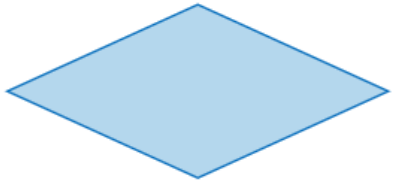
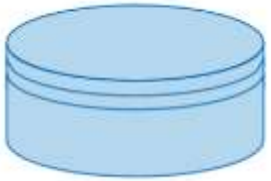
Flow Charts

11.2.1.7 use flow charts to input, process, store, and output data in computing systems

What are the Basic Symbols of a Flowchart?

Start/End Symbol The terminator symbol marks the starting or ending point of the system. It usually contains the word "Start" or "End."	
Action or Process Symbol A box can represent a single step ("add two cups of flour"), or and entire sub-process ("make bread") within a larger process.	
Decision Symbol A decision or branching point. Lines representing different decisions emerge from different points of the diamond.	

Input/Output Symbol Represents material or information entering or leaving the system, such as customer order (input) or a product (output).	
Database Symbol Indicates a list of information with a standard structure that allows for searching and sorting.	
Arrows A line is a connector that shows relationships between the representative shapes	

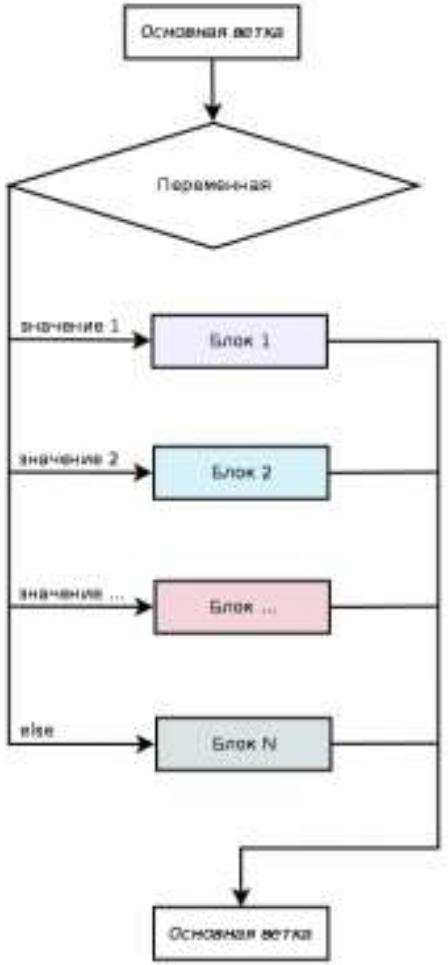
The numbers of flowcharts must match the number of processes in the data flow diagram.

