Informatics I - Exercise 6

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16-921-009

Contents

1   Create and update a git repository

1.1   Github

Link to github: `https://github.com/olikami/Informatics_I-Exercise_6`

1.2   Git commands

1.2.1   `git clone`

Clone a remote git repository locally, will download all the files (including history to the local folder).

1.2.2   `git init`

Initialise a folder to become a local git repository.

1.2.3   `git status`

Display the current status of the git repository, including which files are currently not tracked, have untracked changes or are staged to be commited.

1.2.4   `git add <filepath>`

Add a certain file (or all files in a specific folder) to the staging area, to be commited.

1.2.5   `git add .`

Add all files to the staging area to be commited.

1.2.6 `git commit`

Commit the staged changes, this will open up a text editor where you can enter a message (basically just a text file). When you save the file and exit the editor the commit is made.

1.2.7 `git commit -m <message>`

A more direct way to commit, will take the `<message>` and commit it right away.

1.2.8 `git pull`

Pull all the changes from the remote repository. This updates the local repository. If changes have been made that are clash which each other, the user is asked to fix the errors and merge the errors.

1.2.9 `git push`

Push the changes to the remote repository, which is then update with the local changes. This can only be done if you are up to date (eg. run `git pull`).

1.2.10 `git branch <name>`

Make a new branch with the name given.

1.2.11 `git checkout <branch>`

Change to the given branch.

1.2.12 `git push -u origin <branch>`

With a new branch, the first push has to be made, so that the new branch is also created on the remote repository.

1.2.13 `git merge <branch>`

Merge the given branch into the current branch.

1.2.14 `git log`

Display the log of all the commit with the following information: the hash of the commit, the author of the commit and the commit date.

1.2.15 `git log -p --graph`

Output the log, but with much more info. The `-p` argument gives us all the differences between the commits, while the `--graph` option fives us the lines on the left hand side.

1.3 Output of `git log -p --graph`

I would just like to note, that it isn't my mistake that this pdf is so long, I simply piped the entire log (as asked in the task).

```
* commit 6e490c78186c6c2ca3b0f72eb57915c201d9e7bb
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:   Wed Nov 29 12:24:34 2017 +0100
|
|     Added a very usefull test.py file
|
| diff --git a/test.py b/test.py
| new file mode 100644
| index 0000000..d3e46f2
| --- /dev/null
| +++ b/test.py
| @@ -0,0 +1 @@
| +print('Hello World')
| \ No newline at end of file
|
* commit ca09e9c8c9bed4cc025822f9ea2a7b4d113327a1
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:   Wed Nov 29 11:57:10 2017 +0100
|
|     Finsihed 2.d) 2.
|
| diff --git a/task 2/employee.py b/task 2/employee.py
| index 2a728b1..c32b373 100644
| --- a/task 2/employee.py
| +++ b/task 2/employee.py
| @@ -24,8 +24,14 @@ class Manager(Employee):
|             return 'Manager'
|
|         def get_sales_report(self,salesman):
| -           print('{:s}\'s current cumulative sales:'.format(salesman.get_name()))
| -           print(Salesman.sales[salesman])
| +           try:
| +               if salesman in Salesman.sales.keys():
| +                   print('{:s}\'s current cumulative sales:'.format(salesman.get_name())
    )
| +                   print(Salesman.sales[salesman])
| +               else:
| +                   raise KeyError('{:s} doesn\'t appear to have any sales '.format(
    salesman.get_name()))
| +           except KeyError as e:
| +               print(e)
|
|   class Salesman(Employee):
|
|
* commit 6fa5c34abebbbf954b5a57566c8e650864e59010
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:   Wed Nov 29 11:47:32 2017 +0100
|
|     Finished 2d) 1.
|
| diff --git a/task 2/vehicle.py b/task 2/vehicle.py
| index e0cc4f2..44c220a 100644
| --- a/task 2/vehicle.py
| +++ b/task 2/vehicle.py
| @@ -6,9 +6,13 @@ class Vehicle(object):
|         vehicles_sold = []
|
|         def __init__(self,year,mileage,purchase_price,serial_number):
| -           self._year = year
| -           self._mileage = mileage
| -           self._purchase_price = purchase_price
| +           try:
| +               self._year = int(year)
| +               self._mileage = int(mileage)
| +               self._purchase_price = int(purchase_price)
| +           except ValueError as e:
```

```
| +                print('Error: You didn\'t enter a number for the {:s} variable.'.format(
|    str(e).split(' ')[−1]))  # Say which
| +                # variable generates the error, that's just good manners.
|            self._serial_number = serial_number
|            self._vehicle_id = Vehicle.generate_vehicle_id(self)
|            Vehicle.vehicle_id += 1
| @@ −64,5 +68,5 @@ Veh6 = Motorcycle(1975,75500,40000,"bh545664rh",True)
|   print(Veh1,Veh2,Veh3,Veh4,Veh5,Veh6)
|   #prints        100000  100001  100002  100003  100004  100005
|
| −# Veh7 = Motorcycle("year",10000,25000,"bjhgss4rdh",False)
| +Veh7 = Motorcycle("year",10000,25000,"bjhgss4rdh",False)
|   # instance Veh7 generates an exception (ValueError) (uncomment to test)
|
* commit 493c5110a284cd53cf4c68550338185660650397
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:    Wed Nov 29 11:40:22 2017 +0100
|
|      Finished Task 2c)
|
| diff −−git a/task 2/employee.py b/task 2/employee.py
| index af33b73..2a728b1 100644
| −−− a/task 2/employee.py
| +++ b/task 2/employee.py
| @@ −2,41 +2,40 @@ from vehicle import *
|   from customer import *
|
|   class Employee(object):
| −     ######## CODE MISSING HERE
| +     emp_id = 0
|
|       def __init__(self, name):
| −         pass
| −     ######## CODE MISSING HERE
| +         self._name = name
| +         self._id = Employee.emp_id
| +         Employee.emp_id += 1
|
|       def __str__(self):
| −         pass
| −     ######## CODE MISSING HERE
| +         return 'Employee: {0:s} if of type {1:s}'.format(self.get_name(), self.
|    get_title())
|
|       def get_name(self):
| −         pass
| −     ######## CODE MISSING HERE
| +         return self._name
|
|       def get_title(self):
| −         pass
| −     ######## CODE MISSING HERE
| +         return 'Subordinate'
|
|   class Manager(Employee):
|
|       def get_title(self):
| −         pass
| −     ######## CODE MISSING HERE
| +         return 'Manager'
|
|       def get_sales_report(self,salesman):
| −         pass
| −     ######## CODE MISSING HERE
| +         print('{:s}\'s current cumulative sales:'.format(salesman.get_name()))
| +         print(Salesman.sales[salesman])
|
|   class Salesman(Employee):
|
| −     ######## CODE MISSING HERE
| +     sales = {}
|
|       def sale(self,vehicle,sales_price,customer):
```

```
|  -            pass
|  -     ######## CODE MISSING HERE
|  +            if customer.get_score():
|  +                Salesman.sales[self] = sales_price
|  +            else:
|  +                print('Sorry, but you are not allowed to buy this car.')
|
|
|   ### test cases ###
|  @@ -51,18 +50,18 @@ Craig = Salesman("Craig")
|
|   ## printing employee instances
|
|  -# print(Eric)  # expected output: Employee: Eric is of type Manager
|  -# print(Kyle)  # expected output: Employee: Kyle is of type Subordinate
|  -# print(Stan)  # expected output: Employee: Stan is of type Subordinate
|  -# print(Kenny) # expected output: Employee: Kenny is of type Subordinate
|  -# print(Craig) # expected output: Employee: Craig is of type Subordinate
|  +print(Eric)  # expected output: Employee: Eric is of type Manager
|  +print(Kyle)  # expected output: Employee: Kyle is of type Subordinate
|  +print(Stan)  # expected output: Employee: Stan is of type Subordinate
|  +print(Kenny) # expected output: Employee: Kenny is of type Subordinate
|  +print(Craig) # expected output: Employee: Craig is of type Subordinate
|
|
|   ## registering sales
|
|   Kenny.sale(Veh2,6000,Heidi)
|
|  -# Stan.sale(Veh1,9000,Wendy)
|  +Stan.sale(Veh1,9000,Wendy)
|
|
|   ## printing an individual sales report:
|
*  commit 54a7cd3a3dedb5f0c8c421323ea0a19bb6df7f8c
|  Author: Oliver Kamer <oliver@kamer.ch>
|  Date:   Wed Nov 29 11:25:55 2017 +0100
|
|      Finished execise 2b)
|
|  diff --git a/task 2/customer.py b/task 2/customer.py
|  index 1dd0f23..e8ddee6 100644
|  --- a/task 2/customer.py
|  +++ b/task 2/customer.py
|  @@ -4,27 +4,24 @@ from vehicle import *
|   class Customer(object):
|
|       def __init__(self,name):
|  -         pass
|  -     ######## CODE MISSING HERE
|  +         self._name = name
|  +         self._score = self.credit_score()
|
|       def __str__(self):
|  -         pass
|  -     ######## CODE MISSING HERE
|  +         return 'Customer: {:s}'.format(self._name)
|
|       def credit_score(self):
|  -         pass
|  -     ######## CODE MISSING HERE
|  +         from random import randint
|  +         return randint(0, 100) > 60
|
|       def get_score(self):
|  -         pass
|  -     ######## CODE MISSING HERE
|  +         return self._score
|
|
|   class VIP_Customer(Customer):
|
```

```
        def credit_score(self):
-           pass
-       ######## CODE MISSING HERE
+           return True


  ### test cases ###
@@ -34,8 +31,8 @@ class VIP_Customer(Customer):
  Wendy = Customer("Wendy")
  Heidi = VIP_Customer("Heidi")

-# print(Wendy) # expected output: Customer: Wendy
-# print(Heidi) # expected output: Customer: Heidi
+print(Wendy) # expected output: Customer: Wendy
+print(Heidi) # expected output: Customer: Heidi

-# print(Wendy.get_score()) # expected output: True
-# print(Heidi.get_score()) # expected output: True
+print(Wendy.get_score()) # expected output: True or False
+print(Heidi.get_score()) # expected output: True

* commit 0805f767b3093d06e018f34af7be90b938f46918
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:    Wed Nov 29 11:16:54 2017 +0100
|
|       Finished exercise 2a)
|
| diff --git a/task 2/vehicle.py b/task 2/vehicle.py
| index 2cb41d0..e0cc4f2 100644
| --- a/task 2/vehicle.py
| +++ b/task 2/vehicle.py
| @@ -1,48 +1,53 @@
|  import sys
|
|
| +
|  class Vehicle(object):
| -       ######## CODE MISSING HERE
| +    vehicle_id = 0
| +    vehicles_sold = []
|
|       def __init__(self, year, mileage, purchase_price, serial_number):
| -           pass
| -       ######## CODE MISSING HERE
| -
| -       ######## CODE MISSING HERE
| +           self._year = year
| +           self._mileage = mileage
| +           self._purchase_price = purchase_price
| +           self._serial_number = serial_number
| +           self._vehicle_id = Vehicle.generate_vehicle_id(self)
| +           Vehicle.vehicle_id += 1
|
|       def __str__(self):
| -           pass
| -       ######## CODE MISSING HERE
| +           return str(self.get_id())
|
|       def get_id(self):
| -           pass
| -       ######## CODE MISSING HERE
| +           return self._vehicle_id
|
|       @staticmethod
|       def generate_vehicle_id(self):
| -           pass
| -       ######## CODE MISSING HERE
| +           return Vehicle.vehicle_id + 100000
|
|   class Car(Vehicle):
|
|       def __init__(self, year, mileage, purchase_price, serial_number, doors):
| -           pass
| -       ######## CODE MISSING HERE
```

