

## **Basic Programming Practicum Job Sheet 6 Meeting 7**



**From:**  
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**Class:**  
11

**Absence:**  
01

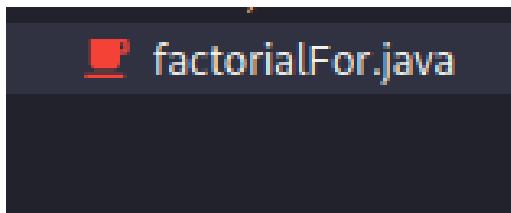
**Major:**  
Information Technology

**Study Program:**  
Informatic Engineering

## **Experiment 1: Calculate factorial values using iteration**

### **a) Loop using for**

1. Open a text editor. Create a new file, name it factorialFor.java



2. Write the basic structure of the Java programming language which contains the main() function

```
1 public class factorialFor {  
2     Run | Debug  
3     public static void main(String[] args) {  
4         //  
5     }  
6 }  
7  
8
```

3. Add the Scanner library.

```
import java.util.Scanner;  
  
public class factorialFor {
```

4. Make a Scanner declaration with the name input

```
Scanner input = new Scanner(System.in);
```

5. Create multiple int type variables with names number, factorial, and i

```
int number, factorial, i;
```

6. Write down the syntax for entering the value from keyboard

```
System.out.print("Enter a number : ");  
number = input.nextInt();
```

7. Create a for loop structure to calculate the factorial

```

factorial = 1;
for (i = 1; i <= number; i++) {
    factorial = factorial * i;
}

```

8. Display factorial calculation results

```
System.out.printf("The factorial of %d is %d\n", number, factorial);
```

9. Compile and run the program. Observe the results!

code :

```

1 import java.util.Scanner;
2
3 public class factorialFor {
4     Run | Debug
5     public static void main(String[] args) {
6
7         Scanner input = new Scanner(System.in);
8
9         int number, factorial, i;
10
11         System.out.print("Enter a number : ");
12         number = input.nextInt();
13
14         factorial = 1;
15         for (i = 1; i <= number; i++) {
16             factorial = factorial * i;
17         }
18         System.out.printf("The factorial of %d is %d\n", number, factorial);
19     }
20 }

```

result :

```

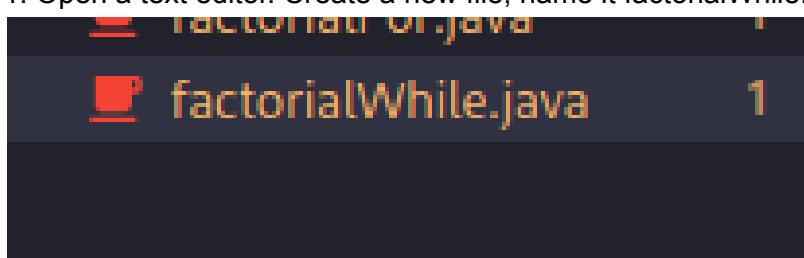
└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
└─$ javac factorialFor.java && java factorialFor.java
Enter a number : 5
The factorial of 5 is 120
└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
└─$ 

```

1. Open a text editor. Create a new file, name it factorialWhile.java  
 2. Write the basic structure of the Java programming language which contains the main() function  
 3. Add the Scanner library.  
 4. Make a Scanner declaration with the name input  
 5. Write down the syntax for entering the value from keyboard  
 6. Write down the syntax for entering the value from keyboard

**b) Loop using while**

1. Open a text editor. Create a new file, name it factorialWhile.java



2. Write the basic structure of the Java programming language which contains the main() function

```

public class factorialWhile {
    Run | Debug
    public static void main(String[] args) {
    }
}

```

3. Add the Scanner library.

```
import java.util.Scanner;
```

```
public class factorialFor {
```

4. Make a Scanner declaration with the name input

```
Scanner input = new Scanner(System.in);
```

5. Create multiple int type variables with names number, factorial, and i

```
int number, factorial, i;
```

6. Write down the syntax for entering the value from keyboard

```
System.out.print("Enter a number : ");
number = input.nextInt();
```

7. Create a while loop structure to calculate the factorial

```
factorial = 1;
i = 1;

while (i <= number) {
    factorial = factorial * i;
    i++;
}

System.out.printf("The factorial of %d is %d\n", number, factorial);
```

