Types of DRAKON diagrams

Primitive
  Used for the most simple algorithms

Silhouette
  Recommended for all other algorithms
Primitive
What does a primitive consist of?

Greeting

"Hello everyone!"

End
What does a primitive consist of?

- Greeting
- "Hello everyone!"
- End

A vertical skewer
What does a primitive consist of?

Greeting

"Hello everyone!"

End

The header
What does a primitive consist of?

The algorithm

Greeting

"Hello everyone!"

End
What does a primitive consist of?

The “End” icon
“Action” icon

Greeting

"Hello everyone!"

End

An “Action” icon
“Action” icon

an order to do something
The skewer must be vertical

- Live a day
- Wake up
- Work
- Go to bed
- End
Wrong!
Wrong again

- Use lines instead of arrows
- Arrows create visual noise

In DRAKON, the next icon is always below
Even worse

- It is not allowed to break the skewer
“Insertion” icon

It is a reference to an algorithm that is defined elsewhere.
Logon

Ask for password

Is password correct?
  Yes
  Create session
  No
  Show the "Access denied" screen

End
“If” icon

Contains a question that can be answered “yes” or “no”
The happy path goes straight

The happy path is the most successful and desirable route
The unlucky scenario goes to the right

1. Logon
2. Ask for password
3. Is password correct?
   - Yes: Create session
   - No: Show the "Access denied" screen
4. End
The further to the right, the worse it is
Awkward move

Make a sudden turn at the table

Did you drop the cup?

Did the cup break?

Pick up the cup from the floor

Clean the floor

Collect the fragments

End
Wrong

The happy path is broken
Right

The happy path is straight

Check the wheel

Check the pressure in the tire

Is the pressure normal?

Yes

End

No

Pump the tire
Visual noise is bad

Outage investigation

Was there an outage?

Yes

Did payments reach the bank?

No

Did the system stop?

Yes

Wake up the developers! They must revive the system!

No

Manually send payments

No

End

Assign a low-priority task to the developers

Yes

Too many angles
Horizontal joining

Outage investigation

Was there an outage?

Yes

Did payments reach the bank?

No

Did the system stop?

Yes

Wake up the developers! They must revive the system!

No

Assign a low-priority task to the developers

No

Manually send payments

End
Vertical joining

Removes repetition

Weekend

Is it raining?

Yes

No

Is it cold outside?

Yes

No

Is the sun shining?

Yes

No

Go to the park!

Stay home

End
Line intersections are forbidden
Intersections kill readability
Silhouette

The recommended type of diagrams
What can silhouette do?

- It can cleanly split the diagram into logical parts
- It can represent a finite automaton (state machine)
- It helps get rid of line intersections in complex algorithms
What does a silhouette consist of?

Trip to the office

Get to the bus

Walk outside

Lock the door

Walk to the bus stop

Wait for the bus

Bus trip

Get on the bus

Buy a ticket

Find a seat

Ride until your stop

Leave the bus

Get in the office

Get in the office

Walk to the office

Enter the building

End
Trip to the office

Get to the bus

Walk outside

Lock the door

Walk to the bus stop

Wait for the bus

Bus trip

Get on the bus

Buy a ticket

Find a seat

Ride until your stop

Leave the bus

Get in the office

Get in the office

Enter the building

Walk to the office

End
The branches

Trip to the office

- Get to the bus
  - Walk outside
  - Lock the door
  - Walk to the bus stop
  - Wait for the bus

  Bus trip

- Get on the bus
  - Buy a ticket
  - Find a seat
  - Ride until your stop
  - Leave the bus

  Get in the office

- Walk to the office
  - Enter the building

End
What does a branch consist of?

A header with the branch name

Bus trip

Get on the bus

Buy a ticket

Find a seat

Ride until your stop

Leave the bus

Get in the office
What does a branch consist of?

Bus trip

Get on the bus

Buy a ticket

Find a seat

Ride until your stop

Leave the bus

Get in the office

The algorithm of the branch
What does a branch consist of?