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```
|   +          super().__init__(year, mileage, purchase_price, serial_number)
|   +          self._doors = doors
|   +          self._wheels = 4
|
|
|   class Lorry(Vehicle):
|
|       def __init__(self, year, mileage, purchase_price, serial_number, wheels, doors=2):
|   -          pass
|   -      ######## CODE MISSING HERE
|   +          super().__init__(year, mileage, purchase_price, serial_number)
|   +          self._doors = doors
|   +          self._wheels = wheels
|
|
|   class Motorcycle(Vehicle):
|
|   -      ######## CODE MISSING HERE
|   +      classic_count = 0
|
|       def __init__(self, year, mileage, purchase_price, serial_number, classic=False):
|   -          pass
|   -      ######## CODE MISSING HERE
|   +          super().__init__(year, mileage, purchase_price, serial_number)
|   +          self._classic = classic
|   +          if classic:
|   +              Motorcycle.classic_count += 1
|
|
|   ### test cases ###
| @@ -56,7 +61,7 @@ Veh4 = Lorry(2005,180000,16000,"hbh997123f",6)
|   Veh5 = Lorry(2013,30000,35000,"hjbf17jbkh",8,4)
|   Veh6 = Motorcycle(1975,75500,40000,"bh545664rh",True)
|
| -#print(Veh1,Veh2,Veh3,Veh4,Veh5,Veh6)
| +print(Veh1,Veh2,Veh3,Veh4,Veh5,Veh6)
|   #prints        100000   100001   100002   100003   100004   100005
|
|   # Veh7 = Motorcycle("year",10000,25000,"bjhgss4rdh",False)
|
* commit f3f8d7ace46e6c1b222814526aed7c59ef2ddf29
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:   Wed Nov 29 11:02:08 2017 +0100
|
|     Update to the gitignore in preparation for the pdflatx aux files
|
| diff --git a/.gitignore b/.gitignore
| index 76c3736..d0b32b3 100644
| --- a/.gitignore
| +++ b/.gitignore
| @@ -19,4 +19,18 @@
|   .idea/**/gradle.xml
|   .idea/**/libraries
|
| -**/__pycache__
| \ No newline at end of file
| +# Strange pychache thingy
| +**/__pycache__
| +
| +# pdflatex auxiliary files:
| +*.aux
| +*.lof
| +*.log
| +*.lot
| +*.fls
| +*.out
| +*.toc
| +*.fmt
| +*.fot
| +*.cb
| +*.cb2
| \ No newline at end of file
|
```

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```
* commit 7f5bada6492f555fecbb9efb86e63803ce45fa1e
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:    Wed Nov 29 11:00:38 2017 +0100
|
|       Update to the student.py file to comply with the excpected output of the comments
|
| diff --git a/task 1/student.py b/task 1/student.py
| index 8721b31..ba03b1f 100644
| --- a/task 1/student.py
| +++ b/task 1/student.py
| @@ -14,7 +14,7 @@ class Student(object):
|
|         def get_list_modules(self):
|             for module in self.modules:
| -             print(module)
| +             print(module.get_title())
|
|         def get_grades(self):
|             for key in self.grades.keys():
|
* commit b56cab9d918cae6985265da01d16aba0375a3b1b
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:    Tue Nov 28 22:17:16 2017 +0100
|
|       Finished task 1c), eventhough it was descirbed horribly
|
| diff --git a/task 1/student.py b/task 1/student.py
| index d99e3ce..8721b31 100644
| --- a/task 1/student.py
| +++ b/task 1/student.py
| @@ -4,20 +4,21 @@ from moduleElement import *
|   class Student(object):
|
|         def __init__(self, name):
| -         pass
| -         ######## CODE MISSING HERE
| +         self.name = name
| +         self.modules = []
| +         self.grades = {}
|
| -     def add_module(self, title):
| -         pass
| -         ######## CODE MISSING HERE
| +     def add_module(self, module):
| +         self.modules.append(module)
| +         self.grades[module.get_title()] = module.get_grade()
|
|         def get_list_modules(self):
| -         pass
| -         ######## CODE MISSING HERE
| +         for module in self.modules:
| +             print(module)
|
|         def get_grades(self):
| -         pass
| -         ######## CODE MISSING HERE
| +         for key in self.grades.keys():
| +             print('{:s}: {:s}'.format(key, str(self.grades[key])))
|
|
|   ### test cases ###
|
* commit 214d0ef1741667f957c99cbe6e98a59b54d604fb
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:    Tue Nov 28 22:16:55 2017 +0100
|
|       Update to the gitignore
|
| diff --git a/.gitignore b/.gitignore
| index abf408d..76c3736 100644
| --- a/.gitignore
| +++ b/.gitignore
| @@ -17,4 +17,6 @@
```

```
|
|   # Gradle:
|   .idea/**/gradle.xml
| -.idea/**/libraries
| \ No newline at end of file
| +.idea/**/libraries
| +
| +**/__pycache__
| \ No newline at end of file
|
* commit 43b8d939b8233c6e1bb8771fe93959a89b14ce42
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:    Tue Nov 28 21:59:57 2017 +0100
|
|       Small updates
|
| diff --git a/.idea/preferred-vcs.xml b/.idea/preferred-vcs.xml
| new file mode 100644
| index 0000000..848cfc4
| --- /dev/null
| +++ b/.idea/preferred-vcs.xml
| @@ -0,0 +1,6 @@
| +<?xml version="1.0" encoding="UTF-8"?>
| +<project version="4">
| +  <component name="PreferredVcsStorage">
| +    <preferredVcsName>ApexVCS</preferredVcsName>
| +  </component>
| +</project>
| \ No newline at end of file
| diff --git a/README.md b/README.md
| index 7eb9b70..c4a15c9 100644
| --- a/README.md
| +++ b/README.md
| @@ -1,2 +1,3 @@
|  # Informatics I - Exercise 6
| -A public repository for the exercise 6 of my studies.
| +
| +A public repository for the exercise 6 of my studies.
| \ No newline at end of file
| diff --git a/okamer_info1_exercise_6.tex b/okamer_info1_exercise_6.tex
| index bcca65b..1de7032 100644
| --- a/okamer_info1_exercise_6.tex
| +++ b/okamer_info1_exercise_6.tex
| @@ -21,6 +21,8 @@
|       \maketitle
|
|       \section*{Task 1.1 d)}
| +
| +
|
|
|   \end{document}
| \ No newline at end of file
|
* commit 8c32ac8bfed15bbb7afb642a7b3d2522edbaea74
| Author: Oliver Kamer <oliver@kamer.ch>
| Date:    Tue Nov 28 20:57:08 2017 +0100
|
|       Finished   exercise 1.b)
|
| diff --git a/task 1/module.py b/task 1/module.py
| index 9b1f2e6..32c063b 100644
| --- a/task 1/module.py
| +++ b/task 1/module.py
| @@ -52,45 +52,39 @@ class Module(object):
|   class Course(Module):
|
|       def __str__(self):
| -          pass
| -          ######## CODE MISSING HERE
| +          return 'Course: {:s}'.format(self.title)
|
|   ############################################################################
```

