

<u> OPMS 2018 – Exercise 1</u>

Task 1 (Hello World)

1. Open your Eclipse IDE and select a directory as workspace (most likely this should be your home directory):

Select a dir	ectory as work	space				
Eclipse use	s the workspace of	lirectory to store its p	references and dev	elopment artifacts.		
Workspace:	C:\Users\tobia	s.meisen\eclipse-wor	kspace		~	Browse
Use this	as the default and	l do not ask again				
				Launch		Cancel

- 2. After the Eclipse IDE is launched, close the welcome tab and create a new first project see the pictures below for a How-To description.

	🖨 eclipse	e-workspace - Eclips	e														-		>	×
	File Edit	Source Refactor	N	avigate Se	arch	Project F	tun Wi	ndow	Help											
	New	Alt+Shift+N >	鬯	Java Projec	t		12.	۲	• 🔌	¥ -	~ *	()	> +			[Quick Acc	ess	8 8	影
	Open File		Ľ	Project												E Ta	isk List 🖂		- [
۵,	Open Projects from File System		ŧ	Package												<u>_</u>	- 9- 9	- 59	L	
	Close	Ctrl+W	3	Class												-	•N2			-
	Close All	Ctrl+Shift+W	Ø	Interface												×	18 E '	261		
	Save	Ctrl+S	G	Enum												Ě				
	Save As		@	Annotation	۱											Fin	d Q I	All	Activ	v
C.	Save All	Ctrl+Shift+S	10 #1	Source Fol	der															
	Revert		8	Folder	ng set															
	Move			File												(i) (onnect N	lylyn		
Ľ	Rename	F2	R	Untitled Te	xt File											9	onnect to	your ta	sk and	ALN
8	Refresh	F5	ř	Task												-	utline 192		-	
	Convert Line Delimiters To	>	E	JUnit Test	Case											-= U	utime &		Fo	-
3	Print	Ctrl+P		Example												An ou	tline is not	availab	e" le.	
2	Import		-	Other		Ctrl+N														
4	Export			other	_															
	Properties	Alt+Enter																		
	Switch Workspace	>																		
	Restart																			
	Exit																			
					🖹 P	roblems 🛛	@ Jav	adoc	😡 Deck	aration							*	<u>6</u> 9 ⊽	- (8
					0 iten	ns														
					Desc	ription		^				Resource	Pat	h	Locatio	on	Туре			

Picture 2: Creating a new project

IMA - RWTH Aachen University Institute of Information Management in Mechanical Engineering IMA

				~
eate a Java Project reate a Java project in the workspace or in an	external location.			- h
Project name: MyFirstProject				
Use default location				
Location: C:\Users\tobias.meisen\eclipse-w	orkspace\MyFirstProject		Browse	
JRE				
• Use an execution environment JRE:	JavaSE-1.8			\sim
○ Use a project specific JRE:	jre1.8.0_131			\sim
O Use default JRE (currently 'jre1.8.0_131')		Cor	nfigure JRE	s
Project layout	d class files			
Project layout O Use project folder as root for sources and © Create separate folders for sources and c	d class files class files	Config	jure defau	<u>lt</u>
Project layout O Use project folder as root for sources and Create separate folders for sources and c Working sets	d class files :lass files	Confic	jure defau	<u>lt</u>
Project layout O Use project folder as root for sources and O Create separate folders for sources and c Working sets Add project to working sets	d class files class files	Config	j <u>ure defau</u> New	<u>it</u>

Picture 3: Wizard to create a new project – after entering an appropriate name, click finish

3. Create a new class (HelloWorld) – see the pictures below for more information.

	eclipse-	workspace - Eclips	e						_	
	File Edit	Source Refactor	N	avigate Search Project Ri	un Window Help					
	Vew	Alt+Shift+N >	鬯	Java Project	A - O - X -	a • A • ጭ ↔ • ↔	*		Quick A	ccess
	Open File			Project					Task List	572
	Open Projects from File System		ت	Package					(* • • •	@_
	Close	Ctrl+W	Ø	Class						(d:)
	Close All	Ctrl+Shift+W	C	Interface					× 🕅 🖻	- 18
	ave	Ctrl+S	C	Enum					~	
	ave As		@	Annotation					Find Q	► AI
6	Save All	Ctrl+Shift+S	€°	Source Folder						
	levert		8	Java Working Set						
	Nove			File					(i) Connec	t Mvlv
2	Rename	F2		Untitled Text File					Connect	to you
8	Refresh	F5	1	Task					P= O III	
	Convert Line Delimiters To	>	E	JUnit Test Case					e Outline ∑	5
-	Print	Ctrl+P		Example					An outline is r	not ava
ès	mport		-9	Other Ctrl+N						
4	xport		-							
	Properties	Alt+Enter								
	witch Workspace	>								
	Restart									
	ixit									
				🔝 Problems 🔀	@ Javadoc 强 Declar	ation			*	69
				0 items	<u>^</u>					
				Description	~	Resource	Path	Locati	on Type	

Picture 4: Creating a new class in your project

🖨 New Java Class		\Box \times
Java Class A The use of the d	efault package is discouraged.	C
Source folder:	MyFirstProject/src	Browse
Package:	(default)	Browse
Enclosing type:		Browse
Name: Modifiers:	HelloWorld • public • private	
	abstract final static	
Superclass:	java.lang.Object	Browse
Interfaces:		Add
		Remove
Which method stub	s would you like to create?	
	public static void main(String[] args)	
	Constructors from superclass	
	Inherited abstract methods	
Do you want to add	comments? (Configure templates and default value <u>here</u>)	
?	Finish	Cancel

Picture 5: Enter the class name "HelloWorld" and close the dialog with finish – ignore the warning

4. Add the main()-method, which is the entry point for each Java application. **Hint:** The first main()-method can be found on slide 18 of the lecture.