Let’s remember

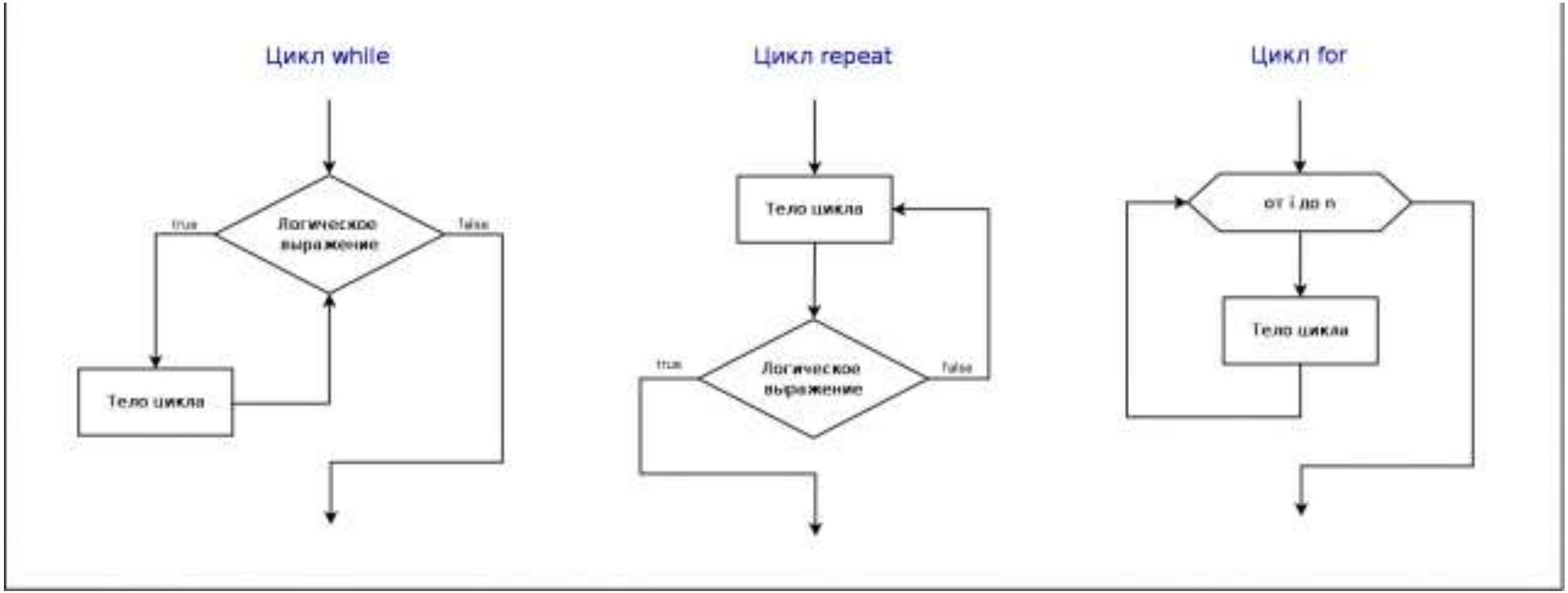
Оператор if-else

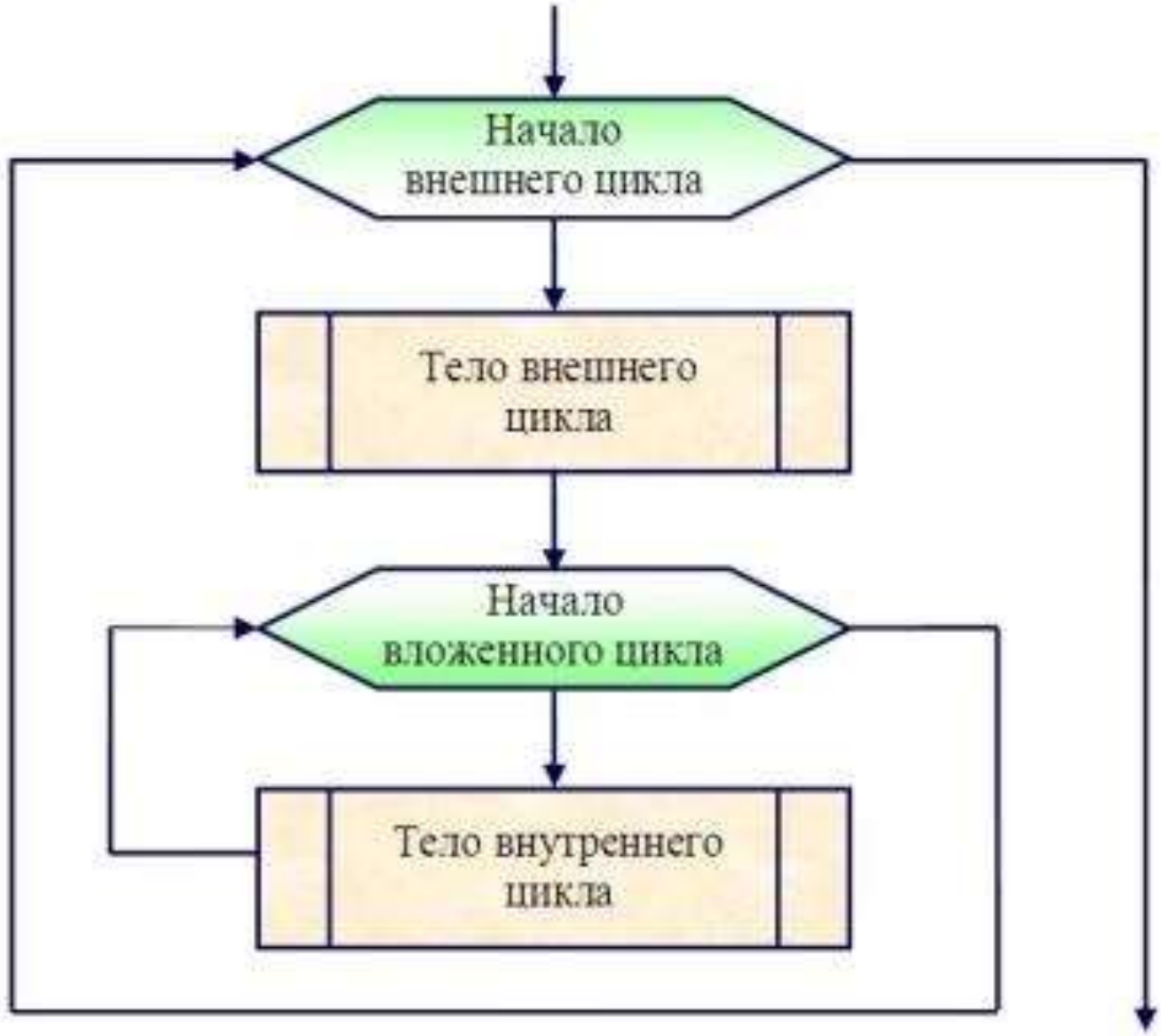
Неполная форма (If)

