PROGRAMMING LOGBOOK

ELEMENT 1

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LOGBOOK

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LOGBOOK

INTRODUCTION

In this Logbook I have written all the exercises from week2 to week6 to show better understanding of my programming knowledge which is a part of the “Computer Games Technology” course. This assignment really helped me to acquire better understanding of programming. There’s several explanations about why my code works and how it works.

LOGBOOK

Week 2

Short summary about the lecture:

This week we talked about java as a coding language and what are it's uses.

Task 1

Q1

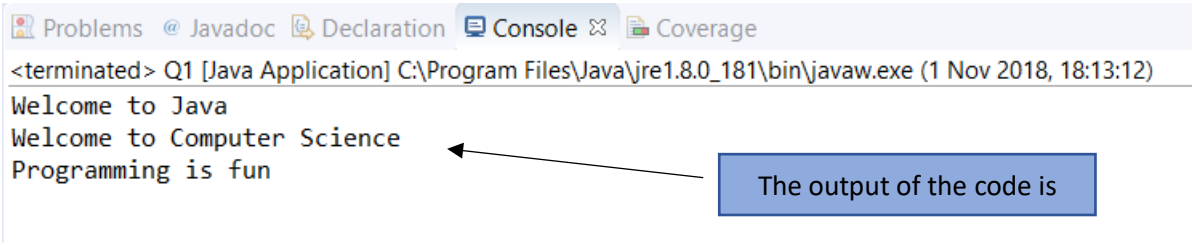
Write a program that displays the following three messages on separate lines: **Welcome to Java**, **Welcome to Computer Science**, and **Programming is fun**

Implementation

```
1  package Week2;
2
3              public class Q1 {
4              public static void main(String[] args) {
5              System.out.println("Welcome to Java");
6              System.out.println("Welcome to Computer Science");
7              System.out.println("Programming is fun");
8  }
9
10 }
11
```

Right here I used three separate lines of print, in order to print out the words in three different lines.
(Lines 5,6,7)

Output



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Task 2

Q2

Write a program that will print the sum of the first 5 odd numbers.

Implementation

```
1  package Week2;
2
3      public class Q2 {
4
5          public static void main(String[] args) {
6
7              int limit = 10;
8
9              System.out.println("List of odd numbers: ");
10
11             for (int i = 1; i < limit;  i++) {
12
13                     if ( i % 2 !=0) {
14
15                         System.out.println(i + " ");
16
17                     }
18
19 }
20 }
21 }
```

Right here, I have a variable to set the limit on how many odd numbers it can print.

Right here, It's given the command to print.

Here I'm using a "for loop" to check if the int "i" is less or equal the limit and if it is add one to "i". If "i"'s remainder isn't equal to 0, then we print it out.

Output

```
List of odd numbers:
1
3
5
7
9
```

The output of the code is

LOGBOOK

Task 3

Q3

Write a program that displays the area and perimeter of a rectangle with the width of **4.5** and height of **7.9** using the following formula:

area = width * height

Implementation

```
1  package Week2;
2
3      public class Q4 {
4      public static void main(String[] args) {
5
6      double width = 4.5;
7
8
9      double height = 7.9;
10
11
12     double area =  width*height;
13
14
15         System.out.println("The area of the rectangle is: " + area);
16     }
17     }
```

The width value is 4.5 (Line 6)

The height value is 7.9 (Line 9)

This code means that in order for the area to be calculated, It has to multiply the width and the height

We print out “The area of the rectangle is:” and the result. (Line 15)

Output

```
Problems  Javadoc  Declaration  Console  Coverage
<terminated> Q4 [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (1 Nov 2018, 19:46:12)
The area of the rectangle is: 35.550000000000004
```

The output of the code is

Task 4

Q4

Write a program to display volume of the cuboid with the width of 4.5, length of 5.2 and height of 8.4.

Implementation

```
1  package Week2;
2
3      public class Q5 {
4      public static void main(String[] args) {
5
6
7          double width = 4.5;
8
9          double length = 5.2;
10
11         double height = 8.4;
12
13         double volume = width * length * height;
14
15
16         System.out.println("The volume is: " +volume);
17
18
19 }
20     }
```

Here are the variables for width, length and height. (lines 7,8,11)

The width value is 4.5

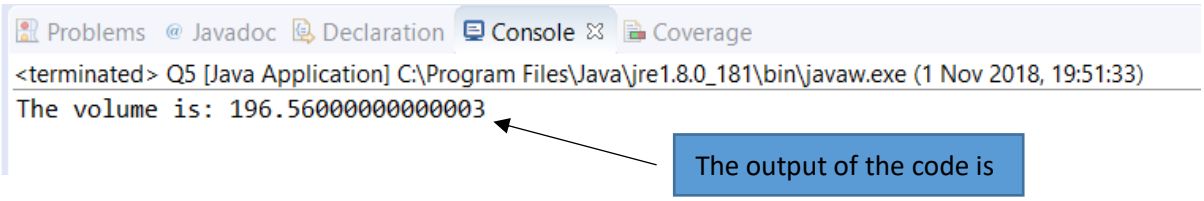
The length value is 5.2

The height value is 8.4

We're telling the computer to calculate the volume of the rectangle, when it multiplies the height, width and length. (Line 13)

We're printing out the result. (line 16)

Output



The output of the code is

Task 5

Q7

Write a program that prints the balance of an account after the first, second and third year. The account has an initial balance of £1,000 and earns 5 per cent interest per year.

