S3_1

Flowchart - Tutorial

Algorithms & Flowcharts - recap

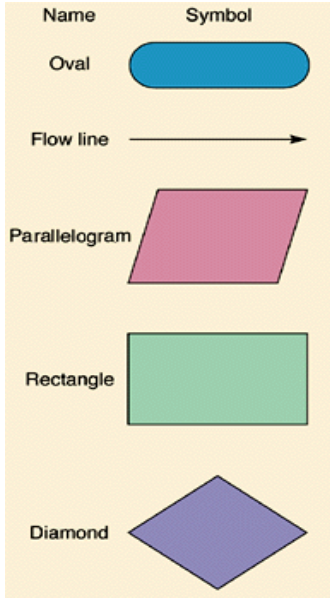
- **Algorithm**
- step by step procedure
  - ✓Finiteness
  - ✓Definiteness
  - ✓Input
  - ✓Output
  - ✓Effectiveness

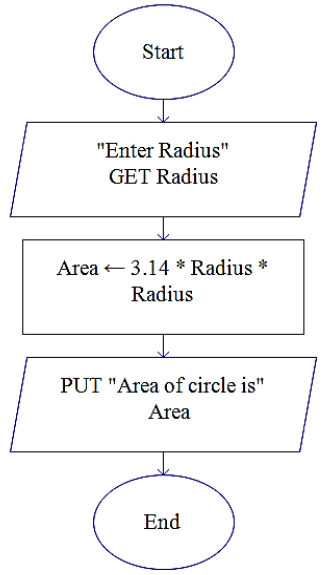
Algorithmic Notations

- **Name of the algorithm** [*mandatory*]
  [*gives a meaningful name*]
- **Start** [*Begin of algorithm*]
- **Step Number** [*mandatory*]
  [*indicate each individual simple task*]
- **Explanatory comment** [*optional*]
  [*gives an explanation for each step, if needed*]
- **Termination** [*mandatory*]
  [*tells the end of algorithm*]

Name of the algorithm : **area of a circle**
Step1: **Start**
Step 2: **Input radius**
Step 3: [*Compute the area*]
Area ← 3.1416 * radius * radius
Step 4: [*Print the Area*]
Print 'Area of a circle =', Area
Step 5: [*End of algorithm*]
Stop

- **Flowchart**
- pictorial representation of computation
  - ✓Easier to understand and analyze
  - ✓Machine independent
  - ✓ Well suited for any type of logic





Learning objectives!!!

To learn and appreciate the following concepts

- ✓ Draw flowcharts for simple problems
- ✓ Run and check output in RAPTOR tool

Learning Outcomes

At the end of session the student will be able to

- ✓Draw the flowcharts for simple problems
- ✓ Use the RAPTOR tool to write, run and check the output of flowchart

Celsius 2 Fahrenheit– Algorithm to Flowchart

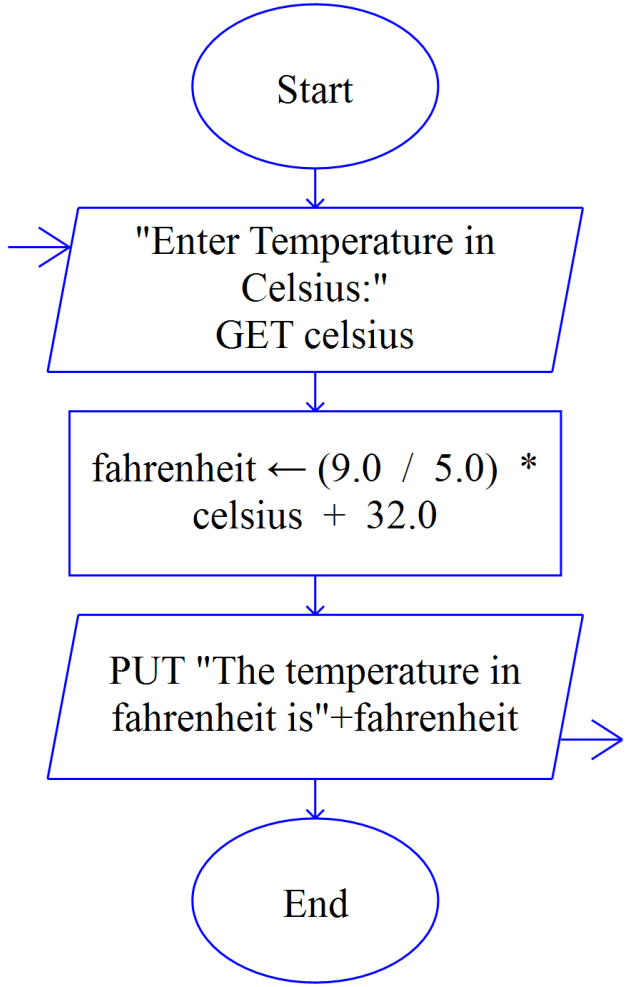
Name of the algorithm: **Celsius 2 Fahrenheit**

