

Laboratory in1278LR Introduction to Programming with Java
Delft University of Technology, Faculty EWI, Software Engineering Research Group.
Group = 3; Remainder = 2

Assignment 2

Create a new directory with the name Assignment2.

Use this directory to save all programs that you will create as part of this assignment.

Part 1, if-then-else

The tolerance of critical components in a system is determined by the application according to the following schedule:

Specification Status	Tolerance
Space Exploration	Less than 0,1 %
Military Grade	Greater than or equal to 0.1 % and less than 1%.
Commercial Grade 1	Greater than or equal to 1% and less than 5 %.
Commercial Grade 2	Greater than or equal to 5% and less than 10%.
Toy Grade	Greater than or equal to 10%.

Using this table, write a Java program that accepts the tolerance reading of a component and determines the specification that should be assigned to the component. Use simple System input and output to accomplish the task.

Part 2, Nested if-then-else

Dutch railway systems is investigating a new pricing structure for their passenger pricing. Usually, prices per km. are higher for short distances than for larger distances. In the new system, prices are also to become dependent on the starting hour of the travel.

The proposed new structure of the prices is as follows:

distance	start time before or equal to 9:00 am	start time later than 9:00 am
0..50 km	€ 0.25 / km	€ 0.20 / km
more than 50 km but less than or equal to 120 km	€ 0.22 / km for the first 50 km; € 0.18 / km for the remaining kms	€ 0.18 / km for the first 50 km; € 0.15 / km for the remaining kms
more than 120 km but less than or equal to 180 km	€ 0.20 / km for the first 50 km; € 0.12 / km for the remaining kms	€ 0.17 / km for the first 50 km; € 0.10 / km for the remaining kms
more than 180 km	€ 0.18 / km for the first 50 km; € 0.11 / km for the remaining kms	€ 0.15 / km for the first 50 km; € 0.09 / km for the remaining kms

- 1) Draw a flowchart (just on a piece of paper) showing the decision structure needed.
- 2) Construct a Java program that, given this table, given a *start time* and a *distance to travel*, calculates the price to pay. You may approximate hours by using doubles and you may express amounts in cents using integers. Incorrect input will be rejected with an appropriate error message after which the program will halt. For input and output you should use GUI-commands as discussed in the book.

Part 3, Loops

Do the exercise by Chapman on page 112, number 11 for both situation (a) and (b). However, instead of performing the calculation for $\theta_1 = 45$ degrees, make a loop over all the values of θ_1 between 0 and 90 degrees in steps of 1 degree including the boundaries.

- 1) Draw a (while-like) flowchart of the requested program. Take care of the special situation occurring.
- 2) Construct a program containing a **while-loop**.
- 3) Construct a program containing a **for-loop**.