Picture 6: Adding the main()-method

5. Extend your main()-method by a statement that prints "Hello Aachen" on the console when the application is executed.



Picture 7: Printing "Hello Aachen" to the console

6. Execute your application and look for the right output (see Picture 9).



Picture 8: Executing the application by pressing the simple green circle with white arrow



Picture 9: Result if your application compiled correctly and ran as expected

Task 2 (First Steps)

- 1. Create a new project called "Exercise1".
- 2. Create a new class "Task2" (use the automatic method stub creation available, to create the main()method automatically).
- 3. Implement the following behavior in your main()-method and execute it.
 - a. Create a new integer variable x and assign the value 0.
 - b. Create a new integer variable y and assign the value 5.
 - c. Now create another integer variable z and assign the sum of x and y.
 - d. Print the value of z to the console, so that the following output is generated "The sum of x and y is 5".
 - e. Change the value of x and y and test if your application works as intended.

Extension: Extend your code, so that the value of x and y is printed in round brackets: "The sum of x (0) and y (5) is 5".

Task 3 (Type Casting)

In the following task, you have to answer the given questions. You can note your answers on a piece of paper or in a text document. You are not allowed to use Eclipse during exercises 1.) - 4.) of this task!

- 1. Give one example each for the correct definition of the following data types.
 - String
 - Boolean
 - Double
- 2. Give an example for an explicit type cast!
- 3. Define a constant with the name E and assign in the value 2.71828.
- 4. What is printed by the following statements?
 - a. System.out.println(9.0 / 2);
 - b. System.out.println(3 / 9 * 9);
 - c. System.out.println(9 * 3 / 9);
 - d. System.out.println(5 * (int) 11 / 4.0);
 - e. System.out.println(5 * (int) (11 / 4.0));
 - f. System.out.println((float) 5);

Note: For exercises 5.) - 7.), you are allowed to use Eclipse!

- 5. Create a new class "Task3" inside your project called "Exercise One" (use the automatic method stub creation available, to create the main()-method automatically).
- 6. Implement the expressions from 4.) in the main()-method.
- 7. Compare the results from your implementation in 6.) with your results from 4.). Did the code behave as you expected it to? If not, try to figure out why!

Task 4 (Debugger)

- 1. Open the class "Task2" which you implemented in Task 2.
- 2. Launch the class in debug mode by pressing the green bug right next to the run button. Your program will run until the end and exit as before.



Picture 10: Executing the application in debug mode by pressing the green bug

3. To pause execution place a breakpoint in the code by double clicking on the line number of the first line inside your main()-method. You should see a green circle left to the line number.



Picture 11: Executing the application in debug mode by pressing the green bug

4. Launch the debug mode again. You might be asked, if you want to open the Debug perspective. Press "Yes".

🖨 Cor	nfirm Perspective Switch	×
?	This kind of launch is configured to open the Debug perspective when it suspends. This Debug perspective is designed to support application debugging. It incorporates views for displaying the debug stack, variables and breakpoint management.	
	Do you want to open this perspective now?	
Ren	nember my decision	
	Yes No	

Picture 12: Executing the application in debug mode by pressing the green bug

5. In the upper right window, click on the tab called "Variables". Now you should see a list of variables, which have been set by your program. Since the program is still at the very beginning, the list is still empty (except for the parameter *args* of the main()-method). This will change in the next step.

(x)= Variables 🔀 💁 Breakpoints	
Name	Value
⊡+ no method return value	
() args	String[0] (id=19)

Picture 13: The Variables tab offers a view into the current values behind the variables

6. Click on the "Step Over" function to execute the next line of the code. Watch how the variable list changes.



Picture 14: These buttons are used to control the execution of a program. This way, a programmer can inspect how a program behaves and is able to find mistakes in the code. This process is called debugging.

- 8. Familiarize yourself with the debugger. Set different breakpoints, resume the program (green arrow next to the "Step Over" button).
- 9. If you want to switch out of the debugger perspective, you can do so via Window→Perspective→Open Perspective→Java

🗈 🗈 💀 New Window 🛛 🔿 🗸 🔍 🗸 🤹 🚓 🦽 🦧 😴 🖓 🗸 🖓 🗸 🖏 🖉	÷
Editor >	
Appearance >	
tion]	
ist:54/00 Snow View >	
(Suspended) Perspective > Open Perspective > 🐉 Java	1
ain(String[]) line: 5	
ava\jre-10.0.1\bin\ YMI	
lication] Preferences Save Perspective As	
Ilhost:54770 Reset Perspective Other	
(Suspended)	
) line: not available [local variables unavailable]	
ava\ire-10.0.1\bin\iavaw.exe (03.07.2018_20:21:4: Close All Perspectives	

Picture 15: Change between different perspectives via Window \rightarrow Perspective \rightarrow Open Perspective \rightarrow Java