Implementation

```
1  package Week2;
2
3  public class Q7 {
4
5      public static void main(String[] args) {
6
7          double FirstYear = 1000*1.05;
8
9          double SecondYear = FirstYear*1.05;
10
11         double ThirdYear = SecondYear*1.05;
12
13
14             System.out.println("Balance after the first year is: " + "£"+ FirstYear );
15
16
17             System.out.println("Balance after the second year is: "+ "£" +SecondYear );
18
19
20             System.out.println("Balance after third year is: "+ "£"+ ThirdYear);
21
22
23     }
24
25 }
26
```

This is the variables for each year. The balance Is calculated when you add the money from the current year and add it's percent (in our case is 5%) , so we just multiply the balance (£1000) with our interest (1.05)

This is the way to print out the balance for the first year plus the interest rate.

In order to calculate the balance for the second and third year, you have to multiply the interest to the current balance. If you are calculating the result for the second year, you have to multiply the interest with the first year, if you want the balance of the third year you have to multiply it with the second year's balance and so on…

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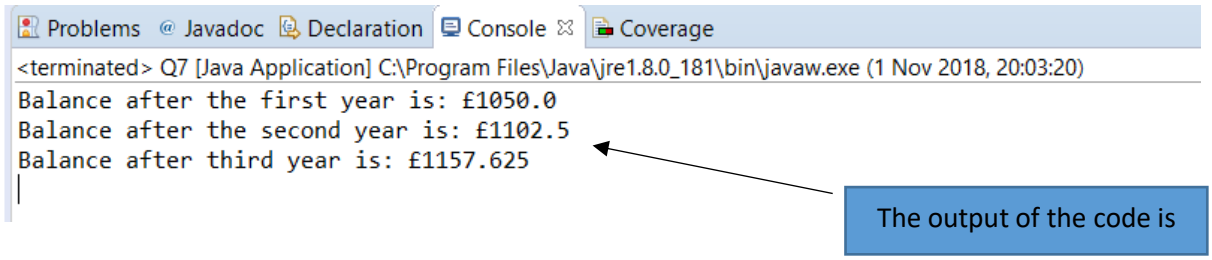
Output



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Week 3

Short summary about the lecture:

*This lecture we talked about the Anatomy of Java, its Elementary and how to use Variables to store Data. We also learned how to use Operators like +, -, *, / and %.*

Task 1

Q1

Write a program to declare two integers and demonstrate the use of +, -, *, / and %.

Implementation

```
1  package Week3;
2
3  public class Q1 {
4
5      public static void main(String[] args) {
6
7
8          int a = 22;
9
10
11         int b = 10;
12
13         System.out.println(a+b +" is the sum of " +a +"+" +b);
14
15
16         System.out.println(a*b +" is the multiplication of "+a+ "*"+b);
17
18
19         System.out.println(a-b +" is the subtraction of "+a+ "-"+b);
20
21
22         System.out.println(a/b+" is the division of "+a +"/" +b);
23
24
25         System.out.println(a%b + " is the remainder of "+a + "/" +b);
26
27         }
28
29     }
30
31
```

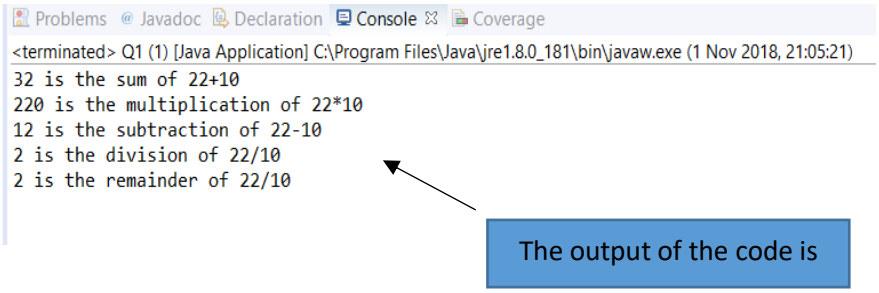
We use the variables “a” and “b” to store our numbers “22 and 10”. (Lines 8,11)

Right here I use the variables “a” and “b” to print out the different types of sum for each task in the different lines.

(13th line – addition)
(16th line – multiplication)
(19th line – subtraction)
(22th line – division)
(25th line – remainder)

We use a and b as variables instead of using numbers so that if we have to change the numbers, we don’t have to go through each print one by one, we have to just change the values of the variables “a” and “b”.

Output



Task 2

Q2

Repeat the calculations from Q1 using two decimal numbers.

