**Import …** - importing elements

**Import …\*** - importing all elements from the package

**Instanceof** – operator, which checks if this class extends another one

Static methods **static{…}** happens only once, when you create object

**....equals(…)** – идентичность по значению, == - по положению в памяти если это ссылка

**Scanner** scanner **= new Scanner(System.*in*);** - scanner variable (console in intelIdea)

Type … = scanner**.nextLine();** - similar to cin>> in c++

**Console** console **= System.console()** – variable for input in console (don’t know how to use)

Type … = console**.readLine()** – input in console

**<T, U, …>** - set method or class as multivariable (public class … <T> {…} , static <T> T …(){…} )

Class has to implement class “comparable” and override method compare to be able to compare

**<? Super/extends …>** - when you use collections in methods, you can add this to let pc understand that you will be using parents of child of this class

If you want to get inner class from class you have to write: **inner\_class … = new class().new inner\_class();**

**Strictfp class …** - class with only float values

**Abstract class …** - abstract class

**Final class …**  - final class

**void foo(char a, int... c)** – if you want to add unlimited value

в конструкторе можно вызвать другой конструктор класса методом **this(…);**

**enum имя {… , …}**  - объединения, могут иметь конструкторы и параметры **enum имя {…(…) , …(…); имя() {…}}**

**Color. …** - colors

URLClassLoader loader = new URLClassLoader(new URL[]{new URL("")}); - get variable with classes   
Class cl = loader.loadClass("name"); - load class

To create inner class variable from not connected class: **FatherClass.InnerClass** name **= new FatherClass().new InnerClass();**

To create static variable in the inner class it has to be final

Implement **AutoClosable** and **override close** in class to avoid writing close at the end, just add it to the try parametrs

JavaCompiler compiler = ToolProvider.getSystemJavaCompiler(); - create compiler for java code  
int result = compiler.run(inputStream, outputStream, error, "where"); - compile code and return 1 if it is ok

**Data types and operations with them**

cover of types {

**Integer   
Byte   
Short  
Long   
Boolean   
Character   
Float   
Double**

}

**Integer.parseInt(…)** – string into the int

**Integer.valueOf(…)** – строку в число Integer

**new Intager(…) – parse int integer**

**try { }catch (){ }finally { }** – finally happens in both cases

**assert(…)** – short version of try catch, it checks if the equation(уравнение) is true and if not it breaks the program (you have to add **–ea** to the VM options for this thing to work)

**Catch has arguments:**

**NullPointerException** – when object is incorrectly used

**ArrayIndexOutOfBoundsException** – array exception

**ООП**

**Class … extends … {…}** – наследование

If parent’s constructor needs value you can enter it into the **super(…)**, with is placed in the start of the constructor of the extended class

You can assign extended class to the parent one

**Class …{ {…} – block …(){…} – constructor }** – block apply its code before the constructor

**DATE**

**Date** *date* **= new Date()** – creating data element

**Calendar** *calendar* **= Calendar.*getInstance*();** - creating variable*calendar***.setTime(***…***);** - setting time*calendar***.add(Calendar.*DAY\_OF\_MONTH*, …);** - add date to the current (1 element is defined variable of the Calendar and second is number of *calendar***.getTime();** - getting time

**SimpleDateFormat** *simpleDateFormat* **= new SimpleDateFormat("**dd/M/yy HH:m**");** - creating variable, which will be changing format of time (“dd/M/yy HH:m” – this abbreviator you can find by googling <https://docs.oracle.com/javase/7/docs/api/java/text/SimpleDateFormat.html> )*simpleDateFormat***.format(***date***);** - changing date format

**Collections (interface)**

**ArrayList**

**List/LinkedList**

**Queue**

**Map/HashMap/LinkedHashMap/TreeMap**

**HashSet** – no repeated elements

Has methods:

List<...> list = List.of(..., …); - fast set

**.add(…)** – add element

**.remove(…)** – remove element by id

**.get(…)** – get element by id

**.size()** - size

**PriorityQueue**

**.poll()** – get first element and delete it from array

**.peek()** – get first element

**Hashmap**

**Map … = new HashMap();** - creating variable

**.entrySet()** – swap into set massive

**.keySet()** – swap keys into Set massive

**STRING**

**String … = new String(“…”);** - add a variable ( if you want to concat another str, it will create new variable in RAM) **don’t use if you are going to change it many times**