Оператор case



Cyclical flowchart




Начало
внешнего цикла
Тело внешнего
цикла
Начало
вложенного цикла
Тело внутреннего
цикла

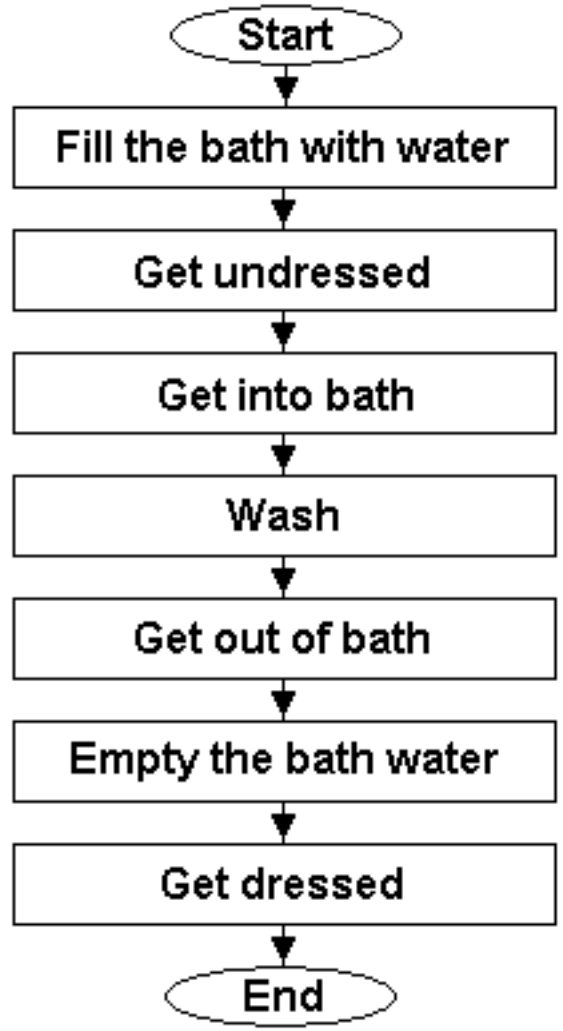
Flow Chart Example 1

We will now draw a flow chart for having a bath.