8. Display factorial calculation results

```
System.out.printf("The factorial of %d is %d\n", number, factorial);
```

9. Compile and run the program. Observe the results!

code :

```
import java.util.Scanner;

public class factorialWhile {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        int number, factorial, i;

        System.out.print("Enter a number : ");
        number = input.nextInt();

        factorial = 1;
        i = 1;

        while (i <= number) {
            factorial = factorial * i;
            i++;
        }

        System.out.printf("The factorial of %d is %d\n", number, factorial);
    }
}
```

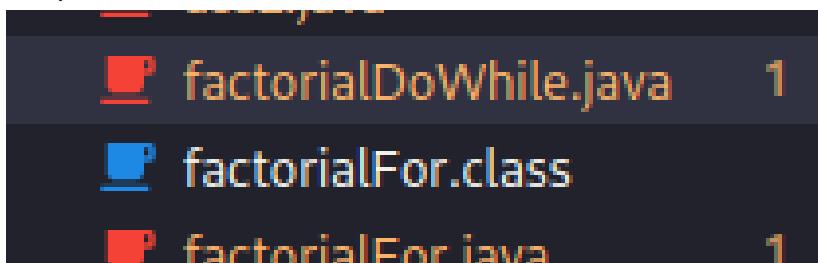
result :

```
(zharsuke@LAPTOP-FCSRQQ00) [~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac factorialWhile.java && java factorialWhile.java
Enter a number ; 5
The factorial of 5 is 120
6. Write down the syntax for entering the value from keyboard
7. Create a do-while loop structure to calculate the factorial
8. Display factorial calculation results
9. Compile and run the program. Observe the result.

(zharsuke@LAPTOP-FCSRQQ00) [~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$
```

### c) Loop using do-while

1. Open a text editor. Create a new file, name it factorialDoWhile.java



2. Write the basic structure of the Java programming language which contains the main() function

```
public class factorialDoWhile {
    Run|Debug
    public static void main(String[] args) {
    }
}
```

3. Add the Scanner library.

```
import java.util.Scanner;
```

4. Make a Scanner declaration with the name input

```
Scanner input = new Scanner(System.in);
```

5. Create multiple int type variables with names number, factorial, and i

```
int number, factorial, i;
```

6. Write down the syntax for entering the value from keyboard

```
System.out.print("Enter a number : ");
number = input.nextInt();
```

7. Create a do-while loop structure to calculate the factorial

```

factorial = 1;
i = 1;

do {
    factorial = factorial * i;
    i++;
} while (i <= number);

```

#### 8. Display factorial calculation results

```
System.out.printf("The factorial of %d is %d\n", number, factorial);
```

#### 9. Compile and run the program. Observe the results!

code :

```

import java.util.Scanner;
Run|Debug
public class factorialDoWhile {
public static void main(String[] args) {
    Scanner input = new Scanner(System.in);
    int number, factorial, i;
    System.out.print("Enter a number : ");
    number = input.nextInt();
    factorial = 1;
    i = 1;
    do {
        factorial = factorial * i;
        i++;
    } while (i <= number);
    System.out.printf("The factorial of %d is %d\n", number, factorial);
}

```

result :

```

(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac factorialDoWhile.java && java factorialDoWhile.java
Enter a number ; 5
The factorial of 5 is 120
OUTLINE
(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ █

```

#### 10. Match the results of the running programs that you have created according to the following display

```

Enter a number: 6
The factorial of 6 is 720

```

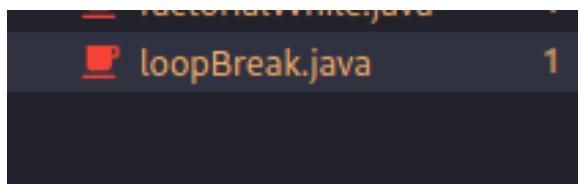
```

(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac factorialDoWhile.java && java factorialDoWhile.java
Enter a number ; 6
The factorial of 6 is 720
3. Add the Scanner library.
4. Make a Scanner declaration with the name input
5. Create multiple int type variables with names number an
(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ █

```

### Experiment 2: Exit loop using break

1. Open a text editor. Create a new file, name it loopBreak.java



2. Write the basic structure of the Java programming language which contains the main() function

```
3 public class loopBreak {  
    Run | Debug  
4     public static void main(String[] args) {  
5     }  
6 }  
7  
8 }
```

3. Add the Scanner library.

```
import java.util.Scanner;
```

4. Make a Scanner declaration with the name input

```
Scanner input = new Scanner(System.in);
```

5. Create multiple int type variables with names number and b

```
int number, b;
```

6. Add the following code to enter the value from keyboard in 'for' loop structure. In 'for' loop there is also a condition to stop the process using the break statement

```
for (b = 0; true;) {  
    System.out.print("Enter a number : ");  
    number = input.nextInt();  
    b += number;  
    if (b > 50) {  
        break;  
    }  
}  
System.out.printf("The numbers stop at the sum of the numbers %d\n", b);  
}
```

7. Compile and run the program. Observe the results!

code :

```

1 import java.util.Scanner;
2
3 public class loopBreak {
4     Run | Debug
5     public static void main(String[] args) {
6
7         Scanner input = new Scanner(System.in);
8
9         int number, b;
10
11        for (b = 0; true;) {
12
13            System.out.print("Enter a number : ");
14            number = input.nextInt();
15            b += number;
16            if (b > 50) {
17                break;
18            }
19        }
20        System.out.printf("The numbers stop at the sum of the numbers %d\n", b);
21    }
22 }

```

result :

```

└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac loopBreak.java && java loopBreak.java
Enter a number : 10                         8. Match the results of the running programs that you have created according
Enter a number : 20                         following display
Enter a number : 30
The numbers stop at the sum of the numbers 60
Experiment 3: Exit loop using continue
└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ 

```

8. Match the results of the running programs that you have created according to the following display

```

Enter a number: 15
Enter a number: 9
Enter a number: 12
Enter a number: 24
The numbers stop at the sum of the numbers 60

```

```

└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac loopBreak.java && java loopBreak.java
3. Add the Scanner library
4. Create a file named loopBreak.java with the following code
Enter a number : 15
Enter a number : 9
Enter a number : 12
Enter a number : 24
The numbers stop at the sum of the numbers 60
Experiment 3: Exit loop using continue
└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ 

```

### Experiment 3: Exit loop using continue

1. Open a text editor. Create a new file, name it loopContinue.java

2. Write the basic structure of the Java programming language which contains the main() function

```
public class loopContinue {  
    Run|Debug  
    public static void main(String[] args) {  
  
    }  
}
```

3. Add the Scanner library.

```
import java.util.Scanner;
```

4. Make a Scanner declaration with the name input

```
Scanner input = new Scanner(System.in);
```

5. Create multiple int type variables with names number, b, i, and count. Then also create two double type variables with names avg and total

```
int number, b, i, count;  
double avg, total;
```

6. Add the following code to enter the value from keyboard in ‘for’ loop structure. In ‘for’ loop there is also a condition to stop the process using the continue statement

```
b = 0;  
count = 0;  
for ( i = 0; i < 5; i++) {  
  
    System.out.print("Enter a number : ");  
    number = input.nextInt();  
    if (number >= 50) {  
        continue;  
    }  
    b += number;  
    count++;  
}  
total = (double) b;  
System.out.printf("The total number is less than 50 : %.2f\n", total);  
avg = (double) b / count;  
System.out.printf("Average number less than 50 : %.2f\n", avg);
```

7. Compile and run the program. Observe the results!

code :

```

1 import java.util.*;
2
3 public class loopContinue {
4     Run|Debug
4     public static void main(String[] args) {
5
6         Scanner input = new Scanner(System.in);
7
8         int number, b, i, count;
9         double avg, total;
10
11         b = 0;
12         count = 0;
13         for ( i = 0; i < 5; i++) {
14
15             System.out.print("Enter a number : ");
16             number = input.nextInt();
17             if (number >= 50) {
18                 continue;
19             }
20             b += number;
21             count++;
22         }
23         total = (double) b;
24         System.out.printf("The total number is less than 50 : %.2f\n", total);
25         avg = (double) b / count;
26         System.out.printf("Average number less than 50 : %.2f\n", avg);
27     }
28 }
29
30