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```
  class Seminar(Module):

      def __init__(self,ects,title,semester,topic):
-         super().__init__(self, ects, title, semester)
+         super().__init__(ects, title, semester)
          self.topic = topic

      def __str__(self):
-         pass
-         ######## CODE MISSING HERE
+         return '{:s} under the topic: {:s}'.format(self.title, self.topic)

      def get_topic(self):
-         pass
-         ######## CODE MISSING HERE
+         return self.topic

  ##############################################################################

  class Thesis(Module):

      def __init__(self,ects,title,semester,topic,research_group):
-         super().__init__(self, ects, title, semester)
+         super().__init__(ects, title, semester)
          self.topic = topic
          self.research_group = research_group

      def __str__(self):
-         pass
-         ######## CODE MISSING HERE
+         return '{:s} on the topic: {:s} in the Research Group {:s}'.format(self.title
    , self.topic, self.research_group)

      def get_topic(self):
-         pass
-         ######## CODE MISSING HERE
+         return self.research_group

      def get_research_group(self):
-         pass
-         ######## CODE MISSING HERE
+         return self.research_group

  ##############################################################################

@@ -119,14 +113,13 @@ math1.get_important_dates_overview()
  # expected output: 2

  thesis = Thesis(18,"Bachelor Thesis",6,"A promising research topic on Software
   Engineering","SEAL")
-# print(thesis)
+print(thesis)
  # expected output:
-# Bachelor Thesison the topic: A promising research topic on Software Engineering in
   the Research Group SEAL
+# Bachelor Thesis on the topic: A promising research topic on Software Engineering in
    the Research Group SEAL


  sem = Seminar(3,"Seminar in Software Engineering",4,"A Seminar topic")
-# print(sem)
-# print(thesis)
+print(sem)
  # expected output:
  # Seminar in Software Engineering under the topic: A Seminar topic


* commit 2248b7ed2c733c216d875662d3c1daf0de4cb142
  Author: Oliver Kamer <oliver@kamer.ch>
  Date:   Tue Nov 28 20:19:11 2017 +0100

      Small updates
```

```
diff --git a/.idea/workspace.xml b/.idea/workspace.xml
deleted file mode 100644
index 72d63e0..0000000
--- a/.idea/workspace.xml
+++ /dev/null
@@ -1,226 +0,0 @@
-<?xml version="1.0" encoding="UTF-8"?>
-<project version="4">
-  <component name="ChangeListManager">
-    <list default="true" id="e9f1ce76-7f1a-4ce4-a61a-bc774d2a98d2" name="Default"
   comment="" />
-    <option name="EXCLUDED_CONVERTED_TO_IGNORED" value="true" />
-    <option name="TRACKING_ENABLED" value="true" />
-    <option name="SHOW_DIALOG" value="false" />
-    <option name="HIGHLIGHT_CONFLICTS" value="true" />
-    <option name="HIGHLIGHT_NON_ACTIVE_CHANGELIST" value="false" />
-    <option name="LAST_RESOLUTION" value="IGNORE" />
-  </component>
-  <component name="CoverageDataManager">
-    <SUITE FILE_PATH="coverage/Exercise_6$module.coverage" NAME="module Coverage
   Results" MODIFIED="1511892920036" SOURCE_PROVIDER="com.intellij.coverage.
   DefaultCoverageFileProvider" RUNNER="coverage.py" COVERAGE_BY_TEST_ENABLED="true"
   COVERAGE_TRACING_ENABLED="false" WORKING_DIRECTORY="$PROJECT_DIR$/task 1" />
-  </component>
-  <component name="FileEditorManager">
-    <leaf>
-      <file leaf-file-name="student.py" pinned="false" current-in-tab="false">
-        <entry file="file://$PROJECT_DIR$/task 1/student.py">
-          <provider selected="true" editor-type-id="text-editor">
-            <state relative-caret-position="60">
-              <caret line="4" column="0" lean-forward="true" selection-start-line="4"
   selection-start-column="0" selection-end-line="4" selection-end-column="0" />
-              <folding>
-                <element signature="e#0#20#0" expanded="true" />
-              </folding>
-            </state>
-          </provider>
-        </entry>
-      </file>
-      <file leaf-file-name="module.py" pinned="false" current-in-tab="true">
-        <entry file="file://$PROJECT_DIR$/task 1/module.py">
-          <provider selected="true" editor-type-id="text-editor">
-            <state relative-caret-position="-236">
-              <caret line="80" column="44" lean-forward="false" selection-start-line
   ="80" selection-start-column="44" selection-end-line="80" selection-end-column="44"
   />
-              <folding />
-            </state>
-          </provider>
-        </entry>
-      </file>
-      <file leaf-file-name="moduleElement.py" pinned="false" current-in-tab="false">
-        <entry file="file://$PROJECT_DIR$/task 1/moduleElement.py">
-          <provider selected="true" editor-type-id="text-editor">
-            <state relative-caret-position="15">
-              <caret line="1" column="6" lean-forward="false" selection-start-line
   ="1" selection-start-column="6" selection-end-line="1" selection-end-column="6" />
-              <folding />
-            </state>
-          </provider>
-        </entry>
-      </file>
-    </leaf>
-  </component>
-  <component name="IdeDocumentHistory">
-    <option name="CHANGED_PATHS">
-      <list>
-        <option value="$PROJECT_DIR$/task 1/student.py" />
-        <option value="$PROJECT_DIR$/task 1/module.py" />
-      </list>
-    </option>
-  </component>
```

