

FACTFILE: GCE DIGITAL TECHNOLOGY

AS1: APPROACHES TO SYSTEMS DEVELOPMENT: PROGRAMMING



Program Structure 3 – Using Flowcharts

Learning Outcomes

Students should be able to:

- describe how algorithms can be represented using flowcharts.

What is a flowchart





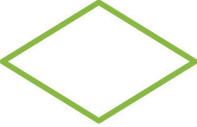


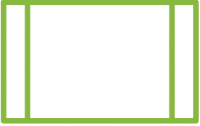

From Program Structure 1: *An algorithm is a set of rules or steps that represent the solution to a problem. The algorithm is used to help design a solution to a given problem and the order of the steps is important.*

A flowchart is a diagrammatic representation of an algorithm. It represents the flow of control and the actions required.



Flowchart Symbols

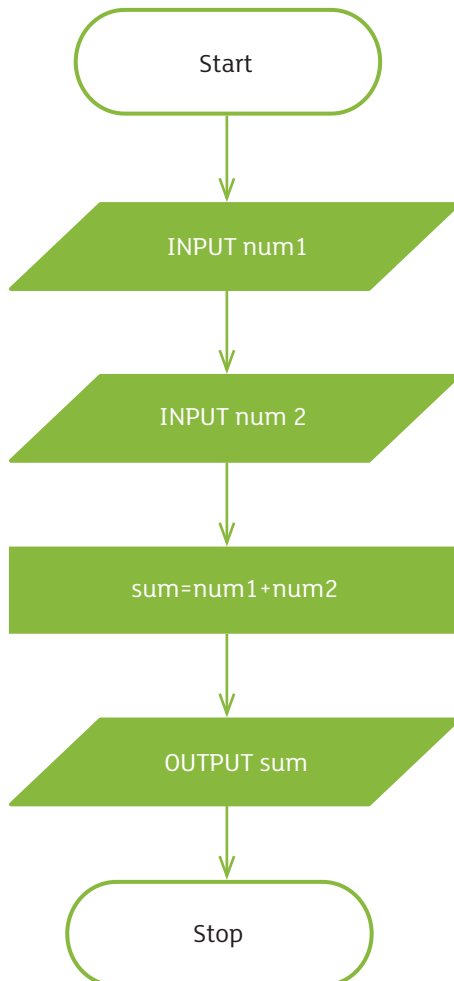
Some typical flowchart symbols are shown below:

| Symbol | Purpose | Description |
|---|----------------------|--|
|  | Flow line | The flow line is used to indicate the flow of logic by connecting the different symbols together. |
|  | Terminal(Stop/Start) | This symbol is used to represent the start and end of the flowchart. |
|  | Input/Output | This symbol is used to indicate input or output of data. |
|  | Process | This symbol indicates that a process, task, action, or operation is to be done. The text in the rectangle almost always includes a verb. |
|  | Decision | A decision box asks a question and a pathway is selected based on the outcome of the question asked. There are two alternatives Yes or No. |
|  | On-page Connector | To connect to another section of the chart a circle can be used. Draw the line to the circle and label the circle with a letter. Place a copy of the circle where you want the flow to continue. |
|  | Off-page Connector | Can be used to connect a flowchart section on different page. However, the circle is now often used for both |
|  | Predefined Process | Used to represent a group of statements performing one processing task. |
|  | Document/Report | This symbol indicates that a report or document is used or produced. |

Using Flowcharts

Here is a flowchart which represents a solution for adding two numbers together.

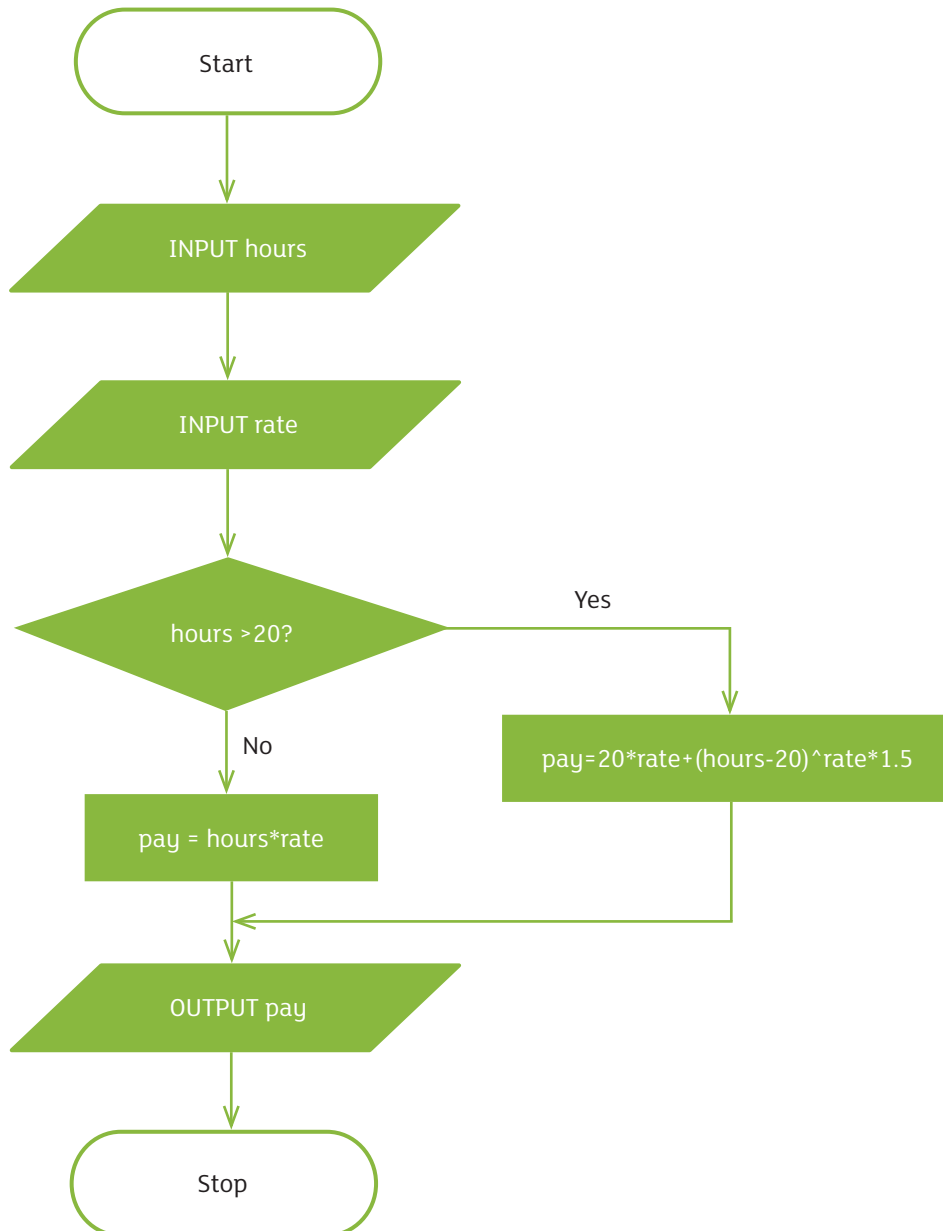
Problem: Input two numbers, calculate and output their sum.



Note

A flowchart should be as programming language independent as possible.
READ or GET, for example, could be used instead of INPUT.
WRITE or PUT, for example, could be used instead of OUTPUT.

Problem: A program is required to calculate the weekly pay for an employee. If the employee works more than 20 hours, overtime is paid at time and a half.



Problem: A program is required to calculate and output the average of 10 numbers input by the user.