```

result :

```

└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding] 0
└─$ javac loopContinue.java && java loopContinue.java
Enter a number : 10
The total number is less than 50 : 50.00
Average number less than 50 : 10.00
└─$ █

```

### 3. Questions!

1. Explain the difference between Experiment 2 and Experiment 3!

8. Match the results of the running programs that you have created according to the following display

```

Enter a number: 25
Enter a number: 35
Enter a number: 45
Enter a number: 55
Enter a number: 30
The total number is less than 50: 135.00
Average number less than 50: 33.75

└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding] 0
└─$ javac loopContinue.java && java loopContinue.java
Enter a number : 25
Enter a number : 35
Enter a number : 45
Enter a number : 55
Enter a number : 30
The total number is less than 50 : 135.00
Average number less than 50 : 33.75
└─$ █

```

### 3. Questions!

1. Explain the difference between Experiment 2 and Experiment 3!
2. Suppose you are asked to create a Java program that asks for input of an integer n. Then, the program displays the character '\*' on the screen times. Which of the two pieces of the program below is better and safer? Why?

<pre>/* for example: user input n has been stored in integer variable n */ int i = 0;  while (i &lt; n) {     System.out.print("*");     i++; }</pre>	<pre>/* for example: user input n has been stored in integer variable n */ int i = 0;  while (i != n) {     System.out.print("*");     i++; }</pre>
---	---

3. What is the output of the following three code snippets?

<pre>int r = 1; int i = 1; int a = 2; int n = 4;  while (i &lt;= n) {     r = r * a;     i++; } System.out.print(r);</pre>	<pre>int n = 5; boolean stop = false;  int i = 1; while (!stop) {     if (i &gt;= n) {         stop = true;     } else {         if (i % 2 == 1) {             System.out.print("#");         } else {             System.out.print("*");         }         i++;     } }</pre>	<pre>int n = 5; long result = 1; for (int i = 1; i &lt;= n; i++){     hasil = hasil *i; }  System.out.println(n+"!=" "+result);</pre>
--	--	---

## Answer

1. The difference between experiment 2 and 3 is that in experiment 2 the user inputs the number until the number is more than 50 no matter how many times the input and when the input number is more than 50 then the program will automatically stop. meanwhile in experiment 3 the user inputs the number for 5 times. when there is an input number more than equal 50 then the input number will be skipped when calculated.
2. I think it is safer to use  $i < n$  than to use  $i \neq n$ , because if  $i < n$  it is certain that  $i$  is less than  $n$ . And  $i \neq n$ , when  $i == n$  the program will indeed stop. but if  $i$  is more than  $n$  then the logic is back to  $i \neq n$ .
3. result
  - a

code :

```
1 public class quest3a {
2     Run|Debug
3     public static void main(String[] args) {
4         int r = 1;
5         int i = 1;
6         int a = 2;
7         int n = 4;
8         while (i <= n) {
9             r = r * a;
10            i++;
11        }
12        System.out.print(r);
13    }
14}
15}
16
```

result :

```
xxxxxx
[zharsuke@LAPTOP-FCSRQQ00] -[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac quest3a.java && java quest3a.java
16
[zharsuke@LAPTOP-FCSRQQ00] -[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ █
```

the output is 16

- b

code :

```
1 public class quest3b {
2     Run|Debug
3     public static void main(String[] args) {
4         int n = 5;
5         boolean stop = false;
6         int i = 1;
7         while (!stop) {
8             if (i >= n) {
9                 stop = true;
10            } else {
11                if (i % 2 == 1) {
12                    System.out.print("#");
13                } else {
14                    System.out.print("*");
15                }
16                i++;
17            }
18        }
19    }
20}
21
```

result :

```
[zharsuke@LAPTOP-FCSRQQ00] -[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac quest3b.java && java quest3b.java
quest3b.java:12: error: illegal character: '\u201c'
        System.out.print("#");
                           ^
quest3b.java:12: error: illegal character: '#'
        System.out.print("#");
                           ^
quest3b.java:12: error: illegal character: '\u201d'
        System.out.print("#");
                           ^
quest3b.java:14: error: illegal character: '\u201c'
        System.out.print("*");
                           ^
quest3b.java:14: error: illegal character: '\u201d'
        System.out.print("*");
                           ^
5 errors
[zharsuke@LAPTOP-FCSRQQ00] -[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ █
```

the output error because there are different or illegal characters with string strings usually in sout.