```
| −   <component name="JsBuildToolGruntFileManager" detection−done="true" sorting="
    DEFINITION_ORDER" />
| −   <component name="JsBuildToolPackageJson" detection−done="true" sorting="
    DEFINITION_ORDER" />
| −   <component name="JsGulpfileManager">
| −     <detection−done>true</detection−done>
| −     <sorting>DEFINITION_ORDER</sorting>
| −   </component>
| −   <component name="ProjectFrameBounds" extendedState="6">
| −     <option name="y" value="−1" />
| −     <option name="width" value="1366" />
| −     <option name="height" value="768" />
| −   </component>
| −   <component name="ProjectLevelVcsManager" settingsEditedManually="true" />
| −   <component name="ProjectView">
| −     <navigator currentView="ProjectPane" proportions="" version="1">
| −       <flattenPackages />
| −       <showMembers />
| −       <showModules />
| −       <showLibraryContents />
| −       <hideEmptyPackages />
| −       <abbreviatePackageNames />
| −       <autoscrollToSource />
| −       <autoscrollFromSource />
| −       <sortByType />
| −       <manualOrder />
| −       <foldersAlwaysOnTop value="true" />
| −     </navigator>
| −     <panes>
| −       <pane id="ProjectPane">
| −         <subPane>
| −           <expand>
| −             <path>
| −               <item name="Exercise 6" type="b2602c69:ProjectViewProjectNode" />
| −               <item name="Exercise 6" type="462c0819:PsiDirectoryNode" />
| −             </path>
| −             <path>
| −               <item name="Exercise 6" type="b2602c69:ProjectViewProjectNode" />
| −               <item name="Exercise 6" type="462c0819:PsiDirectoryNode" />
| −               <item name="task 1" type="462c0819:PsiDirectoryNode" />
| −             </path>
| −             <path>
| −               <item name="Exercise 6" type="b2602c69:ProjectViewProjectNode" />
| −               <item name="Exercise 6" type="462c0819:PsiDirectoryNode" />
| −               <item name="task 2" type="462c0819:PsiDirectoryNode" />
| −             </path>
| −           </expand>
| −           <select />
| −         </subPane>
| −       </pane>
| −       <pane id="Scope" />
| −       <pane id="Scratches" />
| −     </panes>
| −   </component>
| −   <component name="PropertiesComponent">
| −     <property name="WebServerToolWindowFactoryState" value="false" />
| −   </component>
| −   <component name="RunDashboard">
| −     <option name="ruleStates">
| −       <list>
| −         <RuleState>
| −           <option name="name" value="ConfigurationTypeDashboardGroupingRule" />
| −         </RuleState>
| −         <RuleState>
| −           <option name="name" value="StatusDashboardGroupingRule" />
| −         </RuleState>
| −       </list>
| −     </option>
| −   </component>
| −   <component name="RunManager" selected="Python.module">
| −     <configuration name="module" type="PythonConfigurationType" factoryName="Python"
    temporary="true">
| −       <option name="INTERPRETER_OPTIONS" value="" />
```

```
| −        <option name="PARENT_ENVS" value="true" />
| −        <envs>
| −          <env name="PYTHONUNBUFFERED" value="1" />
| −        </envs>
| −        <option name="SDK_HOME" value="" />
| −        <option name="WORKING_DIRECTORY" value="$PROJECT_DIR$/task 1" />
| −        <option name="IS_MODULE_SDK" value="true" />
| −        <option name="ADD_CONTENT_ROOTS" value="true" />
| −        <option name="ADD_SOURCE_ROOTS" value="true" />
| −        <module name="Exercise 6" />
| −        <EXTENSION ID="PythonCoverageRunConfigurationExtension" enabled="false"
|    sample_coverage="true" runner="coverage.py" />
| −        <option name="SCRIPT_NAME" value="$PROJECT_DIR$/task 1/module.py" />
| −        <option name="PARAMETERS" value="" />
| −        <option name="SHOW_COMMAND_LINE" value="false" />
| −        <option name="EMULATE_TERMINAL" value="false" />
| −      </configuration>
| −      <recent_temporary>
| −        <list size="1">
| −          <item index="0" class="java.lang.String" itemvalue="Python.module" />
| −        </list>
| −      </recent_temporary>
| −    </component>
| −    <component name="ShelveChangesManager" show_recycled="false">
| −      <option name="remove_strategy" value="false" />
| −    </component>
| −    <component name="TaskManager">
| −      <task active="true" id="Default" summary="Default task">
| −        <changelist id="e9f1ce76−7f1a−4ce4−a61a−bc774d2a98d2" name="Default" comment=""
|    />
| −        <created>1511889896414</created>
| −        <option name="number" value="Default" />
| −        <option name="presentableId" value="Default" />
| −        <updated>1511889896414</updated>
| −      </task>
| −      <servers />
| −    </component>
| −    <component name="ToolWindowManager">
| −      <frame x="0" y="−1" width="1366" height="768" extended−state="6" />
| −      <layout>
| −        <window_info id="Project" active="false" anchor="left" auto_hide="false"
|    internal_type="DOCKED" type="DOCKED" visible="true" show_stripe_button="true" weight
|    ="0.25" sideWeight="0.5" order="0" side_tool="false" content_ui="combo" />
| −        <window_info id="TODO" active="false" anchor="bottom" auto_hide="false"
|    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
|    weight="0.33" sideWeight="0.5" order="6" side_tool="false" content_ui="tabs" />
| −        <window_info id="Event Log" active="false" anchor="bottom" auto_hide="false"
|    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
|    weight="0.33" sideWeight="0.5" order="−1" side_tool="true" content_ui="tabs" />
| −        <window_info id="Database" active="false" anchor="right" auto_hide="false"
|    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
|    weight="0.33" sideWeight="0.5" order="−1" side_tool="false" content_ui="tabs" />
| −        <window_info id="Run" active="false" anchor="bottom" auto_hide="false"
|    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
|    weight="0.32919255" sideWeight="0.5" order="2" side_tool="false" content_ui="tabs"
|    />
| −        <window_info id="Version Control" active="false" anchor="bottom" auto_hide="
|    false" internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="
|    false" weight="0.33" sideWeight="0.5" order="−1" side_tool="false" content_ui="tabs"
|    />
| −        <window_info id="Python Console" active="false" anchor="bottom" auto_hide="
|    false" internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true
|    " weight="0.33" sideWeight="0.5" order="−1" side_tool="false" content_ui="tabs" />
| −        <window_info id="Structure" active="false" anchor="left" auto_hide="false"
|    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
|    weight="0.25" sideWeight="0.5" order="1" side_tool="false" content_ui="tabs" />
| −        <window_info id="Terminal" active="true" anchor="bottom" auto_hide="false"
|    internal_type="DOCKED" type="DOCKED" visible="true" show_stripe_button="true" weight
|    ="0.32919255" sideWeight="0.5" order="−1" side_tool="false" content_ui="tabs" />
| −        <window_info id="Debug" active="false" anchor="bottom" auto_hide="false"
|    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
|    weight="0.4" sideWeight="0.5" order="3" side_tool="false" content_ui="tabs" />
```

