Camunda Developer Classes

Clone and checkout

To get your first copy, please enter

```
git clone https://github.com/holisticon/camunda-dev-classes.git
```

Every task covered in the workshop is supported by a lab class. The branch X contains the solution for the class X. To start, checkout `master` and start with `class 1` After you are done, checkout the branch `class/1-process-model` and inspect the solution.

The following branches exist:

```
master
class/1-process-model
class/2-java-delegate
class/3-test-it
class/4-test-it-to-the-end
class/5-delegate-testing
class/6-automatic-approval
class/7-human-workflow
class/8-data-spin
class/9-dmn
class/10-listeners
class/11-bpmn-error
class/12-timer
class/13-messages
```

Please change the branches using:

```
git stash

# or to keep yours
git add --all
git commit -m "my solution"

# then
git checkout class/<class-name>
```

Building

In order to build the project, please enter

```
./mvnw clean install
```

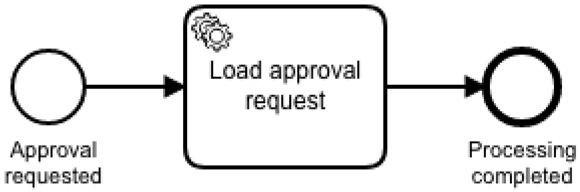
Running examples

In order to run the project, please enter

```
./mvnw spring-boot:run
```

Lab classes

Class 1: Model, start, fail



- Create a process model
  - Put it into (`src/main/resources/approval.bpmn`)
- Process **General Id**: `approval`
- Start event: **async after**
- Service task:
  - id: `service_load_approval_request`
  - name: `Load approval request`
  - details / implementation: `delegate expression`
  - detail / delegate expression: `${loadApprovalRequestDelegate}`
- Start process using Swagger-UI
- Inspect in Cockpit (login: admin/admin)

> All ids in process model are using **Snake Case**
> All references to code are using **Camel case**

> NOTES:
>
> - Check console for exception
> - Why does it happen?
> - Why async after?

Class 2: Java Delegate

- Create a Spring Component
- Implement `JavaDelegate` interface
- Start process using Swagger-UI

```
package de.holisticon.academy.camunda.orchestration.process;

import org.camunda.bpm.engine.delegate.DelegateExecution;
import org.camunda.bpm.engine.delegate.JavaDelegate;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.stereotype.Component;

@Component("loadApprovalRequestDelegate")
public class LoadApprovalRequestDelegate implements JavaDelegate {

  private static final Logger logger =
LoggerFactory.getLogger(LoadApprovalRequestDelegate.class);

  public void execute(DelegateExecution execution) {
    logger.info("Executed by process instance {}", execution.getProcessInstanceId());
  }
}
```

> NOTES:
>
> - See console for log

Class 3: Test it!

- Extend the process runner skeleton
- Implement:
  - deployment test
  - process start test (async)

```
  @Test
  public void shouldDeploy() {
    // no asserts, deployment would throw exception and fail the test on errors
  }

  @Test
  public void shouldStartWaitInApprovalRequested() {
    ProcessInstance instance = this.processBean.start();

    assertThat(instance).isNotNull();
    assertThat(instance).isWaitingAt(Elements.APPROVAL_REQUESTED);
  }
```