- C  
code :

```
1 public class quest3c {
2     Run|Debug
3     public static void main(String[] args) {
4
5         int n = 5;
6         long result = 1;
7         for (int i = 1; i <= n; i++){
8             hasil = hasil *i;
9         }
10        System.out.println(n+"!="+result);
11    }
12 }
13 |
```

result :

```
└─[zharesuke@LAPTOP-FCSRQQ00]─[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac quest3c.java && java quest3c.java
quest3c.java:7: error: cannot find symbol
        hasil = hasil *i;
               ^
symbol:  variable hasil
location: class quest3c
quest3c.java:7: error: cannot find symbol
        hasil = hasil *i;
               ^
symbol:  variable hasil
location: class quest3c
2 errors

└─[zharesuke@LAPTOP-FCSRQQ00]─[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ █
```

the output error because there is an incorrect variable naming. the wrong variable is the hasil that should be result.

#### 4. Assignment

1. Create a program to display numbers from 1 to the user input numbers sequentially and skip the multiples of 5 as shown below!

```
Enter a number: 12
1
2
3
4
5
6
7
8
9
10
11
12
Enter a number: 9
1
2
3
4
5
6
7
8
9
```

2. Create a program using the Java programming language that requests input of an integer N ( $N > 0$ ) from user. The program then displays the sum of the first N positive even numbers (even numbers  $\geq 0$ ).

Example:

If the user enters N = 10, the program will count the number of positive numbers in the range 1-10 then display the sum of the positive numbers between 1-10, namely:  $0 + 2 + 4 + 6 + 10 = 30$ .

After that the program will display the average of the positive numbers that were added earlier.

Example of program output

```
Enter a number range: 10
The number of even numbers from 1 to 10 is 5
Even number 1 is 2
Even number 2 is 4
Even number 3 is 6
Even number 4 is 8
Even number 5 is 10
The sum of the even numbers from 1 to 10 is 30
The average of the even numbers from 1 to 10 is 6.00
```

## Result

1. code :

```
assi.java > ...
1 import java.util.*;
2
3 public class ass1 {
4     Run|Debug
5     public static void main(String[] args) {
6
7         Scanner scanner = new Scanner(System.in);
8         int num;
9
10        System.out.print("Enter a number : ");
11        num = scanner.nextInt();
12
13        for (int i = 1; i <= num; i++) {
14
15            if (i == 5) {
16                continue;
17            }
18
19            System.out.println(i);
20        }
21    }
22 }
```

result :

```
└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac ass1.java && java ass1.java
Enter a number : 10
1
2
3
4
5
6
7
8
9
10
└── OUTLINE
└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$
```

2. code :

```
1 import java.util.*;
2
3 public class ass2 {
4     Run|Debug
5     public static void main(String[] args) {
6
7         Scanner scanner = new Scanner(System.in);
8         int num, res = 0, count = 0, divide = 0;
9         double avg = 0;
10
11         System.out.print("Enter a number range : ");
12         num = scanner.nextInt();
13
14         divide = num / 2;
15
16         System.out.println("The number of even numbers from 1 to " + num + " is " + divide);
17
18         for (int i = 1; i <= num; i++) {
19             if (i % 2 == 0) {
20                 count++;
21
22                 res += i;
23                 avg = res / count;
24                 System.out.println("Even number " + count + " is " + i);
25             }
26         }
27
28         System.out.println("The sum of the even numbers from 1 to " + num + " is " + res);
29         System.out.println("The average of the even number from 1 to " + num + " is " + avg);
30
31     }
32 }
33
```

result :

```
└─(zharsuke@LAPTOP-FCSRQQ00)─[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ javac ass2.java && java ass2.java
Enter a number range : 10
The number of even numbers from 1 to 10 is 5
Even number 1 is 2
Even number 2 is 4
Even number 3 is 6
Even number 4 is 8
Even number 5 is 10
The sum of the even numbers from 1 to 10 is 30
The average of the even number from 1 to 10 is 6.0

└─(zharsuke@LAPTOP-FCSRQQ00)─[~/Documents/College/Basic Programming Practicum/Meet 7/coding]
$ █
```