Implementation

We use the variables “a” and “b” to store our numbers “20.5 and 10.5”. We use the command double in order to store decimals, whereas “int” stores only integers

```
1  package Week3;
2
3  public class Q2 {
4
5      public static void main(String[] args) {
6          double a = 20.5;
7          double b = 10.5;
8
9              System.out.println(a+b +" is the sum of " +a +"+" +b);
10
11
12             System.out.println(a*b +" is the multiplication of "+a+ "*"+b);
13
14
15             System.out.println(a-b +" is the subtraction of "+a+ "-"+b);
16
17
18             System.out.println(a/b+" is the division of "+a +"/" +b);
19
20
21             System.out.println(a%b + " is the remainder of "+a + "/" +b);
22
23     }
24
25 }
26
```

Right here, we used the same print commands like the last task, although we changed the values of “a” and “b” with decimals instead of integers. (Lines 9,12,15,18,21)

Output

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```
<terminated> Q2 (2) [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (2 Nov 2018, 13:01:37)
31.0 is the sum of 20.5+10.5
215.25 is the multiplication of 20.5*10.5
10.0 is the subtraction of 20.5-10.5
1.9523809523809523 is the division of 20.5/10.5
10.0 is the remainder of 20.5/10.5
```

The output of the code is

Task 3

Q3

Write a program to print out the sum of the first 10 positive prime numbers.

Implementation

```
1  package Week3;
2
3  public class Q3 {
4
5      public static void main(String[] args) {
6
7              int i = 0,j;
8
9              int number = 10;
10
11             int sum = 0;
12
13         System.out.println("The first " +number+ " prime numbers are: ");
14
15                 for (int a = 1; i < number; a++) {
16
17                     for (j = 2; a % j != 0; j++);
18
19                         if(a == j) {
20                             sum += j;
21
22                                     System.out.print (j+ "  " );
23
24                                     i++;
25                         }
26                 }
27         System.out.println("\nThis is the sum of the prime numbers: " +sum );
28     }
29
30 }
31
```

Three different variables are used here "i", "number" and "sum".

(Lines 7,9,11)

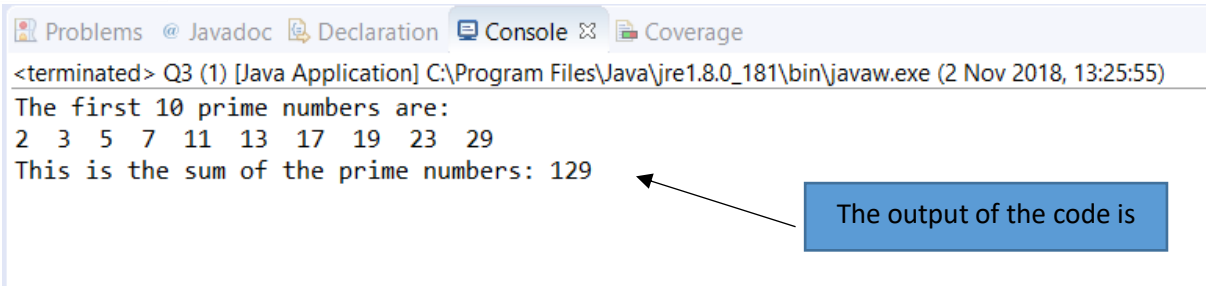
"number" determines how many prime numbers the program is going to print.

The variable "i" is used to store two values – 0 and j (used in the for loop).

Sum is the end result of the 10 prime numbers

Here I have used a for loop and then inside the for loop I added another for loop. The first for loop is used to take a number and check if "i" is less than the limit. Then the second for loop gives "j" to store the number two, then checks if the first for loops int is dividable by "j" and if it's not equal to zero add one to "j". Then there's an if statement that checks if "a" and "j" are equal and if so print out the prime number which is stored in "j" and then it adds one to "i". The limit is there to set how many prime numbers the user wants and this code actually calculates it so it requires a bit of time to calculate the result.

Output



Task 4

Q4

Write a program to work out the circumference and area of a circle of radius 5cm. Take the value of PI as 3.14 and declare it as a constant in your code. area = PI x radius x radius circumference = 2 x PI x radius

Implementation

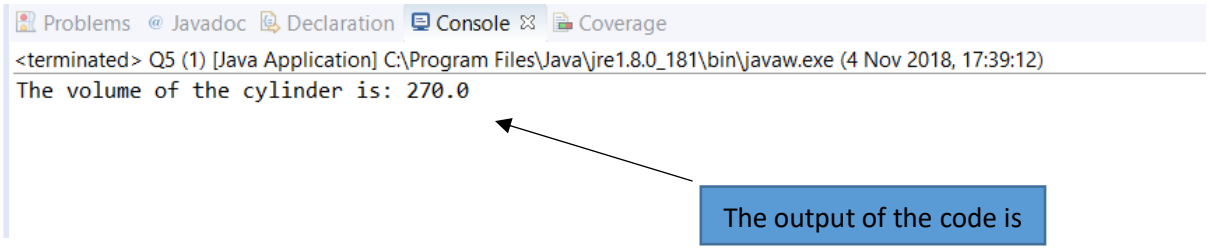
We create a constant of pi with the code “final double” (Line 6)

We give the value of radius to be 3 and the height to be 10. As we have pi, the radius and the height of the cylinder, we can figure out the volume with a formula (pi*radius*radius*height) (Lines 8, 10,12)

We print out “The volume of the cylinder is” and the result.