> NOTES:
>
> - Look on the empty test method

Class 4: Test it to the end

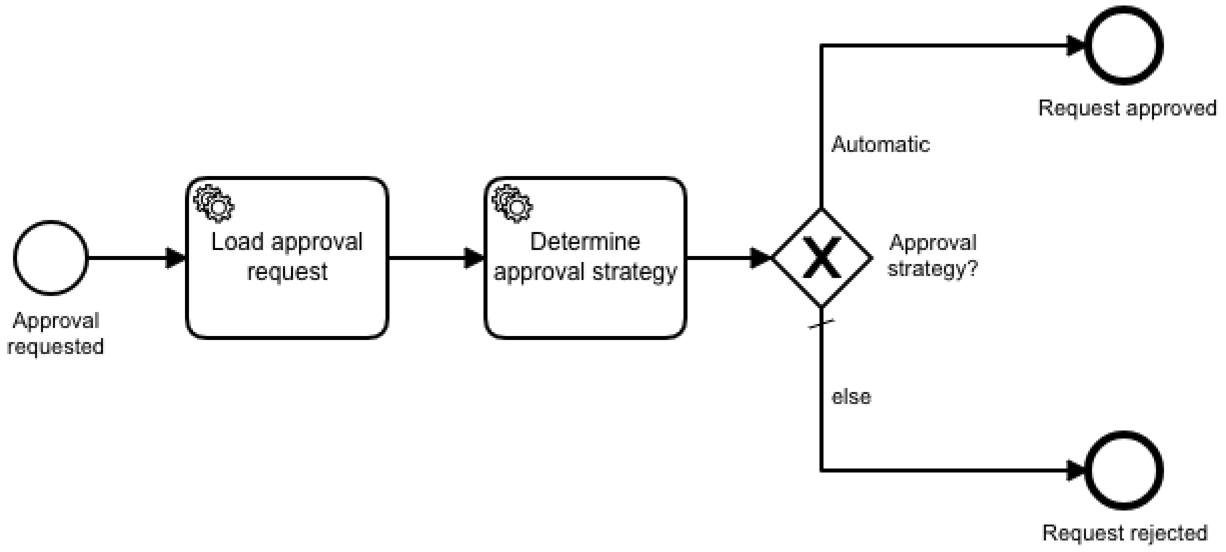
```

  @Before
  public void before() {
    // ...
    Mocks.register(Expressions.LOAD_APPROVAL_REQUEST,
      new LoadApprovalRequestDelegate());
  }

  // Extend the test
  @Test
  public void shouldStartAndLoadAndComplete() {
    ProcessInstance instance = this.processBean.start();

    assertThat(instance).isNotNull();
    assertThat(instance).isWaitingAt(Elements.APPROVAL_REQUESTED);

    execute(job());

    assertThat(instance).isEnded();
    assertThat(instance).hasPassedInOrder(
      Elements.APPROVAL_REQUESTED, Elements.LOAD_APPROVAL_REQUEST, Elements.COMPLETED);

  }
```

> NOTES:
>
> - Try without mock first and see what happens!

Class 5: Delegate testing

- Delegate specification:
  - Use `ApprovalRequestRepository`
  - Load approval request by id (`Variables.APPROVAL_ID`)
  - Store amount (`Variables.AMOUNT`)
- Implement the delegate test
  - Use `Mockito.when().thenReturn()`
  - Use mocking framework: `camunda-bpm-mockito`
  - Use `DelegateExecutionFake`
  - Use Mockito `verify()`

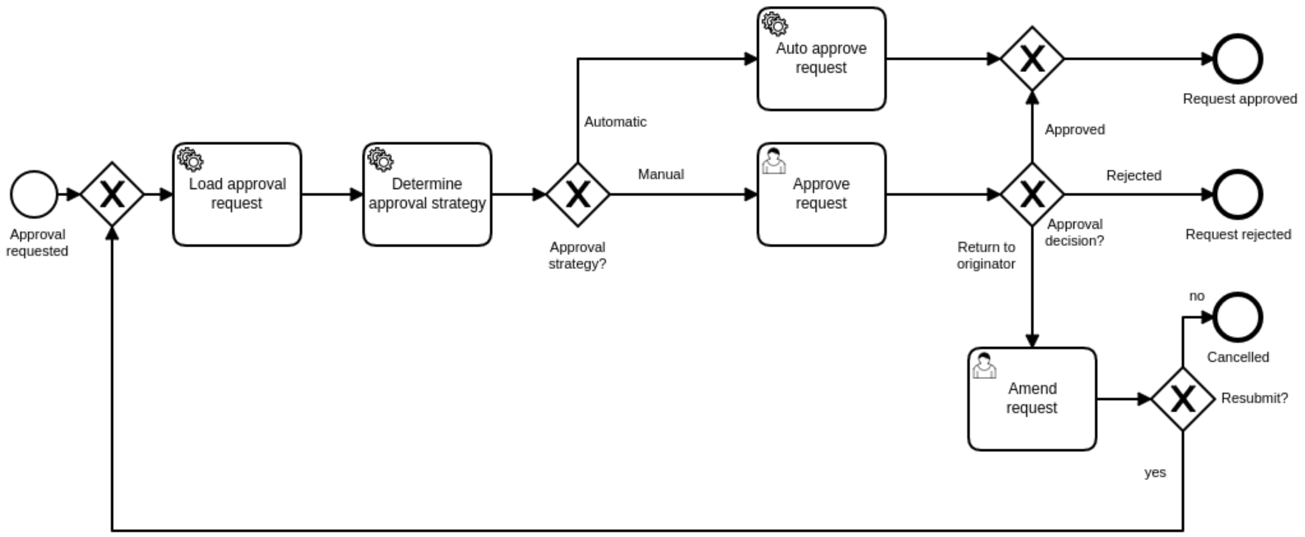
Class 6: Automatic approval



- Extend the process model
- Add Service task which
    - decides about approval strategy
    - automatic approval if amount < 100
- Add XOR gateway and branches
    - Use expression `${approvalStrategy == "Automatic"}`
- Test it!
- Mock delegate in process test
    - Use `CamundaMockito.registerJavaDelegateMock()`
    - Use `onExecutionSetVariables(...)`

> NOTES:
>
> - No delegate classes needed to run the process test!