Step1: **Input celsius**

Step 2: [Compute the Fahrenheit]
fahrenheit ← celsius * (9/5) + 32

Step 3: [Print the Fahrenheit]
Print 'Temp in Fahrenheit is =', fahrenheit

Step 4: [End of algorithm]
Stop



Let's draw a flowchart to add two numbers!!

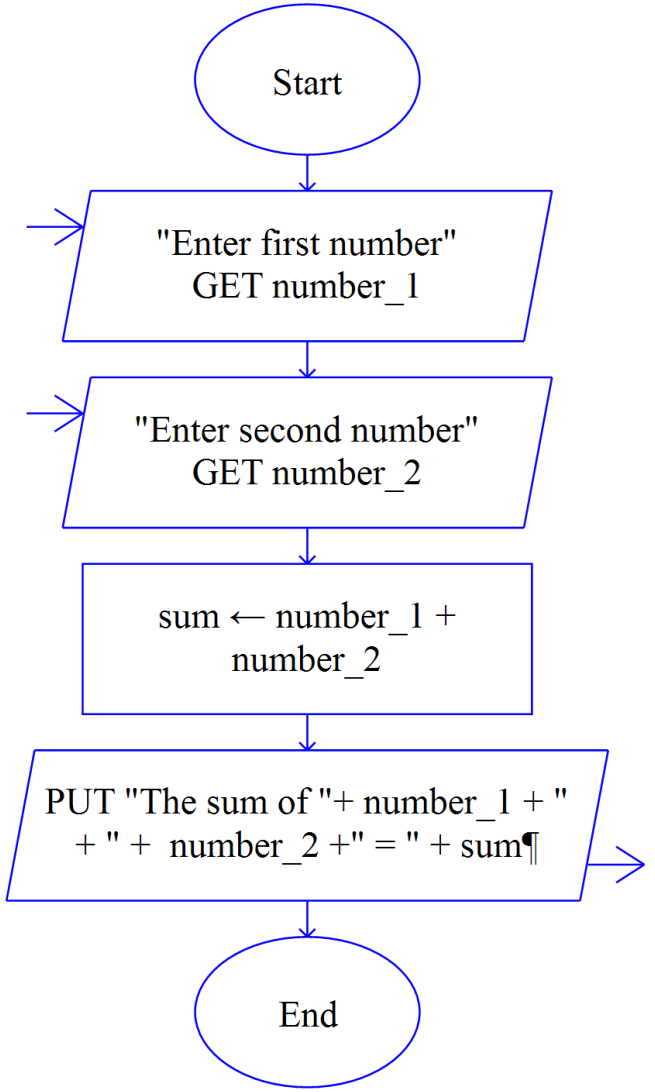
Name of the algorithm: **Compute the sum of 2 numbers**