```
|  −            <window_info id="Favorites" active="false" anchor="left" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.33" sideWeight="0.5" order="−1" side_tool="true" content_ui="tabs" />
|  −            <window_info id="Data View" active="false" anchor="right" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.33" sideWeight="0.5" order="−1" side_tool="false" content_ui="tabs" />
|  −            <window_info id="Cvs" active="false" anchor="bottom" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.25" sideWeight="0.5" order="4" side_tool="false" content_ui="tabs" />
|  −            <window_info id="Hierarchy" active="false" anchor="right" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.25" sideWeight="0.5" order="2" side_tool="false" content_ui="combo" />
|  −            <window_info id="Message" active="false" anchor="bottom" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.33" sideWeight="0.5" order="0" side_tool="false" content_ui="tabs" />
|  −            <window_info id="Commander" active="false" anchor="right" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.4" sideWeight="0.5" order="0" side_tool="false" content_ui="tabs" />
|  −            <window_info id="Find" active="false" anchor="bottom" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.33" sideWeight="0.5" order="1" side_tool="false" content_ui="tabs" />
|  −            <window_info id="Inspection" active="false" anchor="bottom" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.4" sideWeight="0.5" order="5" side_tool="false" content_ui="tabs" />
|  −            <window_info id="Ant Build" active="false" anchor="right" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.25" sideWeight="0.5" order="1" side_tool="false" content_ui="tabs" />
|  −      </layout>
|  −    </component>
|  −    <component name="TypeScriptGeneratedFilesManager">
|  −      <option name="version" value="1" />
|  −    </component>
|  −    <component name="VcsContentAnnotationSettings">
|  −      <option name="myLimit" value="2678400000" />
|  −    </component>
|  −    <component name="XDebuggerManager">
|  −      <breakpoint−manager />
|  −      <watches−manager />
|  −    </component>
|  −    <component name="editorHistoryManager">
|  −      <entry file="file://$PROJECT_DIR$/task 1/moduleElement.py">
|  −        <provider selected="true" editor−type−id="text−editor">
|  −          <state relative−caret−position="15">
|  −            <caret line="1" column="6" lean−forward="false" selection−start−line="1"
    selection−start−column="6" selection−end−line="1" selection−end−column="6" />
|  −            <folding />
|  −          </state>
|  −        </provider>
|  −      </entry>
|  −      <entry file="file://$PROJECT_DIR$/task 1/student.py">
|  −        <provider selected="true" editor−type−id="text−editor">
|  −          <state relative−caret−position="60">
|  −            <caret line="4" column="0" lean−forward="true" selection−start−line="4"
    selection−start−column="0" selection−end−line="4" selection−end−column="0" />
|  −            <folding>
|  −              <element signature="e#0#20#0" expanded="true" />
|  −            </folding>
|  −          </state>
|  −        </provider>
|  −      </entry>
|  −      <entry file="file://$PROJECT_DIR$/task 1/module.py">
|  −        <provider selected="true" editor−type−id="text−editor">
|  −          <state relative−caret−position="−236">
|  −            <caret line="80" column="44" lean−forward="false" selection−start−line="80"
    selection−start−column="44" selection−end−line="80" selection−end−column="44" />
|  −            <folding />
|  −          </state>
|  −        </provider>
|  −      </entry>
|  −    </component>
|  −</project>
|  \ No newline at end of file
| diff −−git a/README.md b/README.md
```

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```
| index dcc00b2..7eb9b70 100644
| --- a/README.md
| +++ b/README.md
| @@ -1,2 +1,2 @@
| -# Informatics-I---Exercise-6
| +# Informatics I - Exercise 6
|  A public repository for the exercise 6 of my studies.
|
* commit a7e65c81c544235eb89c86523f7ffb34821cba32
| Author: Oliver Kamer <kamero@student.ethz.ch>
| Date:    Tue Nov 28 19:26:51 2017 +0100
|
|      Probably the most important file, because Pycharm keeps creating so many changes
|    in .idea
|
| diff --git a/.gitignore b/.gitignore
| new file mode 100644
| index 0000000..abf408d
| --- /dev/null
| +++ b/.gitignore
| @@ -0,0 +1,20 @@
| +# Covers JetBrains IDEs: IntelliJ, RubyMine, PhpStorm, AppCode, PyCharm, CLion,
|    Android Studio and Webstorm
| +# Reference: https://intellij-support.jetbrains.com/hc/en-us/articles/206544839
| +
| +# User-specific stuff:
| +.idea/workspace.xml
| +.idea/tasks.xml
| +.idea/dictionaries
| +
| +# Sensitive or high-churn files:
| +.idea/**/dataSources/
| +.idea/**/dataSources.ids
| +.idea/**/dataSources.xml
| +.idea/**/dataSources.local.xml
| +.idea/**/sqlDataSources.xml
| +.idea/**/dynamic.xml
| +.idea/**/uiDesigner.xml
| +
| +# Gradle:
| +.idea/**/gradle.xml
| +.idea/**/libraries
| \ No newline at end of file
|
*   commit a85c9f1efedca84e162022b3eb5c99431fe8cfc4
|\  Merge: 19591cc 1478af5
| | Author: Oliver Kamer <kamero@student.ethz.ch>
| | Date:    Tue Nov 28 19:23:39 2017 +0100
| |
| |      Merge branch 'master' of github.com:olikami/Informatics_I-Exercise_6
| |
| * commit 1478af50cdce10ba0fed2886717f1e36449046d7
|   Author: Oliver Kamer <oliver@kamer.ch>
|   Date:    Tue Nov 28 19:13:52 2017 +0100
|
|        Initial commit
|
|   diff --git a/README.md b/README.md
|   new file mode 100644
|   index 0000000..dcc00b2
|   --- /dev/null
|   +++ b/README.md
|   @@ -0,0 +1,2 @@
|   +# Informatics-I---Exercise-6
|   +A public repository for the exercise 6 of my studies.
|
* commit 19591ccbef4f60e6e819fc0a85a3f13d41bb959b
  Author: Oliver Kamer <kamero@student.ethz.ch>
  Date:    Tue Nov 28 19:23:32 2017 +0100

       Inital commit

  diff --git a/.idea/Exercise 6.iml b/.idea/Exercise 6.iml
```

```
new file mode 100644
index 0000000..6711606
--- /dev/null
+++ b/.idea/Exercise 6.iml
@@ -0,0 +1,11 @@
+<?xml version="1.0" encoding="UTF-8"?>
+<module type="PYTHON_MODULE" version="4">
+  <component name="NewModuleRootManager">
+    <content url="file://$MODULE_DIR$" />
+    <orderEntry type="inheritedJdk" />
+    <orderEntry type="sourceFolder" forTests="false" />
+  </component>
+  <component name="TestRunnerService">
+    <option name="PROJECT_TEST_RUNNER" value="Unittests" />
+  </component>
+</module>
\ No newline at end of file
diff --git a/.idea/inspectionProfiles/Project_Default.xml b/.idea/inspectionProfiles/
    Project_Default.xml
new file mode 100644
index 0000000..810d34c
--- /dev/null
+++ b/.idea/inspectionProfiles/Project_Default.xml
@@ -0,0 +1,12 @@
+<component name="InspectionProjectProfileManager">
+  <profile version="1.0">
+    <option name="myName" value="Project Default" />
+    <inspection_tool class="PyUnresolvedReferencesInspection" enabled="true" level="
    WARNING" enabled_by_default="true">
+      <option name="ignoredIdentifiers">
+        <list>
+          <option value="moduleElement" />
+        </list>
+      </option>
+    </inspection_tool>
+  </profile>
+</component>
\ No newline at end of file
diff --git a/.idea/misc.xml b/.idea/misc.xml
new file mode 100644
index 0000000..5bbe586
--- /dev/null
+++ b/.idea/misc.xml
@@ -0,0 +1,4 @@
+<?xml version="1.0" encoding="UTF-8"?>
+<project version="4">
+  <component name="ProjectRootManager" version="2" project-jdk-name="Python 3.5.2 (/
    usr/bin/python3.5)" project-jdk-type="Python SDK" />
+</project>
\ No newline at end of file
diff --git a/.idea/modules.xml b/.idea/modules.xml
new file mode 100644
index 0000000..f98fcbf
--- /dev/null
+++ b/.idea/modules.xml
@@ -0,0 +1,8 @@
+<?xml version="1.0" encoding="UTF-8"?>
+<project version="4">
+  <component name="ProjectModuleManager">
+    <modules>
+      <module fileurl="file://$PROJECT_DIR$/.idea/Exercise 6.iml" filepath="
    $PROJECT_DIR$/.idea/Exercise 6.iml" />
+    </modules>
+  </component>
+</project>
\ No newline at end of file
diff --git a/.idea/vcs.xml b/.idea/vcs.xml
new file mode 100644
index 0000000..94a25f7
--- /dev/null
+++ b/.idea/vcs.xml
@@ -0,0 +1,6 @@
+<?xml version="1.0" encoding="UTF-8"?>
```

```
+<project version="4">
+  <component name="VcsDirectoryMappings">
+    <mapping directory="$PROJECT_DIR$" vcs="Git" />
+  </component>
+</project>
\ No newline at end of file
diff --git a/.idea/workspace.xml b/.idea/workspace.xml
new file mode 100644
index 0000000..72d63e0
--- /dev/null
+++ b/.idea/workspace.xml
@@ -0,0 +1,226 @@
+<?xml version="1.0" encoding="UTF-8"?>
+<project version="4">
+  <component name="ChangeListManager">
+    <list default="true" id="e9f1ce76-7f1a-4ce4-a61a-bc774d2a98d2" name="Default"
    comment="" />
+    <option name="EXCLUDED_CONVERTED_TO_IGNORED" value="true" />
+    <option name="TRACKING_ENABLED" value="true" />
+    <option name="SHOW_DIALOG" value="false" />
+    <option name="HIGHLIGHT_CONFLICTS" value="true" />
+    <option name="HIGHLIGHT_NON_ACTIVE_CHANGELIST" value="false" />
+    <option name="LAST_RESOLUTION" value="IGNORE" />
+  </component>
+  <component name="CoverageDataManager">
+    <SUITE FILE_PATH="coverage/Exercise_6$module.coverage" NAME="module Coverage
    Results" MODIFIED="1511892920036" SOURCE_PROVIDER="com.intellij.coverage.
    DefaultCoverageFileProvider" RUNNER="coverage.py" COVERAGE_BY_TEST_ENABLED="true"
    COVERAGE_TRACING_ENABLED="false" WORKING_DIRECTORY="$PROJECT_DIR$/task 1" />
+  </component>
+  <component name="FileEditorManager">
+    <leaf>
+      <file leaf-file-name="student.py" pinned="false" current-in-tab="false">
+        <entry file="file://$PROJECT_DIR$/task 1/student.py">
+          <provider selected="true" editor-type-id="text-editor">
+            <state relative-caret-position="60">
+              <caret line="4" column="0" lean-forward="true" selection-start-line="4"
    selection-start-column="0" selection-end-line="4" selection-end-column="0" />
+              <folding>
+                <element signature="e#0#20#0" expanded="true" />
+              </folding>
+            </state>
+          </provider>
+        </entry>
+      </file>
+      <file leaf-file-name="module.py" pinned="false" current-in-tab="true">
+        <entry file="file://$PROJECT_DIR$/task 1/module.py">
+          <provider selected="true" editor-type-id="text-editor">
+            <state relative-caret-position="-236">
+              <caret line="80" column="44" lean-forward="false" selection-start-line
    ="80" selection-start-column="44" selection-end-line="80" selection-end-column
    ="44" />
+              <folding />
+            </state>
+          </provider>
+        </entry>
+      </file>
+      <file leaf-file-name="moduleElement.py" pinned="false" current-in-tab="false">
+        <entry file="file://$PROJECT_DIR$/task 1/moduleElement.py">
+          <provider selected="true" editor-type-id="text-editor">
+            <state relative-caret-position="15">
+              <caret line="1" column="6" lean-forward="false" selection-start-line
    ="1" selection-start-column="6" selection-end-line="1" selection-end-column="6" />
+              <folding />
+            </state>
+          </provider>
+        </entry>
+      </file>
+    </leaf>
+  </component>
+  <component name="IdeDocumentHistory">
+    <option name="CHANGED_PATHS">
+      <list>
```

```
+            <option value="$PROJECT_DIR$/task 1/student.py" />
+            <option value="$PROJECT_DIR$/task 1/module.py" />
+          </list>
+        </option>
+    </component>
+    <component name="JsBuildToolGruntFileManager" detection-done="true" sorting="
       DEFINITION_ORDER" />
+    <component name="JsBuildToolPackageJson" detection-done="true" sorting="
       DEFINITION_ORDER" />
+    <component name="JsGulpfileManager">
+      <detection-done>true</detection-done>
+      <sorting>DEFINITION_ORDER</sorting>
+    </component>
+    <component name="ProjectFrameBounds" extendedState="6">
+      <option name="y" value="-1" />
+      <option name="width" value="1366" />
+      <option name="height" value="768" />
+    </component>
+    <component name="ProjectLevelVcsManager" settingsEditedManually="true" />
+    <component name="ProjectView">
+      <navigator currentView="ProjectPane" proportions="" version="1">
+        <flattenPackages />
+        <showMembers />
+        <showModules />
+        <showLibraryContents />
+        <hideEmptyPackages />
+        <abbreviatePackageNames />
+        <autoscrollToSource />
+        <autoscrollFromSource />
+        <sortByType />
+        <manualOrder />
+        <foldersAlwaysOnTop value="true" />
+      </navigator>
+      <panes>
+        <pane id="ProjectPane">
+          <subPane>
+            <expand>
+              <path>
+                <item name="Exercise 6" type="b2602c69:ProjectViewProjectNode" />
+                <item name="Exercise 6" type="462c0819:PsiDirectoryNode" />
+              </path>
+              <path>
+                <item name="Exercise 6" type="b2602c69:ProjectViewProjectNode" />
+                <item name="Exercise 6" type="462c0819:PsiDirectoryNode" />
+                <item name="task 1" type="462c0819:PsiDirectoryNode" />
+              </path>
+              <path>
+                <item name="Exercise 6" type="b2602c69:ProjectViewProjectNode" />
+                <item name="Exercise 6" type="462c0819:PsiDirectoryNode" />
+                <item name="task 2" type="462c0819:PsiDirectoryNode" />
+              </path>
+            </expand>
+            <select />
+          </subPane>
+        </pane>
+        <pane id="Scope" />
+        <pane id="Scratches" />
+      </panes>
+    </component>
+    <component name="PropertiesComponent">
+      <property name="WebServerToolWindowFactoryState" value="false" />
+    </component>
+    <component name="RunDashboard">
+      <option name="ruleStates">
+        <list>
+          <RuleState>
+            <option name="name" value="ConfigurationTypeDashboardGroupingRule" />
+          </RuleState>
+          <RuleState>
+            <option name="name" value="StatusDashboardGroupingRule" />
+          </RuleState>
+        </list>
+      </option>
```