```
1  package Week3;
2
3  public class Q5 {
4
5      public static void main(String[] args) {
6      final double pi = 3;
7
8          int radius = 3;
9
10         int height = 10;
11
12         double v = (pi*radius*radius*height);
13
14             System.out.println("The volume of the cylinder is: "+ v);
15
16
17
18
19     }
20
21 }
22
```

Output



Task 5

Q5

Write a program to display volume V of cylinder, illustrated below, if radius is 3cm and height is 10cm. Take the value of PI (shown as symbol π below) as 3 and declare it as a constant in your code. The formula for the volume is:

$V = \pi r^2 h$

Implementation

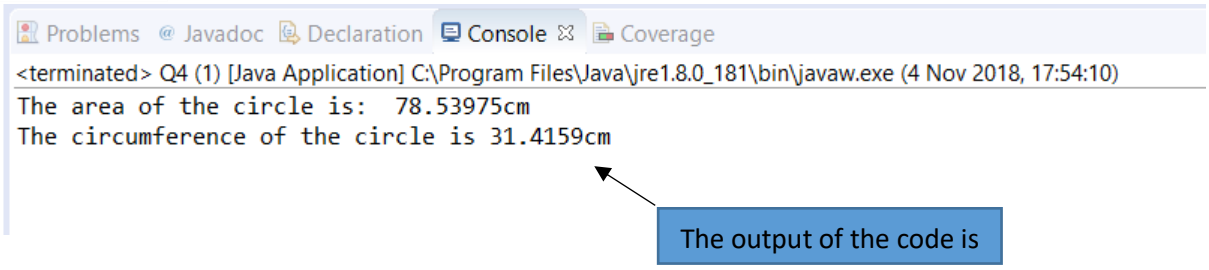
```
1  package Week3;
2
3  public class Q4 {
4
5      public static void main(String[] args) {
6          final double pi = 3.14;
7
8          int radius = 5;
9
10         double area = (pi*radius*radius);
11
12         System.out.println("The area of the circle is:  "+ area +"cm");
13
14         double circumference = (2*pi*radius);
15         System.out.println("The circumference of the circle is "+ circumference+"cm");
16
17     }
18
19 }
20
```

We give a constant for pi = 3.14 (Line 6) and give a value of the radius as 5cm (Line 8). We tell the computer by code that the way to calculate the area of a circle is if you multiply pi times the radius to the power of 2 (Line 10)

We print out "The area of the circle is:" and the result of the area in centimetres.
(Line 12)

Given the radius and pi, we can also calculate the circumference of the circle by the formula (2*pi*radius).
We print out "The circumference of the circle is" and add the result in centimetres (Lines 14 and 15)

Output



Week 4

Short summary about the lecture:

In this lecture we learned how to give the user the ability to input the Scanner and Console, also understood how to format outputs.

Task 1

Q1

Create a class called Average that will ask the user to read 3 numbers A, B and C and work out the average. Display the result as “The average of the 3 numbers is: x”

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Implementation

```
1  package Week4;
2
3
4  import java.util.Scanner;
5
6          public class Average {
7          public static void main(String[] args) {
8
9
10         Scanner input = new Scanner(System.in);
11
12         System.out.println("Enter first number");
13
14         double A = input.nextDouble();
15
16         System.out.println("Enter the second number");
17
18         double B = input.nextDouble();
19
20         System.out.println("Enter the third number");
21
22         double C = input.nextDouble();
23
24
25         double x = (A+B+C) /3;
26
27         System.out.println("The average of the 3 numbers is "+ x);
28
29         }
30         }
```

We import the scanner and we start.
(Lines 4,10)

We ask the user to input 3 different numbers so that the computer can calculate the average out of those 3 numbers.
(Lines 12;16;20)

We use the command “input.nextDouble();” in order to allow the user to input the numbers instead of the computer. We make the variables A, B and C to have the value of whatever the User inputs

Note: The fact that the variable is a double means that only numbers and decimals can be input. If we input a word, an error will occur.

(Lines 14;18;22)

Output

Problems @ Javadoc Declaration Console Coverage

```
<terminated> Average [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (4 Nov 2018, 18:29:21)
Enter first number
2
Enter the second number
6
Enter the third number
9.5
The average of the 3 numbers is 5.833333333333333
```

For an example, we (the user) will input the numbers 2, 6 and 9.5. The program instantly calculates that the average of these three numbers is 5.83.

Task 2

Q1

Create a class called **Cuboid** to read values for width, length and height. Work out the volume of the cuboid and display this result formatted to 0 decimal places.

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Implementation

```
1  package Week4;
2  import java.util.Scanner;
3  public class Cuboidtest {
4
5      public static void main(String[] args) {
6          Scanner input = new Scanner(System.in);
7
8              System.out.println("The width of the cuboid is:");
9
10             double width = input.nextDouble();
11
12             System.out.println("The height of the cuboid is: ");
13
14             double height = input.nextDouble();
15
16             System.out.println("The length of the cuboid is: ");
17
18             double length = input.nextDouble();
19
20             double volume = width  *height * length;
21
22                System.out.println("The volume of the cuboid is "+String.format("%.0f",volume));
23
24
25
26     }
27
28 }
29
```

We import the Scanner and we start.

We use the variables width, height and length to calculate the volume of the cuboid. We state that the values of the variables are dependant on the user input.
On line 22 we print out “The volume of the cuboid is” and the command “String. format(“%.0f, volume))” is used to print out the answer with no decimals.

Output

Console