**StringBuilder … = new StringBuilder(“…”)** – add changeable variable( if you want to concat another str, it wont create new variable in RAM)

**Functions**

**System.gc();** - garbage collector, thing to clean useless rubbish but this function is dangerous to use

you can override method called “finalize”, which turns on, when garbage collector ends its work

**System.exit(0)** – end program

**Cloning**

If you want to clone this class you have to implement it from the **Cloneable** and override method:

**public class … implements Cloneable{  
 @Override  
 protected … clone() throws CloneNotSupportedException{ return (…) super.clone(); }**

**}**

**Create multivariable with many classes inside**

Create class (for example MyProxy), implement **InvocationHandler** and override **public Object invoke (Object proxy, Method method, Object[] args)** – cod there will happen before any classes methd

**InvocationHandler** handler **= new** MyProxy**();** - creating proxy

**Class[]** classes **= new Class[]{**Comparable**.class,** Callable**.class};** - creating array with classes **Object** proxy **= Proxy.*newProxyInstance*(null,** classes**,** handler**);** - creating variable, which includes those classes

splashScreen.update(); - update paint  
}

**Creating .jar programs**

-> Open console

-> go to the needed folder

-> compile main class by “ **javac … .java** “

->create jar file by“ **jar cvfe 1.jar 2 \*.class** “ – 1 – name of the new program, 2 – name of the main class

to open by using web browser : https://www.youtube.com/watch?v=o8zsGW36XJQ&index=148&list=PL786bPIlqEjRDXpAKYbzpdTaOYsWyjtCX

**Loggers**

public static final Logger logger = Logger.getGlobal(); - creating logger with name “global”  
public static final Logger logger2 = Logger.getLogger("personal\_name"); - creating logger with personal name

Handler fileHandler = new FileHandler(); - creating filehandler which will record as a file

Handler fileHandler2 = new ConsoleHandler(); - creating consolehandler which just show message at the console

fileHandler.setFilter(new MyFilter()); - creating filter, where you override method and sort what to add and what not  
logger.setUseParentHandlers(false); - stop showing at the console

logger.addHandler(fileHandler); - set filehandler or consolehandler  
logger.info("…"); - add or show info  
logger.log(Level…., "message"); - add or show message with personal level

class MyFilter implements Filter{  
 @Override  
 public boolean isLoggable(LogRecord record) {  
 return record.getMessage().endsWith("…");  
 }  
}

**Robot**

to use program as you want (move mouse for example)

GraphicsEnvironment graphicsEnvironment = GraphicsEnvironment.getLocalGraphicsEnvironment(); - getting graphics  
GraphicsDevice device = graphicsEnvironment.getDefaultScreenDevice(); - getting screen  
try{  
 Robot robot = new Robot(device); - getting robot  
 robot.mouseMove(x, y); - move mouse  
  
 robot.mousePress(InputEvent….); - press mouse button  
 robot.mouseRelease(InputEvent….); - free mouse button  
  
 Rectangle rectangle = new Rectangle(0,0,jFrame.getWidth(), jFrame.getHeight()); - getting rectangle  
 BufferedImage image = robot.createScreenCapture(rectangle); - getting screenshot by with parametrs  
}catch (AWTException ee){}

**Sorting strings**

List<String> list = new ArrayList<>(); - create array  
Collator collator = Collator.getInstance(); - create variable with rule  
collator.setStrength(Collator.TERTIARY); - set rule  
Collections.sort(list, collator); - sort

**Clever srtings**

String str = "… {0} … {1, date, short}…{2, choice, 0# no one|1# one pizduk|2# {2} or more pizducs}"; - create str with required variable instead of meanings in {}  
String res = MessageFormat.format(str, "vasok", new GregorianCalendar(2018, 10, 15).getTime(), 2); - set values by order 1, 2, 3 … (special one for time)