We start by thinking about the steps involved:
(1) Fill the bath with water
(2) Get undressed.
(3) Get into bath.
(4) Wash.
(5) Get out of bath.
(6) Empty the bath water.
(7) Get dressed.

Now we need to draw the chart with instruction boxes. There are no decisions on this chart - the steps all follow on from one another. Remember the **Start** and **End** boxes.

The final chart is shown on the right. Of course some people might do some of these steps in a different order, but hopefully they get undressed before getting in the bath!



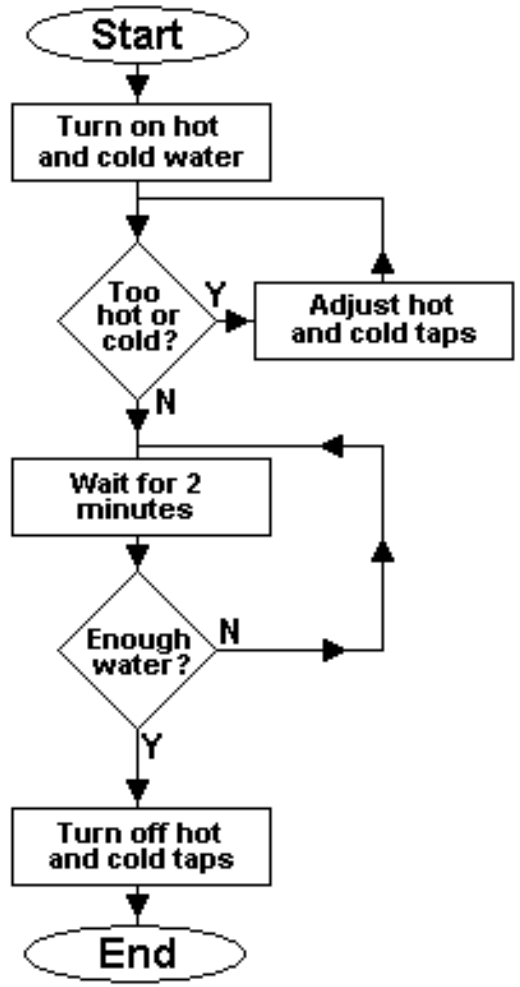
Flow Chart Example 2

The step *Fill the bath with water* in the previous example could have been more detailed. For example, you need to check if there is enough water and whether it is at the right temperature while running the bath.

Again we need to think about the steps involved:
(1) Turn on the hot and cold taps.
(2) Is it too hot or cold? If it is, go to step 3, otherwise go to step 4.
(3) Adjust the hot and cold taps and go back to step 2.
(4) Wait for 2 minutes.
(5) Is the bath full? If it is, go to step 7, otherwise go to step 6.
(6) Go back to step 4.
(7) Turn off the hot and cold taps.

Now we need to draw the chart. This time we need to use decision boxes for steps 2 (where the temperature of the water is checked) and 5 (where it is checked if the bath is full).

The final chart is shown on the right.