```
<terminated> Cuboidtest [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 14:44:58)
Give me the width of the cuboid
3
Give me the height of the cuboid
5
Give me the length of the cuboid
7
The volume of the cuboid is 105
```

We (the user) input the values 3,5 and 7 for the width height and length and the program calculates that the volume is 105.

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Task 2

Q3

Create a class called Text and write code using string manipulations.

String p = Enter user input

String q = Enter user input

String r = Enter user input Write code to work out and display:

• (p+q+r) in capital letters (leave a space in between to separate the words)

• Concatenation of (r + p) in lowercase

• total number of characters within (p+q+r)

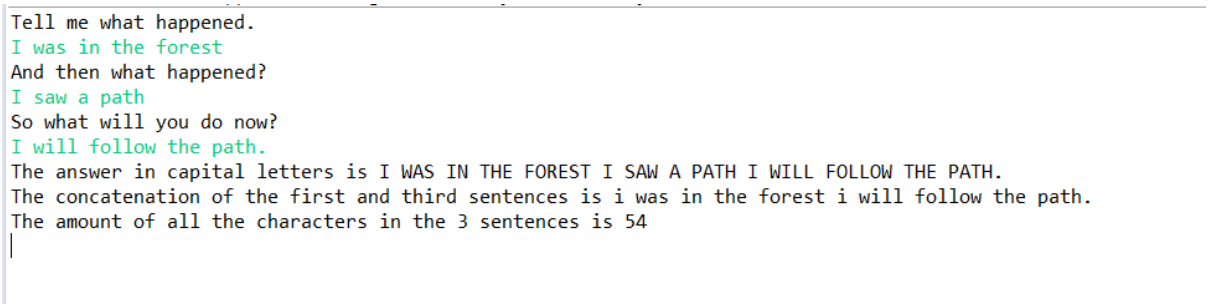
Implementation

```
1  package Week4;
2  import java.util.Scanner;
3  public class Text {
4
5      public static void main(String[] args) {
6
7          Scanner input = new Scanner(System.in);
8
9          System.out.println("Tell me what happened.");
10         String p = input.nextLine();
11
12         System.out.println("And then what happened?");
13         String q = input.nextLine();
14
15         System.out.println("So what will you do now?");
16         String r = input.nextLine();
17
18                 System.out.println("The answer in capital letters is "+ p.toUpperCase()+" " + q.toUpperCase()+" "+ r.toUpperCase());
19
20                 System.out.println("The concatenation of the first and third sentences is "  +p.toLowerCase()+" "+r.toLowerCase());
21
22                 int lengthtotal = p.length()+q.length()+r.length();
23
24                 System.out.println("The amount of all the characters in the 3 sentences is " + lengthtotal);
25
26
27     }
28
29 }
```

We input the Scanner and we print out 3 different lines so that the user could tell us a story. We we use “nextLine” for strings and give the strings the value of the user input.

In order to put the answer in capital letters we need to used the command “p.toUpperCase()” if we want the string p to be in capital letters, and we also use the other strings to make the whole answer in capital letters. In order to do concatenation we type in “p.toLowerCase() + r.toLowerCase()” in order to print out the answer pf the strings “p” and “r” in lowercase letters. And lastly in order to calculate the total characters in all the strings we use the command(stringname).length()”

Output



Task 4

Q4

Create a class called Balance. Prompt the user to input a starting balance and an interest rate. Work out the balances after the first, second and third year.

LOGBOOK

Implementation

```
1  package Week4;
2  import java.util.Scanner;
3  public class balance {
4      public static void main(String[] args) {
5      Scanner input = new Scanner(System.in);
6
7          System.out.println("What is your starting balance? ");
8              double balance = input.nextDouble();
9
10         System.out.println("Select and interest rate(50% = 0.5/100% = 1.0:");
11             double rate = input.nextDouble();
12
13                 double yearone= balance*(rate+1);
14
15                 double yeartwo= yearone*(rate+1);
16
17                 double yearthree= yeartwo*(rate+1);
18
19             System.out.println("Year one: "+"£"+yearone);
20
21             System.out.println("Year two: "+"£"+yeartwo);
22
23             System.out.println("Year three: "+"£"+yearthree);
24     }
25 }
```

Firstly we import the scanner and afterwards we give user input values to balance and rate. The way the interest rate works is that we multiply the current balance with the rate and we add one. We print out the results of year one, two and three.

Output

```
<terminated> balance [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 16:20:3
What is your starting balance?
1625
Select and interest rate(50% = 0.5/100% = 1.0:
0.5
Year one: £2437.5
Year two: £3656.25
Year three: £5484.375
```

We choose our starting balance to be 1625 and our interest rate to be 0.5. The program calculates and this is the result

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Task 5

Q6

Create a class called BMI Body Mass Index (**BMI**) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters.

Write a program to allow the user to enter their weight in pounds and height in inches. Note that if one pound is 0.4535 kilograms and one inch is 0.0254 meters, display the BMI for the user.

Implementation