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```
+   </component>
+   <component name="RunManager" selected="Python.module">
+     <configuration name="module" type="PythonConfigurationType" factoryName="Python"
    temporary="true">
+       <option name="INTERPRETER_OPTIONS" value="" />
+       <option name="PARENT_ENVS" value="true" />
+       <envs>
+         <env name="PYTHONUNBUFFERED" value="1" />
+       </envs>
+       <option name="SDK_HOME" value="" />
+       <option name="WORKING_DIRECTORY" value="$PROJECT_DIR$/task 1" />
+       <option name="IS_MODULE_SDK" value="true" />
+       <option name="ADD_CONTENT_ROOTS" value="true" />
+       <option name="ADD_SOURCE_ROOTS" value="true" />
+       <module name="Exercise 6" />
+       <EXTENSION ID="PythonCoverageRunConfigurationExtension" enabled="false"
    sample_coverage="true" runner="coverage.py" />
+       <option name="SCRIPT_NAME" value="$PROJECT_DIR$/task 1/module.py" />
+       <option name="PARAMETERS" value="" />
+       <option name="SHOW_COMMAND_LINE" value="false" />
+       <option name="EMULATE_TERMINAL" value="false" />
+     </configuration>
+     <recent_temporary>
+       <list size="1">
+         <item index="0" class="java.lang.String" itemvalue="Python.module" />
+       </list>
+     </recent_temporary>
+   </component>
+   <component name="ShelveChangesManager" show_recycled="false">
+     <option name="remove_strategy" value="false" />
+   </component>
+   <component name="TaskManager">
+     <task active="true" id="Default" summary="Default task">
+       <changelist id="e9f1ce76-7f1a-4ce4-a61a-bc774d2a98d2" name="Default" comment=""
    />
+       <created>1511889896414</created>
+       <option name="number" value="Default" />
+       <option name="presentableId" value="Default" />
+       <updated>1511889896414</updated>
+     </task>
+     <servers />
+   </component>
+   <component name="ToolWindowManager">
+     <frame x="0" y="-1" width="1366" height="768" extended-state="6" />
+     <layout>
+       <window_info id="Project" active="false" anchor="left" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="true" show_stripe_button="true"
    weight="0.25" sideWeight="0.5" order="0" side_tool="false" content_ui="combo" />
+       <window_info id="TODO" active="false" anchor="bottom" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.33" sideWeight="0.5" order="6" side_tool="false" content_ui="tabs" />
+       <window_info id="Event Log" active="false" anchor="bottom" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.33" sideWeight="0.5" order="-1" side_tool="true" content_ui="tabs" />
+       <window_info id="Database" active="false" anchor="right" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.33" sideWeight="0.5" order="-1" side_tool="false" content_ui="tabs" />
+       <window_info id="Run" active="false" anchor="bottom" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.32919255" sideWeight="0.5" order="2" side_tool="false" content_ui="tabs"
     />
+       <window_info id="Version Control" active="false" anchor="bottom" auto_hide="
    false" internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="
    false" weight="0.33" sideWeight="0.5" order="-1" side_tool="false" content_ui="
    tabs" />
+       <window_info id="Python Console" active="false" anchor="bottom" auto_hide="
    false" internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="
    true" weight="0.33" sideWeight="0.5" order="-1" side_tool="false" content_ui="tabs
    " />
+       <window_info id="Structure" active="false" anchor="left" auto_hide="false"
    internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
    weight="0.25" sideWeight="0.5" order="1" side_tool="false" content_ui="tabs" />
```