Adaptive to different countries

Locale locale = new Locale("ua", "UA"); - get variable with local settings of specific region  
System.out.println(Locale.getDefault()); - get your region  
System.out.println(NumberFormat.getCurrencyInstance(locale).format(100)); - format variable (the same with date)

Swap in different countries

(create lots of files with the same start name and format .properties

for example: res. Properties, res\_en. Properties, res\_ua. Properties)

in file values records like: val=1 val2=2 …

ResourceBundle bundledef = ResourceBundle.getBundle("resources", new Locale("","")); - get variable from default file (file without ending \_en ), files have to be .property   
ResourceBundle bundled1 = ResourceBundle.getBundle("resources", new Locale("en", "EN")); ("","")); - get variable from file (file with ending \_en ), files have to be .property   
  
System.out.println(bundledef.getString("val")); - get val

**Set security properties**

System.setProperty("java.security.policy", "src/MyApp.policy"); - set security properties from your own file  
System.setSecurityManager(new SecurityManager()); - set security manager  
System.getProperty("os.name"); - for example what you can allow not to do

grant{ - in file what you had to create  
 permission java.util.PropertyPermission "os.name", "read,write"; - allow to use this command in command line  
 permission java.net.SocketPermission "ip", "connect"; - allow to connect to this socket  
 permission java.io.FilePermission "/tmp/\*", "read,write"; - allow everything in this directory   
};

**MD5 and SHA-1**

String str = "…"; - get str  
MessageDigest shal = MessageDigest.getInstance("SHA-1"); - create hash format  
byte[] bytes = shal.digest(str.getBytes()); - get bytes from hashed str

**Subscribe your .jar file by hash**

[**https://www.youtube.com/watch?v=3EE-8nKaMCQ&index=224&list=PL786bPIlqEjRDXpAKYbzpdTaOYsWyjtCX**](https://www.youtube.com/watch?v=3EE-8nKaMCQ&index=224&list=PL786bPIlqEjRDXpAKYbzpdTaOYsWyjtCX)

**Crypt and decrypt messages**

**AES**

String str = "…"; - create str

Create key by 2 ways

KeyGenerator generator = KeyGenerator.getInstance("AES"); - create generator  
generator.init(128); - size of key  
SecretKey key = generator.generateKey(); - create key  
SecretKey key1 = new SecretKeySpec("13567890".getBytes(), "AES"); - create own key

encrypting

Cipher cipher = Cipher.getInstance("AES"); - create variable with cryptography   
cipher.init(Cipher.ENCRYPT\_MODE, key); - set mode and key  
byte[] bytes = cipher.doFinal(str.getBytes()); - get bytes of encrypted str  
  
cipher.init(Cipher.DECRYPT\_MODE, key); - set decrypting mode and key  
byte[] bytes1 = cipher.doFinal(bytes); - get encrypted bytes

**RSA**

The same as AES, but generate 2 keys (public and private) and encrypt using public? When decrypt is with private

KeyPairGenerator generator = KeyPairGenerator.getInstance("RSA");  
KeyPair keyPair = generator.generateKeyPair();  
Key publicKey = keyPair.getPublic();  
Key privateKey = keyPair.getPrivate();

***Insert JavaScript***

ScriptEngineManager manager = new ScriptEngineManager(); - create manager  
ScriptEngine engine = manager.getEngineByName("JavaScript"); - create variable with language  
  
engine.put("a" , 3); - set variable in “code”  
Object o = engine.eval(“code”); - code something and return object with “returned” variable from code  
Object o2 = ((Invocable)engine).invokeFunction("f","1"); - start function  
engine.get("a"); - get variable

**Link common intagers**

IntegerProperty a = new SimpleIntegerProperty(…); - create dynamic integer, variable of what consist of link, which you can share to another method, common integer won’t change if you change its copy in another method

a.setValue(…); - set

a.get(); - get

**Сереализация – recording objects**

**Deadlock** – зависание программы, мол вызов одной функции, которая в ходе своей работы вызывает пред ведущую и замыкает цикл рекурсии

**127.0.0.1** – localhost

**Native** class – class, which use function from another language for example C++

JNDI – way to record something with key

RMI – create server from your machine and create there class, which will make add requests distantly

JAXB – connect xml with class