Step1: **Input numer_1, number_2**

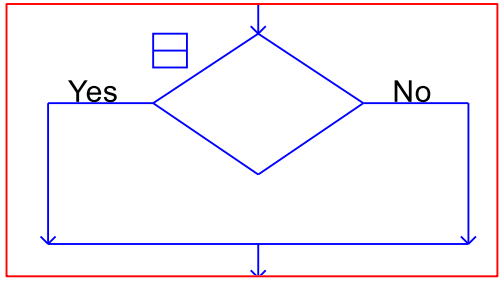
Step 2: [Compute the sum]
sum ← number_1 + number_2

Step 3: [Print the sum]
Print 'Sum of number_1 + number_2 =', sum

Step 4: [End of algorithm]
Stop



Learn to use **selection control** through an example!



Name of the algorithm: **Largest of 2 numbers**

Step 1: **Start**

Step 2: **Input A, B**

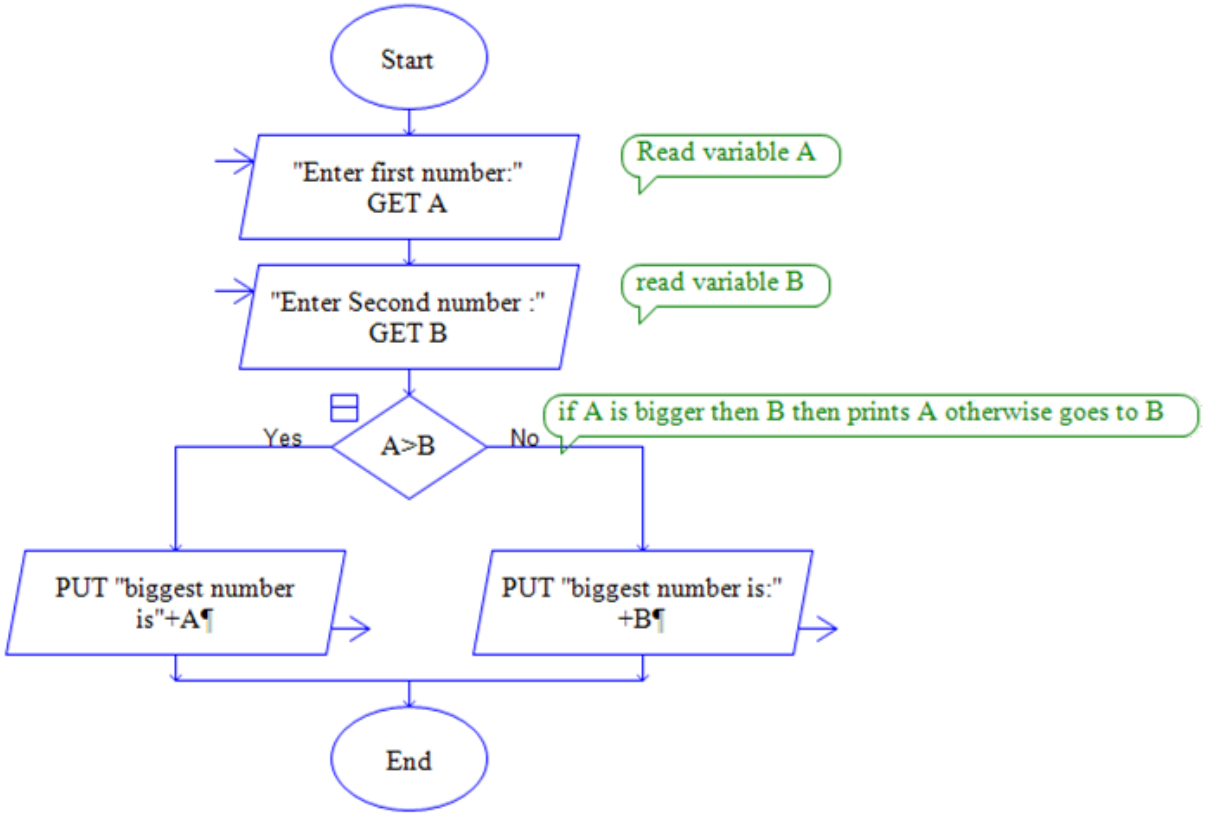
Step 3: **if A > B then**

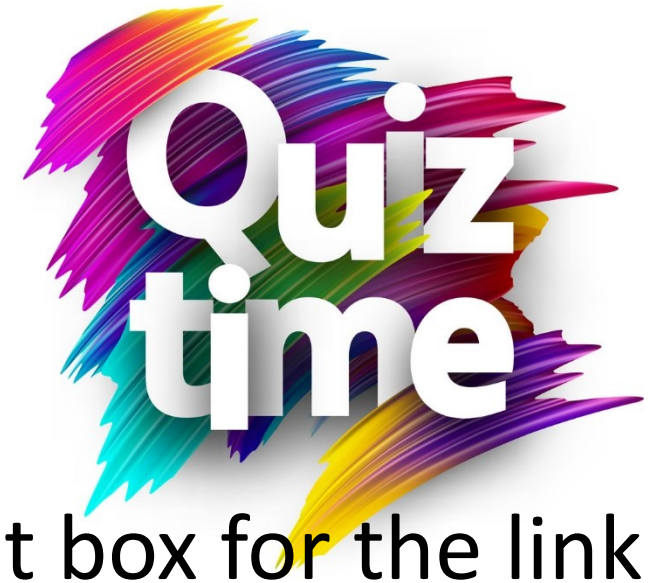
Print A is bigger

else

Print B is bigger

Step 4: **Stop**





Go to posts/chat box for the link to the question

submit your solution in next 2 minutes

The session will resume in 3 minutes

Let us have some **hands-on** to draw a flowchart in RAPTOR

Name of the algorithm: **Find the largest of 3 numbers**

Step 1: **Start**

Step 2: [Read the values of A, B and C]
Read A, B, C

Step 3: [Compare A and B]
if A > B Go to step 5

Step 4: [Otherwise compare B with C]
if B > C then
Print 'B is largest'
else
Print 'C is largest'
Go to Step 6

Step 5: [Compare A and C for largest]
if A>C then
Print 'A is largest'
else
Print 'C is largest'

Step 6: [End of the algorithm]
Stop

Write an algo. & draw a flowchart for **Time**

Name of the algorithm: **Convert Time in seconds to Hours, Minutes and Seconds**

Step 1: **Start**

Step 2: [Read the Time in seconds]

Read sec

Step 3: [Computation]

