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DEPARTMENT OF AIML

OBLEM SOLVING AND C PROGRAMMING

I YEAR - I SEM

T 1 – Introduction to Problem Solving Techniques

TOPIC 4 – Building Blocks of Algorithm

d as a sequence of instructions that describe a solving a problem.

rds it is a step by step procedure for solving a

e written in simple English

d every instruction should be precise and uous.

ons in an algorithm should not be repeated

m should conclude after a finite number of

ave an end point

results should be obtained only after the terminates.

Problem: Ad

Step 1: St
Step 2: Re
Step 3: C=
Step 4: Pr
Step 5: St

Example: W
add

- Start
- Step 1: Get nu
- Step 2: Get nu
- Step 3: Sum
- Step 4: Displa
- Stop

wing are the primary factors that are often used to judge th
.
execute a program, the computer system takes some amount of ti
quired, the better is the algorithm.
- To execute a program, computer system takes some amount o
is the memory required, the better is the algorithm.
– Multiple algorithms may provide suitable or correct solutions to
hese may **provide more** accurate results than others, and such al

Example
Write an algorithm to print „Good Morning”
Step 1: Start
Step 2: Print “Good Morning”
Step 3: Stop

gorithm is a part of the blue-print or pla
uter program.
gorithm is constructed using following block
- Statements
- States
- Control flow
- Function

re **simple sentences** written in algorithm for
se.
may consists of assignment statements,
statements, comment statements

ght include some of the following actions
information given to the program
ta-perform operation on a given input
a - processed result

value of ‘a’ //This is input statement
c=a+b //This is assignment statement
value of c // This is output statement
statements are given after // symbol, which is
the purpose of the line.

Problem: Add two

Step 1: Start
Step 2: Read A, B
Step 3: C=A+B
Step 4: Print C
Step 5: Stop

thm is deterministic **automation** for accomplishing a goal whi
nitial state, will terminate in a defined end-state.
words, **Transition from one process to another process** un
ondition with in a time is called state.
hm will definitely have **start state and end state**

Problem: Add two numbers

Step 1: Start
Step 2: Read A, B
Step 3: C=A+B
Step 4: Print C
Step 5: Stop

flow which is also stated as flow of control, deter
of code is to run in program at a given time.

re three types of flows, they are
quential control flow
ection or Conditional control flow
pping, iteration or repetition control flow

al control structure is used to perform the **action one after**
step is executed once.
is **top to bottom** approach.

ion: To find the sum of two numbers.

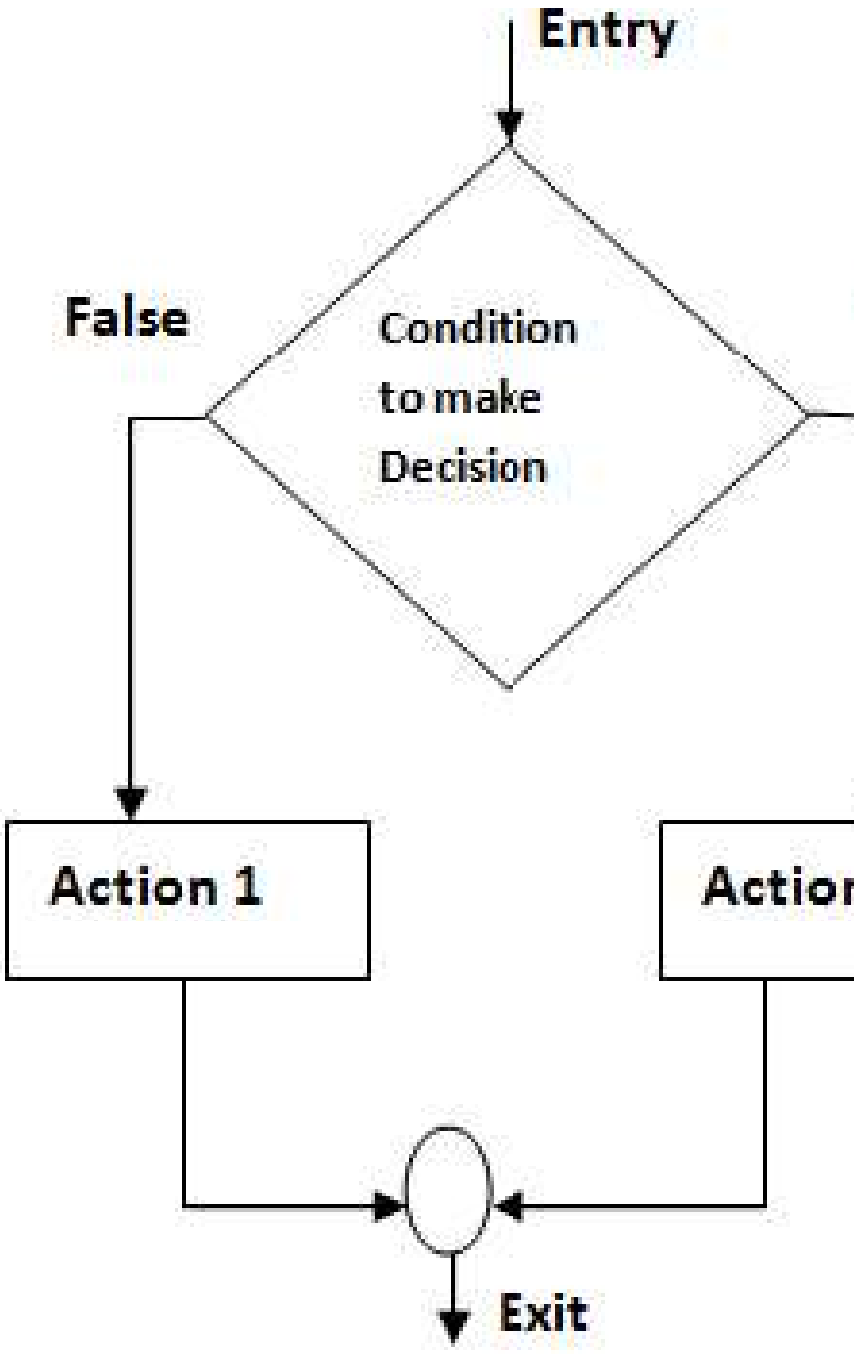
1. Start
2. Read the value of ‘a’
3. Read the value of ‘b’
4. Calculate sum=a+b
5. Print the sum of two number
6. Stop