```
1  package Week4;
2  import java.util.Scanner;
3  public class BMI {
4      public static void main(String[] args) {
5      Scanner input = new Scanner(System.in);
6
7          System.out.println("Write your weight in pounds: ");
8              double weight = input.nextDouble();
9          System.out.println("Write your height in inches: ");
10             double height = input.nextDouble();
11
12                 double weightKG = (weight * 0.4535);
13                 double heightCM = (height *0.0254);
14
15                 double BMI = weightKG/(heightCM*heightCM);
16
17                     System.out.println("Your current BMI is: "+BMI);
18
19
20
21
22
23
24
25
26
27 }
28 }
```

We import the scanner and we give values of weight and height depending on the user input. We used the command “weight *0.4535)” in order to calculate the weight in kilograms and (height * 0.0254) In order to calculate the height in centimetres. The BMI Is calculated by taking your weight in kilograms and dividing it by your height in centimetres to the power of two.

Output

```
<terminated> BMI [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 16:46:03)
Write your weight in pounds:
145
Write your height in inches:
66
Your current BMI is: 23.398606255431066
```

I'm showing how the program works with my own details. I input the values 145 and 66 and it calculates that my BMI is 23, which is the average BMI.

Week 5

Short summary about the lecture:

We learned about If Statements, for loops and while loops. How an if statement works with multi choices and how a for loop and while loop preform.

Task 1

Q1

Write a program that will add the first 100 even numbers

Implementation

```
1  package Week5;
2  public class EvenNos {
3
4      public static void main(String[] args) {
5          int end = 0;
6          int sum = 0;
7          System.out.print("The sum of the first 100 even numbers are: ");
8          for (int i=0; end <= 100; i++ ) {
9              if (i % 2 == 0) {
10             sum += i;
11                 end++;
12             }
13
14
15         }
16             System.out.print(sum);
17     }
18 }
```

We give the values of “end” and “sum” to be 0 and we use a for loop to start from zero and if the number is lower or equal to 100, we add 1. So that adds 100 numbers and the “if statement” states that if that number’s remainder of being divided by 2 is 0, we add it to the sum

Output

```
<terminated> EvenNos [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 17:18:21)
The sum of the first 100 even numbers are: 10100
```

The output of the code is

Task 2

Q3

Create a class called **CharPrint**

Write a program that reads in a word and prints out each character of the word on a separate line. Hint: use a “for” loop and the charAt method.

Implementation

```
1  package Week5;
2  import java.util.Scanner;
3  public class newchar {
4
5      public static void main(String[] args) {
6          Scanner input = new Scanner(System.in);
7              System.out.println("Type any word here: ");
8              String word = input.nextLine();
9
10                 for (int i = 0; i < word.length();i++) {
11                     System.out.println(word.charAt(i));
12                 }
13
14
15
16     }
17
18 }
19
```

We import the scanner and ask the user to input a word of his choice. We use the string “word” and use the command “input.nextLine()”. Afterwards we use a for loop that sets i as 0 and it increases depending on the word length.
We use the command “System.out.println(word.charAt(i))”

charAt is a command that prints out only 1 letter and this is how it works.

Output

```
<terminated> newchar [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 17:31:25)
Type any word here:
Phone
P
h
o
n
e
```

The output of the code is:

Task 3

Q2

Create a class called **LargestDecimal.**

Write a program that prompts the user to enter three different decimal numbers and prints out the largest of them.

LOGBOOK

Implementation

```
1  package Week5;
2  import java.util.Scanner;
3  public class largestnumber {
4
5      public static void main(String[] args) {
6          Scanner input = new Scanner(System.in);
7
8              System.out.println("Type in your first number here: ");
9                  double first = input.nextDouble();
10
11             System.out.println("Type in your second number here: ");
12                 double second = input.nextDouble();
13
14             System.out.println("Type in your second number here: ");
15                 double third = input.nextDouble();
16
17                     if (first > second && first > third) {
18                         System.out.println("The largest number is: "+first );
19                     }else if (second > first && second > third) {
20                         System.out.println("The largest number is: "+second);
21                     }else if (third > first && third > first) {
22                     System.out.println("The largest number is: "+ third);
23                     }else  {
24                         System.out.println("They are all equal.");
25
26     }
27
28 }
29 }
```

We input the scanner and we set 3 variables, “first”, “second” and “third”. We use the “if” statement to tell the program that if the first number is larger than the second and third number, it should be printed. And we have two 3 different outcomes. If the second number is the largest, if the third one is the largest or if they’re equal. If the second one is the largest, we print out the second one with the “else if” statement. We print out the third one also with the “else if” statement, if it’s the largest number of course. The last possible outcome is if they’re all equal and if that’s the case, we print out “They are all equal”

Output

```
<terminated> largestnumber [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 18:09:10)
Type in your first number here:
3
Type in your second number here:
5
Type in your second number here:
4
The largest number is: 5.0
```

In this case, the second number is the largest.

```
<terminated> largestnumber [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 18:17:40)
Type in your first number here:
5
Type in your second number here:
4
Type in your second number here:
3
The largest number is: 5.0
```

In this case, the first number is the largest.

```
<terminated> largestnumber [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 18:18:36)
Type in your first number here:
3
Type in your second number here:
4
Type in your second number here:
5
The largest number is: 5.0
```

In this case, the third number is the largest.

