

- Int

Output

- Sum of the first n prime numbers (int)

7. An algorithm which calculates the sum of the first 107 prime numbers

Inputs

- nothing

Output

- Sum

Example precondition: array input is not null

Binary Search

Pre: array is sorted. (& not null)

Post: output is true if and only if integer is in array

2. Cleaning your teeth

Precondition

- Teeth exist

Post-condition

- Teeth are clean

3.

Precondition

- Array is not null and array is sortable

Post-condition

- The array is sorted

4.

Precondition

- They exist and are available

Post-condition

- Meal is edible

5.

Precondition

- Board is in legal configuration
- There is possible move to make

Post-condition

- The move is legal

6.

Precondition

- N is an integer greater than 1

Post-condition

- The output is actually the output

21/02/17

Wake up at 10:00 am

Run washing machine at 10:10 am

Stack dishwasher at 10:15 am

Run dishwasher at 10:20 am

Watch Maths lecture and do tutorial questions sheet at 10:25 am

Hang out clothes at 10:50 am

Unstack dishwasher at 11:00 am

Wash wooden spoons and cutting boards at 11:05 am

SUMOFSQUARES=0

Preview from Notesale.co.uk
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Name
Gender
Age /DOB
Username
Password
Interests
Appearance[]
Hobbies

THESE ARE ALL ABSTRACTIONS

12/07/16

Problem: Given an array of Strings (of length 'n'), find out if there are two strings which are the same.

check = false

loop i from 0 to n-2 <- worse case n-1 times

 loop j from i+1 to n-1 <- worst case n-1 times

 if NAMES[i] = NAMES[j] <- this gets done $\leq (n-1)^2$ times ($n^2 - 2n + 1$)

 check = true;

 end if

 end loop

end loop

output check

Given a sorted array S of integers, find whether a value v, in in S

i = 0

loop while i < S.length <- s.length

 if v = S[i] <- happens s.length times in the worst case

 return true

 i = i + 1

end loop

return false

let n be S.length

running time: 3n

running time is proportional to n

Binary search halves search space every step

Binary search. in k steps you could search a 2^{k-1} size array

steps -> size of array

1 - 1

2 - 2

3 - 4

4 - 8

5 - 16

$n = 2^{k-1}$

$\log n = k$

13/07/17

Problem: Write a pseudocode algorithm which takes a sorted array of integers S, and a value v as input and returns true if there are two elements of S which add to v and returns false otherwise.

input v

result = false

loop j from 0 to s.length-1 <- n times

 loop i from j to s.length-1 <- n times

 if s[j] + s[i] = v <- 4

Algorithm C:
SUM = 0
input N = 5
SUM = N * (N+1)/2
output "The Sum is:" +SUM

Flag
FOUND = False
FOUND = True
FOUND = False

4/08/17

A = 10
B = 4
Runs infinite times

A = 4
B = 10
Runs 0 times

A = 10
B = 9
"com" "sci" "ftw"

A = 10
B = 0
Com, ftw

A	B
20	2
19	2
9	2
4	2
	--

8/08/17

4.3.6 -> 4.3.8

Learning Intention: The basic terms of programming including variable, constant, operator and objects and when to use variables vs constants in algorithms

Variable

- An identifier of a memory location to store data in a program.
- The value can be changed during normal execution of the program
- the value is variable.
- Has a name and data type determined at its creation and cannot be changed.

NUM = 5
if NUM < 3
 then output "under 3"
else if NUM == 3
 then output "Equals 3"
else
 then output "Over 3"
end if

4.3 Introduction to programming

4.3 introduction to programming (13 hours)

Nature of programming languages

Use of programming languages

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