Class 7: User tasks



- Add user tasks

- Approve request
  - `task-definition-key` : `task_approve_request`
  - set variable `approvalDecision` to one of `APPROVED` , `REJECTED` , `RETURNED`
- Amend request
  - `task-definition-key` : `task_amend_request`
  - set variable `amendAction` to one of `CANCELLED` , `RESUBMIT`
- Test it!
- Try it
  - Use swagger endpoint
  - Check the tasklist

Class 8: Use SPIN

```
<dependency>
  <groupId>org.camunda.bpm</groupId>
  <artifactId>camunda-engine-plugin-spin</artifactId>
  <version>${camunda.version}</version>
</dependency>
<dependency>
  <groupId>org.camunda.spin</groupId>
  <artifactId>camunda-spin-dataformat-json-jackson</artifactId>
  <version>${version.camunda.spin}</version>
</dependency>
```

- Modify the process and store `ApprovalRequest` as variable
- Amend the tests
  - Register plugin for SPIN

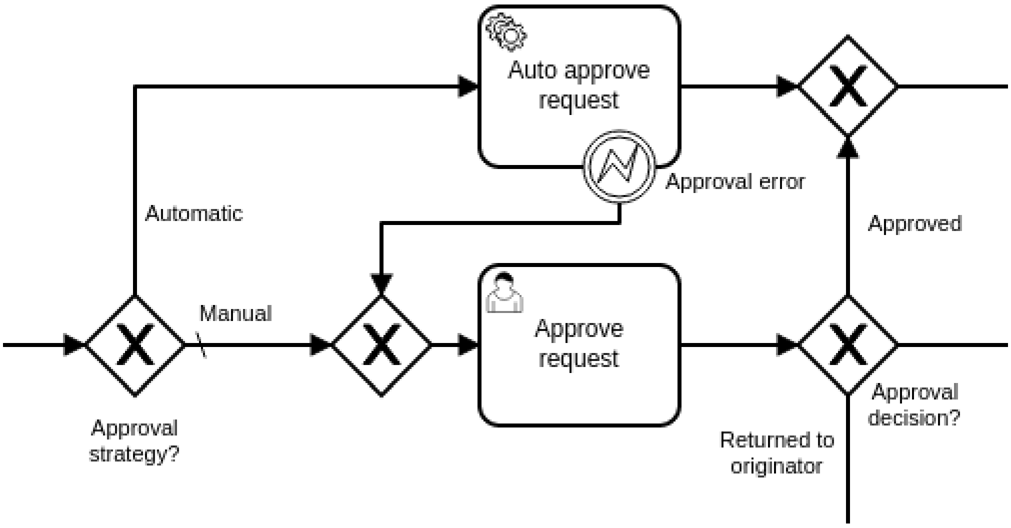
Class 9: Business Rules with DMN

- Use business rule task for `Determine approval strategy`
- Implement the DMN table
- Access `request.amount`
- Policy: First
- Use `singleEntry` as result type
- Adjust the test
- Deploy DMN
- Inspect the engine config
- Remove delegate mock
- Adjust mock for `loadRequest`

Class 10: Listeners

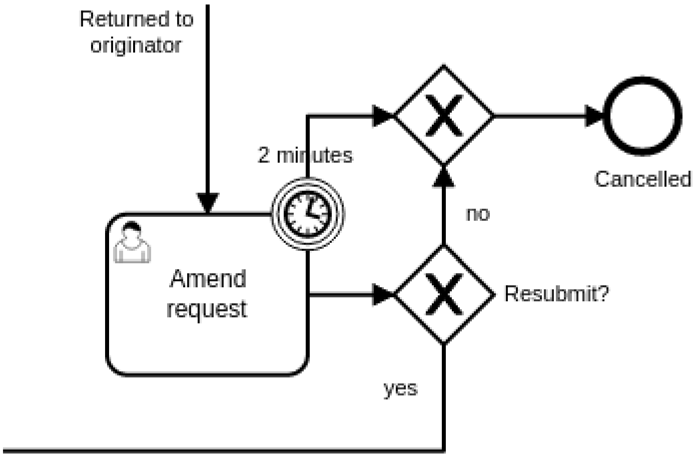
- Add audit trail listners on en events
- Listner should log to console
- Bind as `expression` with