```xml
+        <window_info id="Terminal" active="true" anchor="bottom" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="true" show_stripe_button="true"
   weight="0.32919255" sideWeight="0.5" order="-1" side_tool="false" content_ui="tabs
   " />
+        <window_info id="Debug" active="false" anchor="bottom" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.4" sideWeight="0.5" order="3" side_tool="false" content_ui="tabs" />
+        <window_info id="Favorites" active="false" anchor="left" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.33" sideWeight="0.5" order="-1" side_tool="true" content_ui="tabs" />
+        <window_info id="Data View" active="false" anchor="right" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.33" sideWeight="0.5" order="-1" side_tool="false" content_ui="tabs" />
+        <window_info id="Cvs" active="false" anchor="bottom" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.25" sideWeight="0.5" order="4" side_tool="false" content_ui="tabs" />
+        <window_info id="Hierarchy" active="false" anchor="right" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.25" sideWeight="0.5" order="2" side_tool="false" content_ui="combo" />
+        <window_info id="Message" active="false" anchor="bottom" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.33" sideWeight="0.5" order="0" side_tool="false" content_ui="tabs" />
+        <window_info id="Commander" active="false" anchor="right" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.4" sideWeight="0.5" order="0" side_tool="false" content_ui="tabs" />
+        <window_info id="Find" active="false" anchor="bottom" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.33" sideWeight="0.5" order="1" side_tool="false" content_ui="tabs" />
+        <window_info id="Inspection" active="false" anchor="bottom" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.4" sideWeight="0.5" order="5" side_tool="false" content_ui="tabs" />
+        <window_info id="Ant Build" active="false" anchor="right" auto_hide="false"
   internal_type="DOCKED" type="DOCKED" visible="false" show_stripe_button="true"
   weight="0.25" sideWeight="0.5" order="1" side_tool="false" content_ui="tabs" />
+      </layout>
+    </component>
+    <component name="TypeScriptGeneratedFilesManager">
+      <option name="version" value="1" />
+    </component>
+    <component name="VcsContentAnnotationSettings">
+      <option name="myLimit" value="2678400000" />
+    </component>
+    <component name="XDebuggerManager">
+      <breakpoint-manager />
+      <watches-manager />
+    </component>
+    <component name="editorHistoryManager">
+      <entry file="file://$PROJECT_DIR$/task 1/moduleElement.py">
+        <provider selected="true" editor-type-id="text-editor">
+          <state relative-caret-position="15">
+            <caret line="1" column="6" lean-forward="false" selection-start-line="1"
   selection-start-column="6" selection-end-line="1" selection-end-column="6" />
+            <folding />
+          </state>
+        </provider>
+      </entry>
+      <entry file="file://$PROJECT_DIR$/task 1/student.py">
+        <provider selected="true" editor-type-id="text-editor">
+          <state relative-caret-position="60">
+            <caret line="4" column="0" lean-forward="true" selection-start-line="4"
   selection-start-column="0" selection-end-line="4" selection-end-column="0" />
+            <folding>
+              <element signature="e#0#20#0" expanded="true" />
+            </folding>
+          </state>
+        </provider>
+      </entry>
+      <entry file="file://$PROJECT_DIR$/task 1/module.py">
+        <provider selected="true" editor-type-id="text-editor">
+          <state relative-caret-position="-236">
+            <caret line="80" column="44" lean-forward="false" selection-start-line="80"
   selection-start-column="44" selection-end-line="80" selection-end-column="44" />
+            <folding />
```

```
+            </state>
+          </provider>
+       </entry>
+    </component>
+</project>
\ No newline at end of file
diff --git a/okamer_info1_exercise_6.pdf b/okamer_info1_exercise_6.pdf
new file mode 100644
index 0000000..d5fd6a1
Binary files /dev/null and b/okamer_info1_exercise_6.pdf differ
diff --git a/okamer_info1_exercise_6.tex b/okamer_info1_exercise_6.tex
new file mode 100644
index 0000000..bcca65b
--- /dev/null
+++ b/okamer_info1_exercise_6.tex
@@ -0,0 +1,26 @@
+\documentclass[11pt,a4paper]{article}
+\usepackage[utf8]{inputenc}
+\usepackage{graphicx}
+\usepackage{amsmath}
+\author{Oliver Kamer}
+\title{Informatics I - Exercise 6}
+\date{16-921-009}
+
+\usepackage{xcolor}
+\usepackage{url}
+\usepackage{listings}
+
+\lstset{
+    breaklines=true,
+    backgroundcolor=\color{lightgray}
+}
+
+\usepackage[margin=1in]{geometry}
+\begin{document}
+
+    \maketitle
+
+    \section*{Task 1.1 d)}
+
+
+\end{document}
\ No newline at end of file
diff --git a/task 1/.DS_Store b/task 1/.DS_Store
new file mode 100644
index 0000000..e0e54d1
Binary files /dev/null and b/task 1/.DS_Store differ
diff --git a/task 1/__pycache__/moduleElement.cpython-35.pyc b/task 1/__pycache__/
    moduleElement.cpython-35.pyc
new file mode 100644
index 0000000..1019d16
Binary files /dev/null and b/task 1/__pycache__/moduleElement.cpython-35.pyc differ
diff --git a/task 1/module.py b/task 1/module.py
new file mode 100644
index 0000000..9b1f2e6
--- /dev/null
+++ b/task 1/module.py
@@ -0,0 +1,133 @@
+from moduleElement import *
+
+class Module(object):
+
+    module_count = 0
+
+    def __init__(self,ects,title,semester,grade=None):
+        "constructor for class module"
+
+        self.ects = ects
+        self.grade = grade
+        self.title = title
+        self.semester = semester
+
+        self.dates = []
```

```
+
+            self.elements = []
+
+            self.module_count += 1
+
+
+        def get_important_dates_overview(self):
+            "prints all the important dates for a module"
+
+            print("Important dates for {0:s}:".format(self.title))
+
+            for kind, date in self.dates:
+                print("\t{0:s} on {1:s}".format(kind, date))
+
+
+        def set_grade(self, grade):
+            "set the grade to a given value"
+
+            self.grade = grade
+
+
+        def add_module_element(self, other_class, date):
+            "add a new module element to the elements list"
+
+            obj = other_class(self)
+            obj.add_important_date(date)
+            self.elements.append((obj))
+
+        def get_title(self):
+            return self.title
+
+        def get_grade(self):
+            return self.grade
+
+###############################################################################
+
+class Course(Module):
+
+        def __str__(self):
+            pass
+            ######## CODE MISSING HERE
+
+###############################################################################
+
+class Seminar(Module):
+
+        def __init__(self, ects, title, semester, topic):
+            super().__init__(self, ects, title, semester)
+            self.topic = topic
+
+        def __str__(self):
+            pass
+            ######## CODE MISSING HERE
+
+        def get_topic(self):
+            pass
+            ######## CODE MISSING HERE
+
+###############################################################################
+
+class Thesis(Module):
+
+        def __init__(self, ects, title, semester, topic, research_group):
+            super().__init__(self, ects, title, semester)
+            self.topic = topic
+            self.research_group = research_group
+
+        def __str__(self):
+            pass
+            ######## CODE MISSING HERE
+
+        def get_topic(self):
+            pass
```

```
+           ######## CODE MISSING HERE
+
+       def get_research_group(self):
+           pass
+           ######## CODE MISSING HERE
+
+############################################################################
+
+### test cases ###
+
+info1 = Course(6,"Info 1",1)
+info1.add_module_element(Midterm,"31.10.2017")
+info1.add_module_element(FinalExam,"20.12.2017")
+info1.get_important_dates_overview()
+print(info1)
+# expected output:
+# Course: Info 1
+
+math1 = Course(6, "Mathematik I", 1)
+math1.add_module_element(Midterm,"18.12.2017")
+math1.get_important_dates_overview()
+# expected output:
+# Important dates for Info 1:
+#     Midterm on 31.10.2017
+#     Final Exam on 20.12.2017
+# Important dates for Mathematik I:
+#     Midterm on 18.12.2017
+
+
+# print(Module.module_count)
+# expected output: 2
+
+thesis = Thesis(18,"Bachelor Thesis",6,"A promising research topic on Software
+    Engineering","SEAL")
+# print(thesis)
+# expected output:
+# Bachelor Thesison the topic: A promising research topic on Software Engineering in
+    the Research Group SEAL
+
+
+sem = Seminar(3,"Seminar in Software Engineering",4,"A Seminar topic")
+# print(sem)
+# print(thesis)
+# expected output:
+# Seminar in Software Engineering under the topic: A Seminar topic
+
+info1.set_grade(6)
 diff --git a/task 1/moduleElement.py b/task 1/moduleElement.py
new file mode 100644
index 0000000..6e4f741
--- /dev/null
+++ b/task 1/moduleElement.py
@@ -0,0 +1,78 @@
+
+class ModuleElement(object):
+
+    def __init__(self,module):
+        "constructor for class module element"
+
+        # store module as instance variable
+        self.module = module
+
+
+    def add_important_date(self,kind,date):
+        "add a date to the module's date dictionary"
+
+        self.module.dates.append((kind,date))
+
+############################################################################
+
+class Lesson(ModuleElement):
+
+    def __init__(self,module):
```

23