v allows the program to make **“choice” between two alternate paths** based on conditio
d as **decision structure.**

is **TRUE** then
some action
ITION is **FALSE** then
some action

nding the greater number

hen
. Print a is greater
se
. Print b is greater



ntrol flow means that **one or more steps are performed repeatedly** until some **conditi**
used for producing **“loops”** in program logic when one or more instructions may need to
depending on condition.

NDITIONis true
nts

print the values from 1 to n

e value of ‘n’
ze i as 1
step 4.1 until i< n
. Print i

a **block** of organized, reusable code
perform a single, related action.
o named as methods, sub-routines.
roblems, the problem is been divided
nd simpler tasks during algorithm

Functions
on in line of code
use
adability
ion hiding
debug and test
d maintainability

name(parameters)
action statements
on

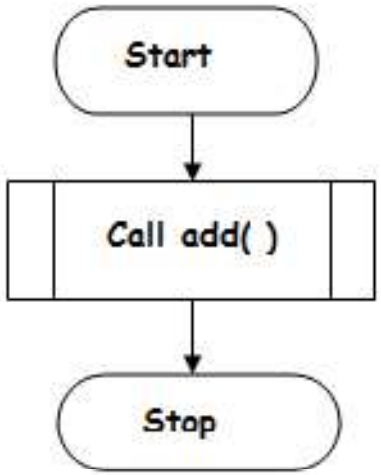
Algorithm for addition of two numbers usin

Main function()

Step 1: Start
Step 2: Call the function add()
Step 3: Stop

sub function add()

Step 1: Function start
Step 2: Get a,bValues
Step 3: add c=a+b
Step 4: Print c
Step 5: Stop



ircle of radius r.

algorithm:

s r of the Circle.

put:

f the Circle

he Radius r of the Circle

*r // calculation of area

Problem2:

Write an algorithm to read two numbers

Inputs to the algorithm:

First num1.

Second num2.

Expected output:

Sum of the two numbers.

Algorithm:

Step 1: Start

Step 2: Read\input the first num1.

Step 3: Read\input the second num2.

Step 4: Sum = num1+num2 // calculatio

Step 5: Print Sum

Step 6: Stop

e Fahrenheit to Celsius
algorithm:
rature in Fahrenheit
put:
rature in Celsius

erature in Fahrenheit F
32)
erature in Celsius: C

Problem 4:

Find the largest number between A and B

Inputs to the algorithm:

A, B

Expected output:

Largest A or B

Algorithm:

Step 1: Start

Step 2:Read A, B

Step 3: If A is less than B, then

Big=B

Small=A

Print A is largest

Else

Big=A

Small = B

Step 4: Write (Display) BIG, SMALL

ent's average grade and
ccessful or fail.

erm and final
id-term + final)/2
< 60) then
FAIL"

SUCCESS"

Problem 6:

A algorithm to find the largest value of any

Step 1: Start
Step 2: Read/input A,B and C
Step 3: If (A>=B) and (A>=C) then Max=A
Step 4: If (B>=A) and (B>=C) then Max=B
Step 5:If (C>=A) and (C>=B) then Max=C
Step 6: Print Max
Step 7: End