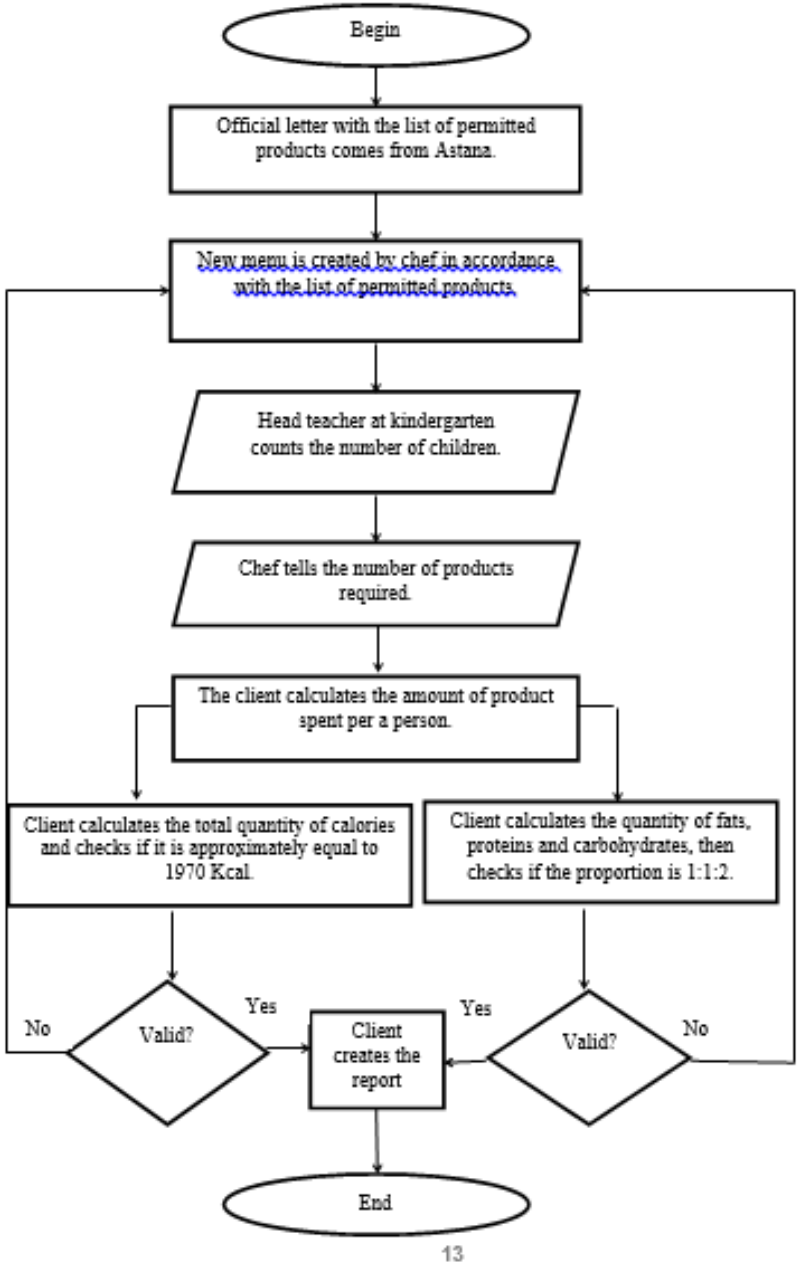


Exercises

