer as follows:
   - Cost for each 1kg clothes is Rp 4.500
   - If the customer does laundry more than 10kg clothes, they will get 5% discount

   Today, the laundry has 4 customers, those are Ani, Budi, Bina, and Cita. Ani brought 4kg clothes, Budi brought 15kg clothes, Bina brought 6kg,

and Cita brought 11kg. Create a program to calculate the income of Smile Laundry at that day.

Code:

```java
public class ass1 {
    public static void main(String[] args) {
        double costPerKg = 4_500;
        double [] amountClothes = {4, 15, 6, 11};
        String [] customers = {"Ani", "Budi", "Bina", "Cita"};
        double totalIncome = 0;
        double discount = 0.05;

        for (int i = 0; i < amountClothes.length; i++) {
            double clothes = amountClothes[i];
            double cost = clothes * costPerKg;
            if (clothes > 10) {
                cost *= discount;
            }
            System.out.printf("%s's cost = %,.2f\n", customers[i], cost);
            totalIncome += cost;
        }
        System.out.printf("Total = %,.2f\n", totalIncome);
    }
}
```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac ass1.java && java ass1
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Ani's cost = 18,000.00
Budi's cost = 3,375.00
Bina's cost = 27,000.00
Cita's cost = 2,475.00
Total = 50,850.00

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```

2. Somebody saves 1 million rupiahs in a bank. With its interest is 2% for each month, then in what month does the customer balance reach 1.5 million? Create a program for this case study.

Code:

```java
public class ass2 {
    public static void main(String[] args) {
        double money = 1_000_000;
        double interestRate = 0.02;
        int months = 0;

        while (money < 1_500_000) {
            money *= (1 + interestRate);
            months++;
        }
        System.out.printf("The money reaches 1.5 million in %d months\n", months);
    }
}
```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac ass2.java && java ass2
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
The money reaches 1.5 million in 21 months

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```

3. Create a program that can display even numbers from 2 until nth row, unless the even number is a multiple of 4.

   Example:

   Input of n: 5

   output: 2, 6, 10, 14, 18

   Code:

```java
import java.util.*;

public class ass3 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Insert number : ");
        int n = scanner.nextInt();
        int num = 2;

        for (int i = 0; i < n; i++) {
            System.out.print(num + " ");
            num += 4;
        }

    }
}

```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac ass3.java && java ass3
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Insert number : 5
2 6 10 14 18

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```

4. Create a program that includes a function to:
   a. Menu (to choose a calculation for area of triangle / rectangle / circle)

Code:

```java
public static void menu(int choices) {
    switch (choices) {
        case 1:
            double base, height;
            System.out.print("Insert base : ");
            base = scanner.nextDouble();
            System.out.print("Insert height : ");
            height = scanner.nextDouble();
            double areaTriangle = triangle(base, height);
            System.out.println("Area of triangle = " + areaTriangle);
            break;
        case 2:
            int length, width;
            System.out.print("Insert length : ");
            length = scanner.nextInt();
            System.out.print("Insert width : ");
            width = scanner.nextInt();
            int areaRectangle = rectangle(length, width);
            System.out.println("Area of rectangle = " + areaRectangle);
            break;
        case 3:
            double r;
            System.out.print("Insert radius : ");
            r = scanner.nextDouble();
            circle(r);
            double areaCircle = circle(r);
            System.out.println("Area of circle = " + areaCircle);
            break;
        default:
            System.out.println("Invalid number!!!");
            break;
    }
}
```

b. Calculate area of triangle

Code:

```java
public static double triangle(double base, double height) {
    double area = 0.5 * base * height;
    return area;
}
```

c. Calculate area of rectangle

Code:

```java
public static int rectangle(int length, int width) {
    int area = length * width;
    return area;
}
```

d. Calculate area of circle

code:

```java
public static double circle(double r) {
    double area = 3.14 * r * r;
    return area;
}
```

Result:

```
┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$ javac ass4.java && java ass4
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
Menu
1. Triangle
2. Rectangle
3. Circle

Choose number : 2
Insert length : 7
Insert width : 5
Area of rectangle = 35

┌──(zharsuke㉿asus-vivobook)-[~/…/Semester_2/Data_Structure_and_Algorithm_Practicum/Meet_1/coding]
└─$
```