```
Type in your first number here:
5
Type in your second number here:
5
Type in your second number here:
5
They are all equal.
```

In this case, they're all equal.

Task 4

Q4

Create a class called **ReverseWord**

Write a program that reads in a word and prints it out in reverse.

Implementation

```
1  package Week5;
2  import java.util.Scanner;
3
4  public class ReverseWord {
5      public static void main(String[] args) {
6
7          Scanner input = new Scanner(System.in);
8          System.out.println("Please enter a word :");
9          String word = input.nextLine();
10         String reverse = "";
11
12             for(int a = word.length()-1; a >= 0; a--) {
13             reverse = reverse+ word.charAt(a);
14
15         }
16             System.out.print(reverse);
17     }
18
19 }
```

We import the scanner and ask the user to enter a word, whilst we already have set the string word to give it's value depending on the user input. We also give an empty value of the string "reverse", because we will use it in the for loop. The for loop states that a is equal the word length and if a is larger or equal to 0, then remove one from a.

Output

```
<terminated> ReverseWord [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (7 Nov 2018, 18:48:28)
Please enter a word :
Horse
esroH
```

The output of the code is

Task 5

Q7

Write a program to allow the user to enter their weight in pounds and height in inches. Note that if one pound is 0.4535 kilograms and one inch is 0.0254 meters, display the BMI for the user. Add additional lines of code to display a message to say “you are over-weight” if the BMI exceeds 25 or display a message to say “you are under-weight” if the BMI is 20 or less otherwise, display a message to say “you are fine” Make further enhancements to ask the end user how times they want to run this program and then alter your code to accommodate this request

Implementation

```
1  package Week5;
2  import java.util.Scanner;
3  public class BMI {
4
5      public static void main(String[] args) {
6         Scanner input = new Scanner(System.in);
7
8          System.out.println("How many times do you want to run this program ? :");
9              int userInput = input.nextInt();
10             for (int x = 0;x < userInput; x++) {
11
12                 System.out.println("Please state your current weight: ");
13                 double weight = input.nextDouble();
14                 System.out.println("Please state your current height");
15                 double height = input.nextDouble();
16                 double WeightKG = (weight*0.4535);
17                 double heightCM = (height*0.0254);
18                 double BMI = WeightKG/(heightCM*heightCM);
19
20                 System.out.println("Your BMI is "+BMI);
21                 if (BMI >= 25) {
22                 System.out.println("You are over-weight");
23                 }else if (BMI <= 20){
24                 System.out.println("You are under-weight");
25                 }else {
26                 System.out.println("You are in good shape!");
27                 }
28             }
29     }
30
31 }
```

We input the scanner and we give it’s variables. Next thing we do is ask the user how many times he would like to use the program. After that we ask the user to state his current weight as we have stated that the variables “weight” and “height” are dependant on the user input. As we already made a BMI class , I don’t have to explain how to calculate the BMI again. We print out the result and thanks to the “if” and “else if” statements, we will find out if we’re in shape or under/over-weight.

LOGBOOK

Output

```
How many times do you want to run this program ? :
3
Please state your current weight:
145
Please state your current height
66
Your BMI is 23.398606255431066
You are in good shape!

Please state your current weight:
145
Please state your current height
59
Your BMI is 29.280186397201298
You are over-weight

Please state your current weight:
145
Please state your current height
73
Your BMI is 19.126351819977057
You are under-weight
```

We asked the program to run 3 times. We first stated that our weight is 145 and our height is 66, and the outcome is the we're in good shape. After that we input the same weight but reduced the height and the outcome is that we're over-weight. And lastly we input the same weight again , although we changed the height to a higher number (73) and the outcome is that we're under-weight.

LOGBOOK

Week 6

Short summary about the lecture:

In week 6 we learn mainly about methods and what are their uses and how do they work.

Task 1

Q1

Write a method to work out the sum of the first n odd numbers

We input the scanner and we give the value of "sum" to be 0 and the value of "odd" to be dependant on the user integer input. We ask the user how many odd numbers he/she would like to print out. After that, we use a for loop that states that if "i = 0" and the "i" is lower than the odd number that the user input, the program should add. The "if" statement states that if the remainder of the division between "i" and 2 isn't equal to 0, it should be added to the "sum" variable.

Implementation

```
1  package Week6;
2  import java.util.Scanner;
3  public class sumoddnumbers {
4      public static void main(String[] args) {
5          Scanner input = new Scanner(System.in);
6              int sum = 0;
7              System.out.println("How many odd numbers would you like to add?");
8              int odd = input.nextInt();
9
10             for (int i = 0; i < odd; i++)
11                 if (i % 2 != 0) {
12                     sum += i;
13
14                 }
15     System.out.println("The sum of the first "+odd +" odd numbers is: "+sum);
16
17
18     }
19 }
20
```

In the end we print out "The sum of the first" (number that the user input) "odd numbers is: " (the sum of all odd numbers)

Output

```
<terminated> sumoddnumbers [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (8 Nov 2018, 15:53:42)
How much odd numbers would you like to add?
100
The sum of the first 100 odd numbers is: 2500
```

We chose the program to calculate the sum of the first 100 odd numbers. The sum is 2500.

Task 2

Q2

Write a method that will add the first n even numbers

Implementation