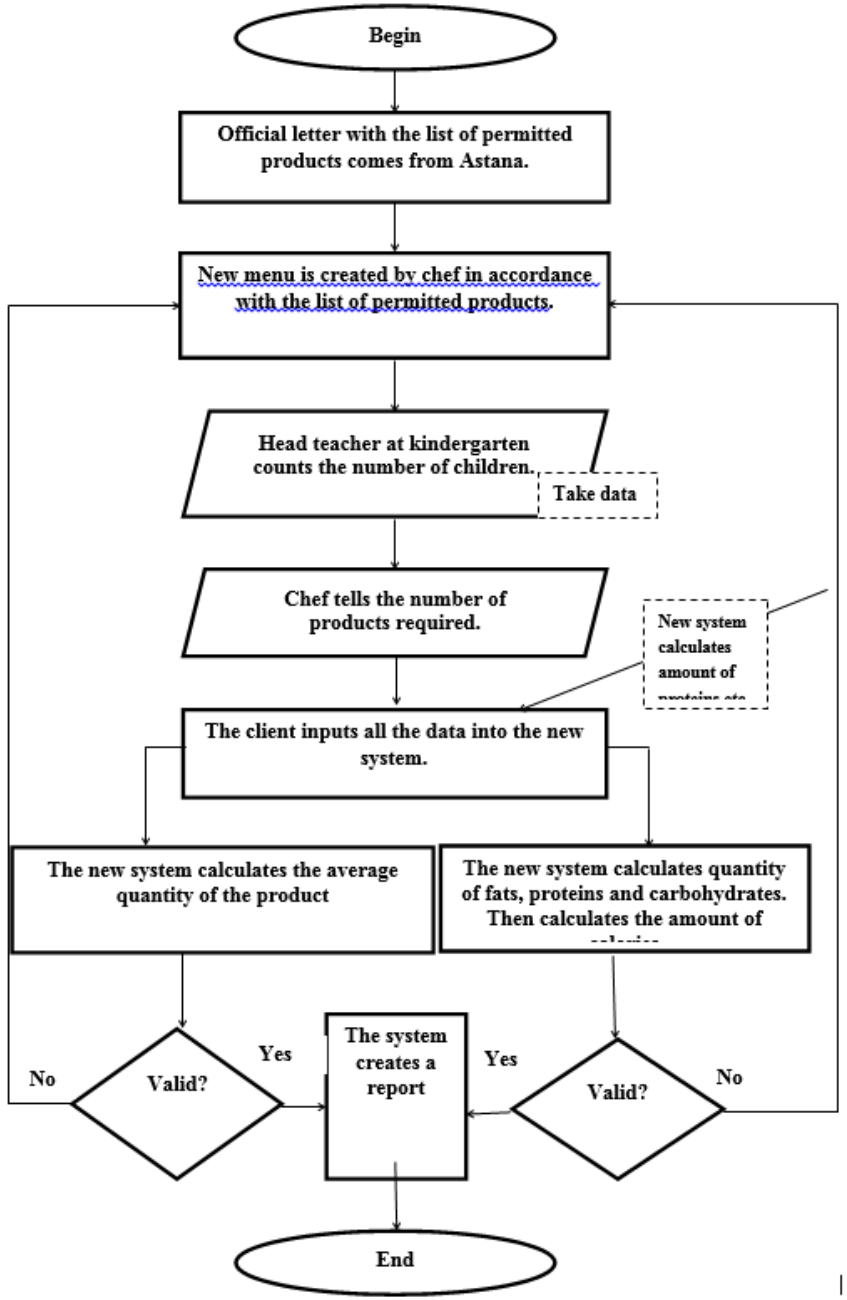
- Open the link
- Answer to the question