Class 11: BPMN Error



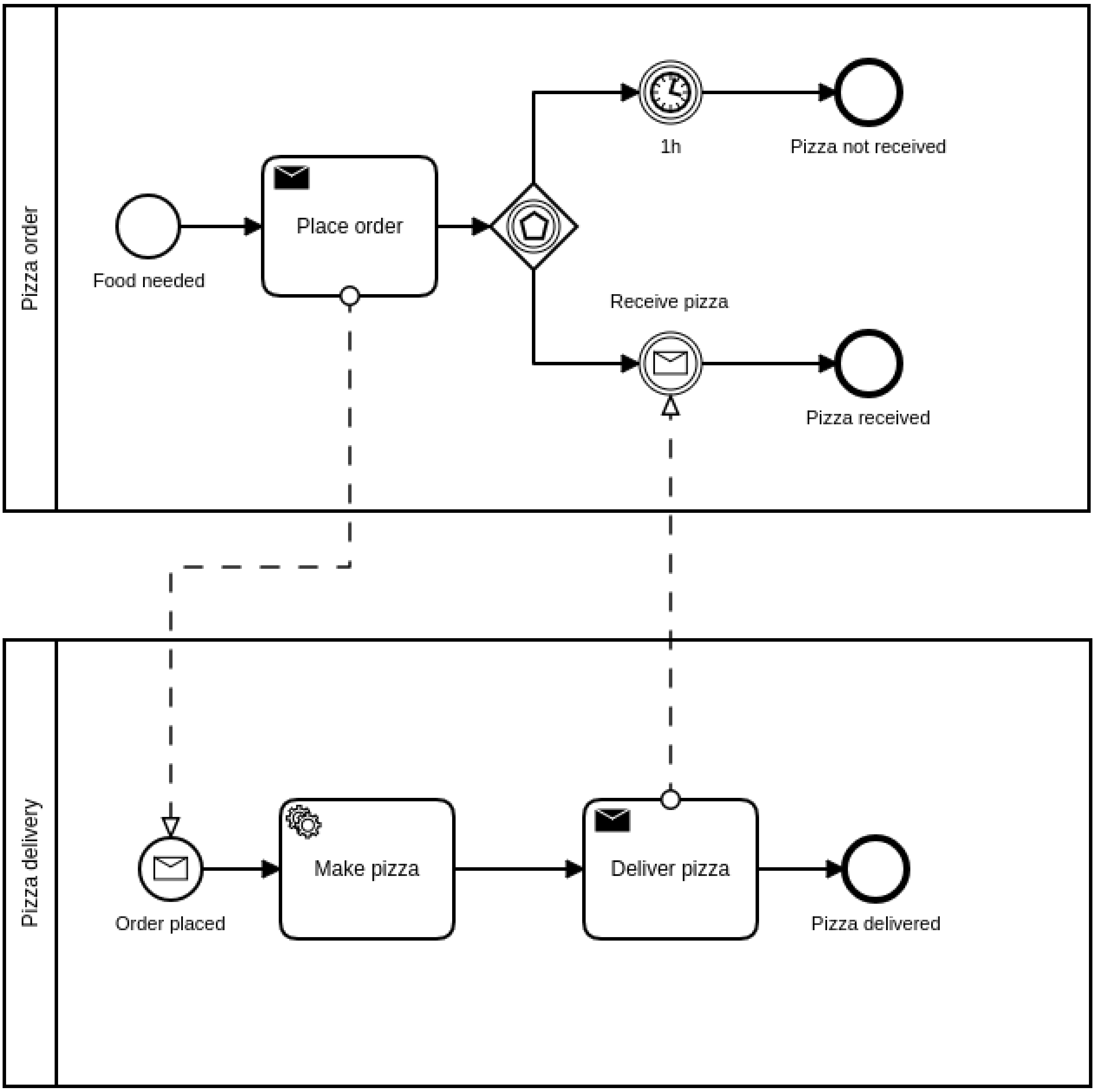
- Integrate BPMN Error with fallback to manual approval
- Adjust the test
- Add new test case
- Change the `automatic approval delegate` stub
- Adjust `automatic approval delegate`
- Try with request `"4"`

Class 12: Timer events



- `Amend request` task should timeout in two minutes
- Request is cancelled if timed-out
- Add a boundary timer event
- What about the test?
- `ClockUtil.setCurrentTime()`

Class 13: Messages



Safe correlation

```
Optional
    .ofNullable(
        this.runtimeService.createExecutionQuery()
            .processInstanceBusinessKey(businessKey)
            .messageEventSubscriptionName(messageName)
            .singleResult()
    ).ifPresent(e ->
        this.runtimeService.createMessageCorrelation(messageName)
            .processInstanceId(e.getProcessInstanceId())
            .correlate()
    );
```

- Start via swagger
- Checkout the Cockpit
- Implement the delegate `PlaceOrderDelegate`
- set `delivered` to `false`
- use correlate message
- pass the business key
- pass the pizza order: `type`, `size`, `delivered`
- Implement the delegate `DeliverPizzaDelegate`
- set `delivered` to `true`
- pass only the `delivered` back
- Checkout the tests