hours← secs /3600

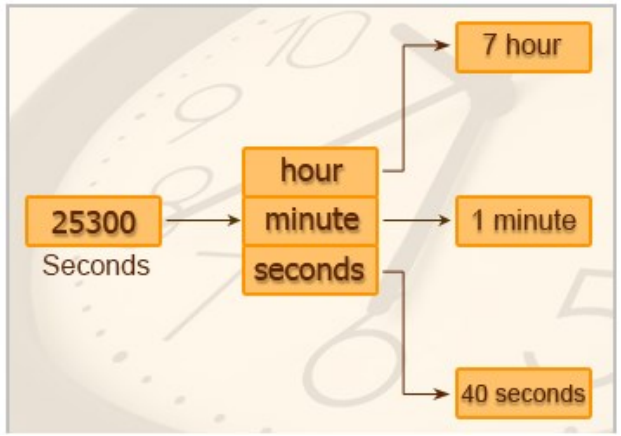
mins←(secs MOD 3600)/60

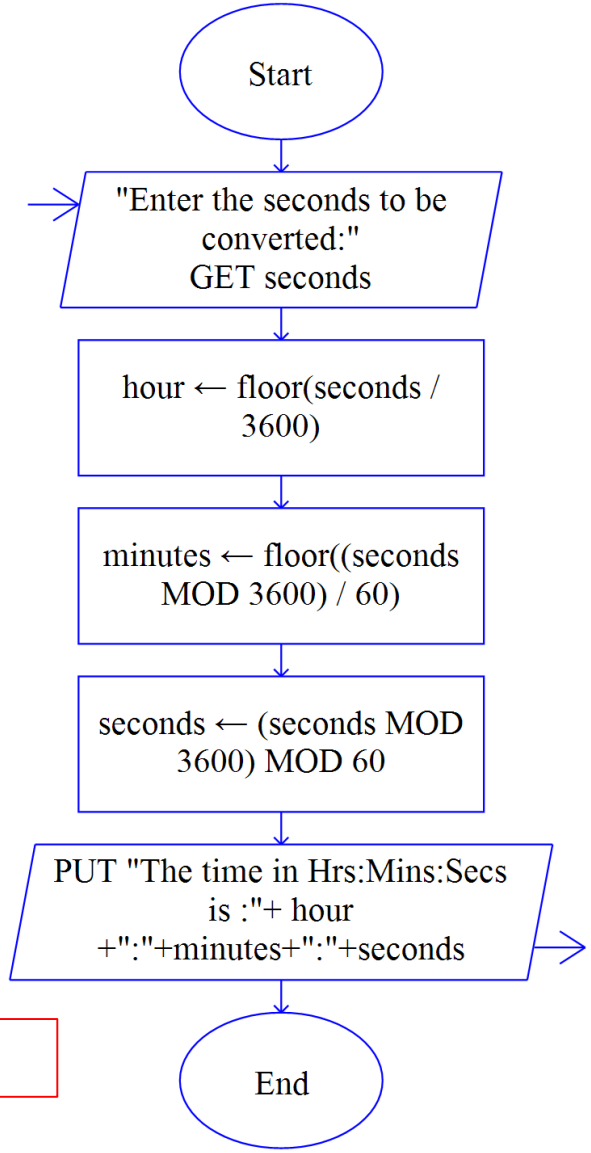
secs ← (secs MOD 3600) MOD 60

Step 4: [Print the Time in Hr: Min: Sec]

Print 'Time in Hr:Min:Sec =', hours: mins : secs

Step 5: **Stop**

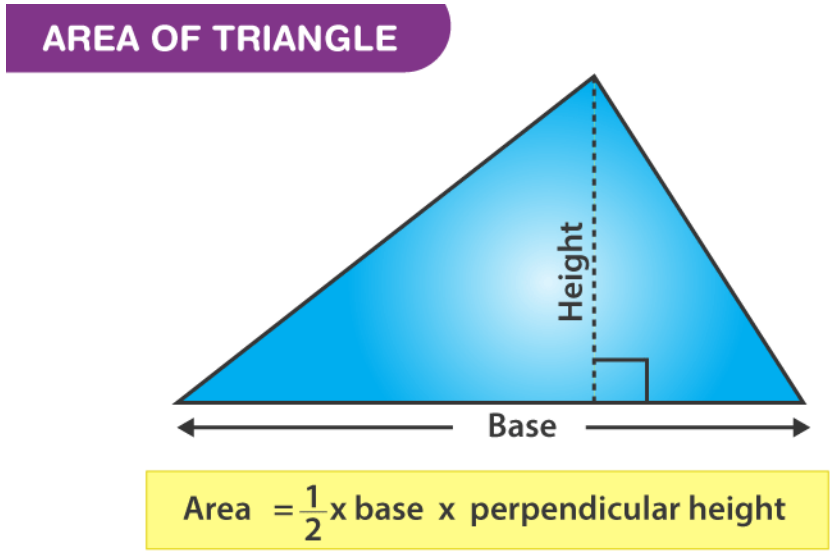




MOD Modulo operator gives the reminder from an integer division

Tutorial Questions

- Write the algorithm and draw the flowchart to find the area of triangle when three sides are given using RAPTOR tool
- Write the algorithm and draw the flowchart to check whether given integer is positive or negative using RAPTOR tool



Summary

- ✓Flowcharts for simple problems
- ✓ How to use RAPTOR tool

Largest of 3 numbers