https://www.cimt.org.uk/projects/mepres/book8/bk8i1/bk8_1i2.htm

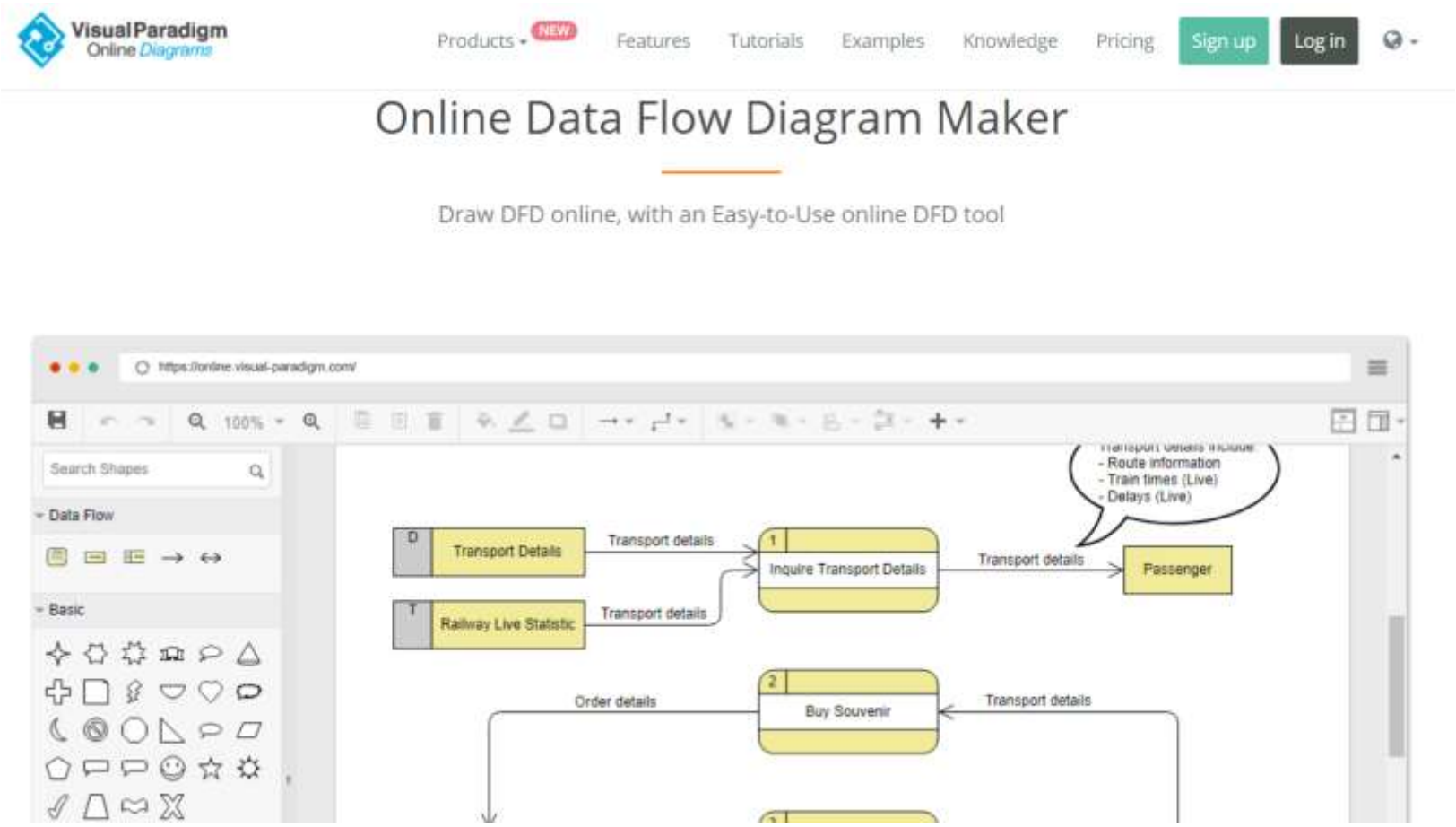
Flow chart of the current paper-based system