- Bus trip
- Get on the bus
- Buy a ticket
- Find a seat
- Ride until your stop
- Leave the bus
- Get in the office

The address of the next branch
Silhouette answers the three questions of the king:

1. What is the name of the problem?
2. How many parts does the problem have?
3. What are the names of the parts?
1. What is the name of the problem?

**Trip to the office**

- Get to the bus
  - Walk outside
  - Lock the door
  - Walk to the bus stop
  - Wait for the bus

- Bus trip
  - Get on the bus
  - Buy a ticket
  - Find a seat
  - Ride until your stop
  - Leave the bus

- Get in the office
  - Walk to the office
  - Enter the building

End
2. How many problems does the problem have?
3. What are the names of the parts?
The leftmost branch is run first

- Trip to the office
  - Get to the bus
    - Walk outside
    - Lock the door
    - Walk to the bus stop
    - Wait for the bus
  - Bus trip
    - Get on the bus
      - Buy a ticket
      - Find a seat
      - Ride until your stop
      - Leave the bus
    - Get in the office
  - End

- Get in the office
  - Walk to the office
  - Enter the building
Then follow the other branches
The rightmost branch goes last

Trip to the office

Get to the bus
- Walk outside
- Lock the door
- Walk to the bus stop
- Wait for the bus

Bus trip
- Get on the bus
- Buy a ticket
- Find a seat
- Ride until your stop
- Leave the bus

Get in the office
- Walk to the office
- Enter the building

End
There can be only one “End” icon on the DRAKON diagram
The order of branches is defined in the “Address” icons.
The branches should be sorted left-to-right.
When is it allowed to go to the left?

1. When some branches need to be repeated.
2. When the diagram represents a finite automaton (state machine).
A branch can have several “Address” icons

The algorithm of such branch decides which branch to run next
A direct jump from one branch to another is forbidden.
Icon “Select”

Contains a question:

• that cannot be answered “yes” or “no”
• that can have several answers
Icon “Select”

Knight at a crossroad

Where to go?

To the left
You will find nothing

Straight ahead
You will lose your horse

To the right
You will lose your life

End
How to arrange the answers?

- Following the principle “The further to the right, the worse it is”
- Following the principle “The further to the right, the larger it is”
- Following the principle “The further to the right, the higher it is”

The key thing is to sort the answers.
The further to the right, the larger it is

End of party

How much vodka did you drink?

None
- Drive home safely

0.1 - 0.5 liter
- Call the taxi

0.6 - 1.0 liter
- Fall on the floor

More
- Call the ambulance

End
Loops
Lift the weight while not tired

Workout

Lift the weight

Tired?

Yes

End

No
The body of this loop is run at least once.

Flowchart:
- **Workout**
- **Lift the weight**
  - **Tired?**
    - **Yes**: End
    - **No**: Workout
Hungry?
If yes, then eat a hamburger start from the beginning
If no, then leave
This loop is skipped if the condition is not met.
The loop condition is inside the loop body

1. Read a file line by line
2. Read a line
3. End of file reached?
   - Yes: End
   - No: Add the line to the list
"For each" loop

Birthday party

For each cake

Take a bite

Next cake

End
There can be several exits from a loop

1. Reasonable birthday
   - For each cake
   - Take a bite
   - Still hungry?
     - Yes: Next cake
     - No: End
There can be only ONE ENTRANCE into a loop

Wrong! A second entrance is not allowed
Begin a work day

Talk to colleagues
Discuss weather
Discuss sports
Discuss movies

Eat something

Eat a hamburger
Still hungry?
Yes

The Address icon below points at the same branch and forms a loop.

No

Eat something

Prepare for work

Take a nap

End
Silhouette loop: some branches are run several times

Begin a work day

Talk to colleagues

Discuss weather

Discuss sports

Discuss movies

Eat something

Eat a hamburger

Still hungry?

Yes

The Address icon below points at the same branch and forms a loop.

Prepare for work

No

Eat something

End

Prepare for work

Take a nap
“Select” loop

Fishing

Cast the rod

What have you caught?

A big fish
Call your friends

A small fish

Nothing

Go home

End
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The diagrams on the slides were made with DRAKON Editor
http://drakon-editor.sourceforge.net/

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