```
+            "constructor for class lesson"
+
+            # call super class constructor
+            ModuleElement.__init__(self, module)
+
+
+    def add_important_date(self, date):
+            "add a lesson to the date dictionary"
+
+            ModuleElement.add_important_date(self, "Lesson", date)
+
+###############################################################################
+
+class Lab(ModuleElement):
+
+    def __init__(self, module):
+            "constructor for class lab"
+
+            # call super class constructor
+            ModuleElement.__init__(self, module)
+
+
+    def add_important_date(self, date):
+            "add a lab session to the date dictionary"
+
+            ModuleElement.add_important_date(self, "Lab Session", date)
+
+###############################################################################
+
+class Midterm(ModuleElement):
+
+    def __init__(self, module):
+            "constructor for class midterm"
+
+            # call super class constructor
+            ModuleElement.__init__(self, module)
+
+
+    def add_important_date(self, date):
+            "add a midterm to the date dictionary"
+
+            ModuleElement.add_important_date(self, "Midterm", date)
+
+###############################################################################
+
+class FinalExam(ModuleElement):
+
+    def __init__(self, module):
+            "constructor for class final exam"
+
+            # call super class constructor
+            ModuleElement.__init__(self, module)
+
+
+    def add_important_date(self, date):
+            "add a final exam to the date dictionary"
+
+            ModuleElement.add_important_date(self, "Final Exam", date)
 diff --git a/task 1/student.py b/task 1/student.py
 new file mode 100644
 index 0000000..d99e3ce
 --- /dev/null
+++ b/task 1/student.py
@@ -0,0 +1,35 @@
+from module import *
+from moduleElement import *
+
+class Student(object):
+
+    def __init__(self, name):
+            pass
+            ######## CODE MISSING HERE
+
```

```
+    def add_module(self, title):
+        pass
+        ######## CODE MISSING HERE
+
+    def get_list_modules(self):
+        pass
+        ######## CODE MISSING HERE
+
+    def get_grades(self):
+        pass
+        ######## CODE MISSING HERE
+
+
+### test cases ###
+
+me = Student("FirstName LastName")
+me.add_module(info1)
+me.get_list_modules()
+# expected output:
+# Modules of Student FirstName LastName:
+#     Info 1
+
+me.get_grades()
+# expected output:
+# Grades of Student FirstName LastName:
+#     Info 1: 6
 diff --git a/task 2/.DS_Store b/task 2/.DS_Store
 new file mode 100644
 index 0000000..56b589b
 Binary files /dev/null and b/task 2/.DS_Store differ
 diff --git a/task 2/customer.py b/task 2/customer.py
 new file mode 100644
 index 0000000..1dd0f23
 --- /dev/null
+++ b/task 2/customer.py
@@ -0,0 +1,41 @@
+from vehicle import *
+
+
+class Customer(object):
+
+    def __init__(self, name):
+        pass
+    ######## CODE MISSING HERE
+
+    def __str__(self):
+        pass
+    ######## CODE MISSING HERE
+
+    def credit_score(self):
+        pass
+    ######## CODE MISSING HERE
+
+    def get_score(self):
+        pass
+    ######## CODE MISSING HERE
+
+
+class VIP_Customer(Customer):
+
+    def credit_score(self):
+        pass
+    ######## CODE MISSING HERE
+
+
+### test cases ###
+
+# initialising customer instances
+
+Wendy = Customer("Wendy")
+Heidi = VIP_Customer("Heidi")
+
+# print(Wendy) # expected output: Customer: Wendy
```

```
+# print(Heidi) # expected output: Customer: Heidi
+
+# print(Wendy.get_score()) # expected output: True
+# print(Heidi.get_score()) # expected output: True
 diff --git a/task 2/employee.py b/task 2/employee.py
 new file mode 100644
 index 0000000..af33b73
 --- /dev/null
 +++ b/task 2/employee.py
 @@ -0,0 +1,73 @@
+from vehicle import *
+from customer import *
+
+class Employee(object):
+    ######## CODE MISSING HERE
+
+    def __init__(self, name):
+        pass
+    ######## CODE MISSING HERE
+
+    def __str__(self):
+        pass
+    ######## CODE MISSING HERE
+
+    def get_name(self):
+        pass
+    ######## CODE MISSING HERE
+
+    def get_title(self):
+        pass
+    ######## CODE MISSING HERE
+
+class Manager(Employee):
+
+    def get_title(self):
+        pass
+    ######## CODE MISSING HERE
+
+    def get_sales_report(self, salesman):
+        pass
+    ######## CODE MISSING HERE
+
+class Salesman(Employee):
+
+    ######## CODE MISSING HERE
+
+    def sale(self, vehicle, sales_price, customer):
+        pass
+    ######## CODE MISSING HERE
+
+
+### test cases ###
+
+## initialising employee instances
+
+Eric = Manager("Eric")
+Kyle = Employee("Kyle")
+Stan = Salesman("Stan")
+Kenny = Salesman("Kenny")
+Craig = Salesman("Craig")
+
+## printing employee instances
+
+# print(Eric) # expected output: Employee: Eric is of type Manager
+# print(Kyle) # expected output: Employee: Kyle is of type Subordinate
+# print(Stan) # expected output: Employee: Stan is of type Subordinate
+# print(Kenny) # expected output: Employee: Kenny is of type Subordinate
+# print(Craig) # expected output: Employee: Craig is of type Subordinate
+
+
+## registering sales
+
+Kenny.sale(Veh2, 6000, Heidi)
```

```python
+
+# Stan.sale(Veh1,9000,Wendy)
+
+
+## printing an individual sales report:
+
+Eric.get_sales_report(Kenny)
+# expected output:
+# Kenny's current cumulative sales:
+# 6000
 diff --git a/task 2/vehicle.py b/task 2/vehicle.py
 new file mode 100644
 index 0000000..2cb41d0
 --- /dev/null
+++ b/task 2/vehicle.py
@@ -0,0 +1,63 @@
+import sys
+
+class Vehicle(object):
+    ######## CODE MISSING HERE
+
+    def __init__(self, year, mileage, purchase_price, serial_number):
+        pass
+    ######## CODE MISSING HERE
+
+    ######## CODE MISSING HERE
+
+    def __str__(self):
+        pass
+    ######## CODE MISSING HERE
+
+    def get_id(self):
+        pass
+    ######## CODE MISSING HERE
+
+    @staticmethod
+    def generate_vehicle_id(self):
+        pass
+    ######## CODE MISSING HERE
+
+class Car(Vehicle):
+
+    def __init__(self, year, mileage, purchase_price, serial_number, doors):
+        pass
+    ######## CODE MISSING HERE
+
+
+class Lorry(Vehicle):
+
+    def __init__(self, year, mileage, purchase_price, serial_number, wheels, doors=2):
+        pass
+    ######## CODE MISSING HERE
+
+
+class Motorcycle(Vehicle):
+
+    ######## CODE MISSING HERE
+
+    def __init__(self, year, mileage, purchase_price, serial_number, classic=False):
+        pass
+    ######## CODE MISSING HERE
+
+
+### test cases ###
+
+# initialising vehicle instances
+
+Veh1 = Vehicle(2008,65000,7500,"34567851g4")
+Veh2 = Car(2007,125000,5500,"e44653ftu1",4)
+Veh3 = Car(2012,45000,8900,"gf5622iguz",doors=2)
+Veh4 = Lorry(2005,180000,16000,"hbh997123f",6)
+Veh5 = Lorry(2013,30000,35000,"hjbf17jbkh",8,4)
+Veh6 = Motorcycle(1975,75500,40000,"bh545664rh",True)
```

```
+
+#print(Veh1,Veh2,Veh3,Veh4,Veh5,Veh6)
+#prints           100000   100001   100002   100003   100004   100005
+
+# Veh7 = Motorcycle("year",10000,25000,"bjhgss4rdh",False)
+# instance Veh7 generates an exception (ValueError) (uncomment to test)
```