Flow chart for the new system

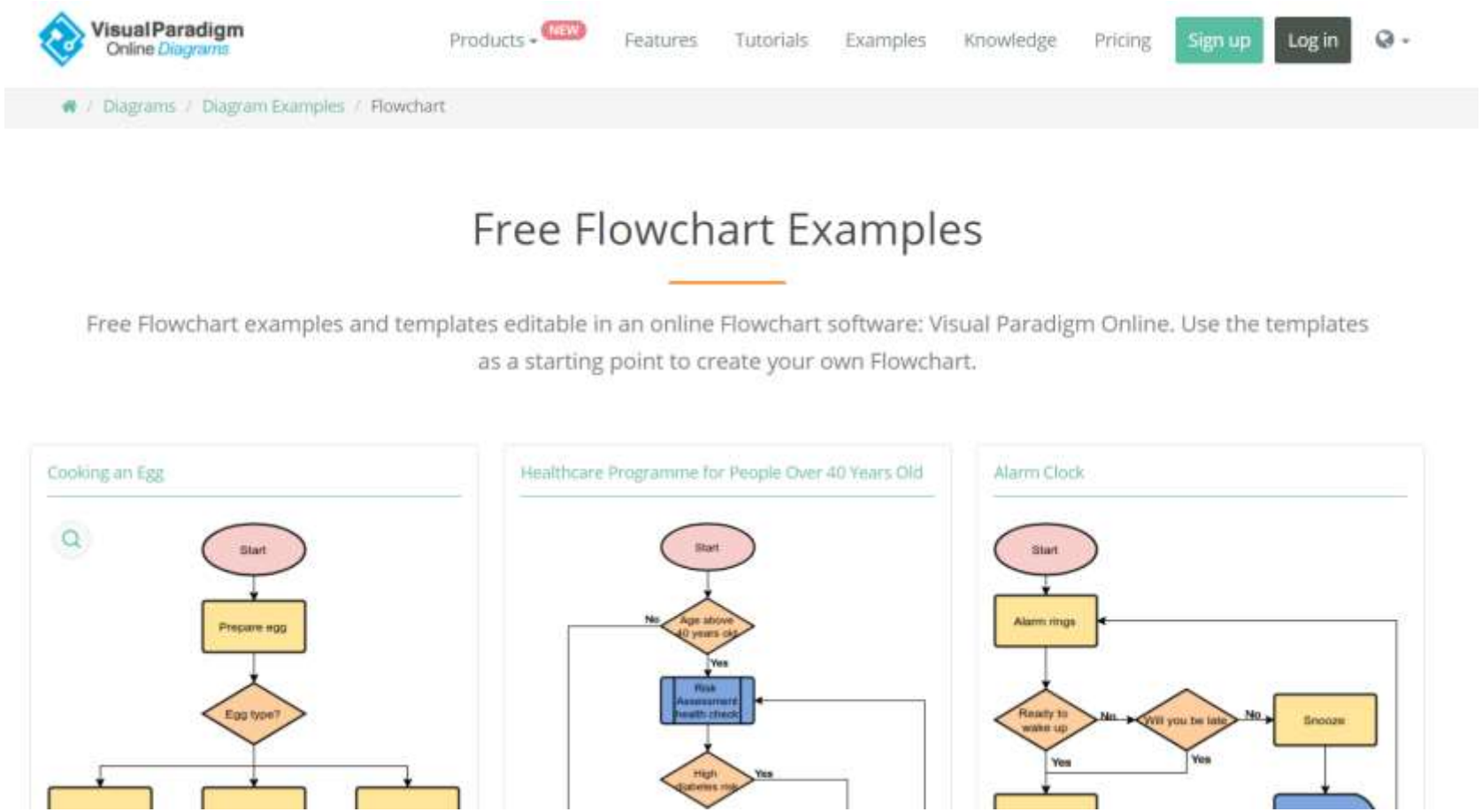


DFD Maker



https://online.visual-paradigm.com/diagrams/features/dfd-maker/

Flowchart Maker



https://online.visual-paradigm.com/diagrams/examples/flowchart/

Formative Assessment 1 – Create DFD using
https://online.visual-paradigm.com/w/imqgxvmb/diagrams/#diagram:proj=0&type=DataFlowDiagram&width=11&height=8.5&unit=inch

Consider the Scenario below

World's Trend is a mail order supplier of high-quality, fashionable clothing. Customers place orders by telephone, by mailing an order form included with each catalog, or via the Web site.

Summary of Business Activities

- When customer orders come in, the item master and the customer master files are both updated. If an item is out of stock, the inventory control department is notified.
- If the order is from a new customer, a new record is created in the customer master file.
- Picking slips are produced for the customer order and sent to the warehouse.
- A shipping statement is prepared.
- The process of shipping a customer order involves getting the goods from the warehouse and matching up the customer shipping statement, getting the correct customer address, and shipping it all to the customer.
- The customer statement is generated and a billing statement is sent to a customer once a month.
- An accounts receivable report is sent to the accounting department.

Formative Assessment 2 – Create Flowchart using

https://online.visual-paradigm.com/diagrams/examples/flowchart/

Consider the Scenario below

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Extra Task

Exam questions:

Question. A computer is used to control the temperature of liquid entering a manufacturing process. A heater is turned on if the liquid is too cold. The operator has first to set the correct temperature. On a separate piece of paper, draw a flowchart to show how the computer would operate this system. (Marks: 5)

- input temperature (input box)
- detect temperature (input box)
- check temperature against input value(process box)
- is temperature too low?(decision box)
- 'Yes' and 'No' exits from decosion box
- 'Yes' leads to 'turn heater on'
- 'No' loops back to 'detect temperature'
    - any five of these points