```
1  package Week6;
2  import java.util.Scanner;
3  public class summevennumbers {
4      public static void main(String[] args) {
5          Scanner input = new Scanner(System.in);
6              int sum = 0;
7              System.out.println("How many even numbers would you like to add?");
8              int even = input.nextInt();
9
10             for (int i = 0; i < even; i++)
11                 if (i % 2 == 0) {
12                     sum += i;
13
14                 }
15     System.out.println("The sum of the first "+even +" odd numbers is: "+sum);
16
17
18     }
19 }
20
```

This task is quite similar to the last one. The only difference is that the "if" statement states that if the remainder of "i" divided by 2 is 0, then it will be added to the sum.

Output

```
How many even numbers would you like to add?
100
The sum of the first 100 odd numbers is: 2450
```

The output of the code is

Task 3

Q3

Write a method that prompts the user to print out the smallest of three given numbers

Implementation

```
1  package Week6;
2  import java.util.Scanner;
3  public class smallestnumber {
4
5      public static void main(String[] args) {
6          Scanner input = new Scanner(System.in);
7              System.out.println("Note: At least 2 numbers must be different.");
8              System.out.println("Type in your first number here: ");
9                  double first = input.nextDouble();
10
11             System.out.println("Type in your second number here: ");
12                 double second = input.nextDouble();
13
14             System.out.println("Type in your second number here: ");
15                 double third = input.nextDouble();
16
17                     if (first < second && first < third) {
18                         System.out.println("The smallest number is: "+first );
19                     }else if (second < first && second < third) {
20                         System.out.println("The smallest number is: "+second);
21                     }else if (third < first && third < first) {
22                     System.out.println("The smallest number is: "+ third);
23                     }else {
24                         System.out.println("You must provide at least 2 different numbers!");
25                     }
26         }
27     }
```

We use a similar code to week 5's task 3. The only difference is that we turn the ">" signs the other way around.

Output

```
<terminated> smallestnumber [Java Application] C:\Program Files\Java\jre1.8.0_181\bin\javaw.exe (8 Nov 2018, 16:27:07)
Note: At least 2 numbers must be different.
Type in your first number here:
3
Type in your second number here:
4
Type in your second number here:
5
The smallest number is: 3.0
```

First outcome.

```
Note: At least 2 numbers must be different.
Type in your first number here:
4
Type in your second number here:
3
Type in your second number here:
5
The smallest number is: 3.0
```

Second outcome.

```
Note: At least 2 numbers must be different.
Type in your first number here:
5
Type in your second number here:
4
Type in your second number here:
3
The smallest number is: 3.0
```

Third outcome.

```
Note: At least 2 numbers must be different.
Type in your first number here:
10
Type in your second number here:
10
Type in your second number here:
8
The smallest number is: 8.0
```

Forth outcome.

```
Note: At least 2 numbers must be different.
Type in your first number here:
10
Type in your second number here:
10
Type in your second number here:
15
You must provide at least 2 different numbers!
```

Fifth outcome (Error)

Task 4

Q4

Write a method that will work out the sum of the squares for the first n numbers

LOGBOOK

Implementation

```
1  package Week6;
2  import java.util.Scanner;
3  public class squaresum {
4      public static void main(String[] args) {
5          Scanner input = new Scanner(System.in);
6              int sum = 0;
7              System.out.println("How much numbers would you like me to calculate the sum squared of: ");
8              int square = input.nextInt();
9
10             for (int i = 0; i < square; i++)
11
12                     sum += i*i;
13
14
15     System.out.println("The sum of the first "+square +" numbers squared is: "+sum);
16
17
18     }
19 }
20
```

We input the scanner and give the value of sum to be 0 and we ask the user how much numbers would he/she like to calculate the sum of. We give the “square” variable the value of the user input. . After that, we use a for loop that states that if “i = 0” and the “i” is lower than the odd number that the user input, the program should add. We tell the program to add to the sum the “i” times two. Lastly we print out “The sum of the first” (number we put in)

Output

```
How much numbers would you like me to calculate the sum squared of:
10
The sum of the first 10 numbers squared is: 285
```

The output of the code is

Task 5

Q5

Write a method that will display the 1, 8, 27, 64, … up to n and work out the sum for the first n sequence of numbers

LOGBOOK

Implementation

```
1  package Week6;
2  import java.util.Scanner;
3  public class sumsequence {
4      public static void main (String[] args) {
5      Scanner input = new Scanner (System.in);
6
7                  System.out.println("Please insert the amount of elements that will be cubed and added to a sum: ");
8                  int limit = input.nextInt();
9              int sum = 0;
10             for (int i = 1; i <= limit; i++){
11                 int cubed = i*i*i;
12                 System.out.println(cubed);
13                 sum += cubed;
14             }System.out.println("The sum of those n numbers cubed is "+sum);
15     }
16 }
17
```

We input the scanner and ask the user to input the amount of integers he would like to be cubed and summed up. Afterwards we have set a value of limit to be dependant on the user input. We use a for loop that states that if “i” = 0” and the “i” is lower than the “limit” variable that the user input, the program should add. We give the value of the cubed to be “i” multiplied by itself 3 times.

And we also added the sum of all cubed integers in the end and we printed out “The sum of the those n numbers cubed is” and the sum.

Output

```
Please insert the amount of elements that will be cubed and added to a sum:
10
1
8
27
64
125
216
343
512
729
1000
The sum of those n numbers cubed is 3025
```