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HATFD1025

Find the Second Largest Element in an Array

Write a program to find the second-largest element in an array of integers without using any sorting algorithms or built-in array functions.

Instructions: Traverse the array manually to find both the largest and second-largest elements.

PROGRAM:

```
#!/bin/bash

function find_second_largest() {
    local array=("$@")
    local largest=${array[0]}
    local second_largest=${array[1]}
    local temp

    if [[ ${array[1]} -gt ${array[0]} ]]; then
        temp=$largest
        largest=$second_largest
        second_largest=$temp
    fi

    for i in "${array[@]"; do
        if [[ $i -gt $largest ]]; then
            second_largest=$largest
            largest=$i
        elif [[ $i -gt $second_largest && $i -ne $largest ]]; then
            second_largest=$i
        fi
    done

    echo "$second_largest"
}

read -p "Enter numbers separated by spaces: " numbers
array=( $numbers )
second_largest=$(find_second_largest "${array[@]}")

echo "The second largest element is: $second_largest"
```

OUTPUT:

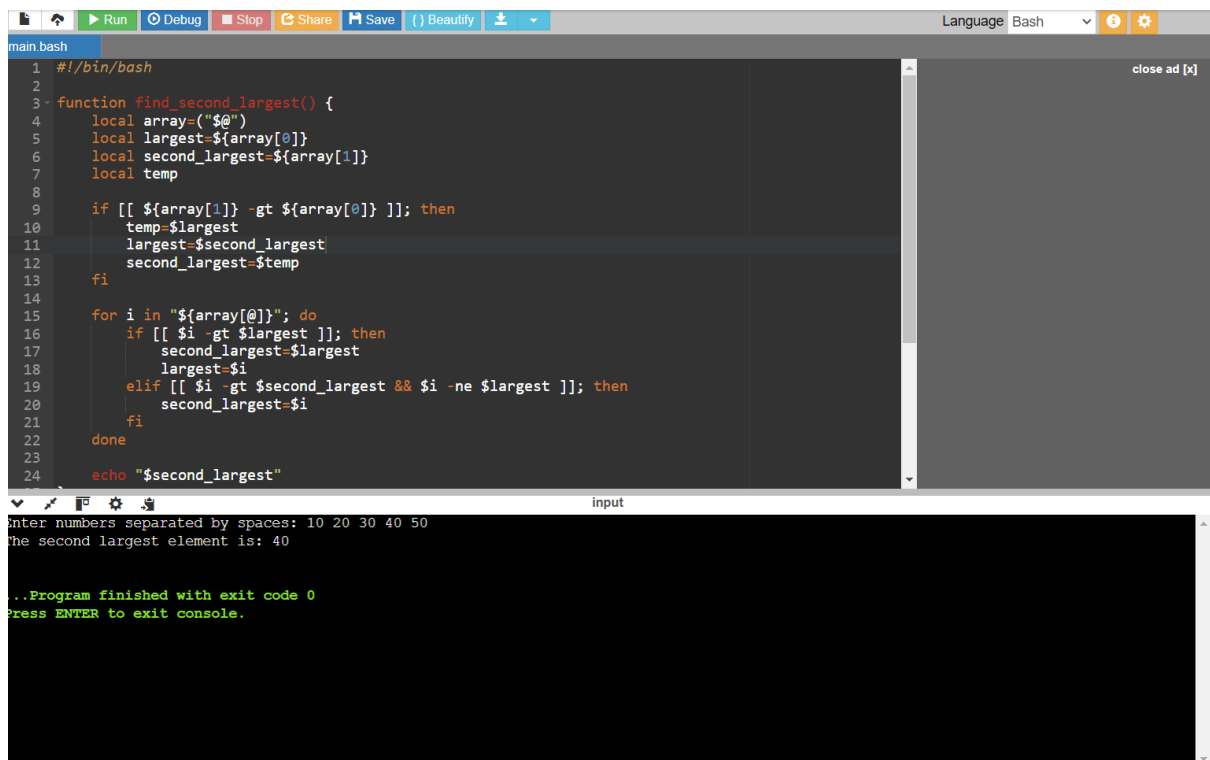
Input 1:

Bash

array=(10 20 30 40 50)

Output 1:

The second largest element is: 40



The screenshot shows a terminal window with a Bash script being executed. The script defines a function `find_second_largest()` that takes an array of numbers and returns the second largest element. The script is run with the input `10 20 30 40 50`, and the output is `The second largest element is: 40`. The terminal window has a title bar with 'main.bash' and a 'Language' dropdown set to 'Bash'. The script code is as follows:

```
1 #!/bin/bash
2
3 function find_second_largest() {
4     local array=("$@")
5     local largest=${array[0]}
6     local second_largest=${array[1]}
7     local temp
8
9     if [[ ${array[1]} -gt ${array[0]} ]]; then
10         temp=$largest
11         largest=$second_largest
12         second_largest=$temp
13     fi
14
15     for i in "${array[@]"; do
16         if [[ $i -gt $largest ]]; then
17             second_largest=$largest
18             largest=$i
19         elif [[ $i -gt $second_largest && $i -ne $largest ]]; then
20             second_largest=$i
21         fi
22     done
23
24     echo "$second_largest"
```

The terminal output shows the script being executed with the input `10 20 30 40 50` and the output `The second largest element is: 40`. The terminal also shows the message `..Program finished with exit code 0` and `Press ENTER to exit console.`

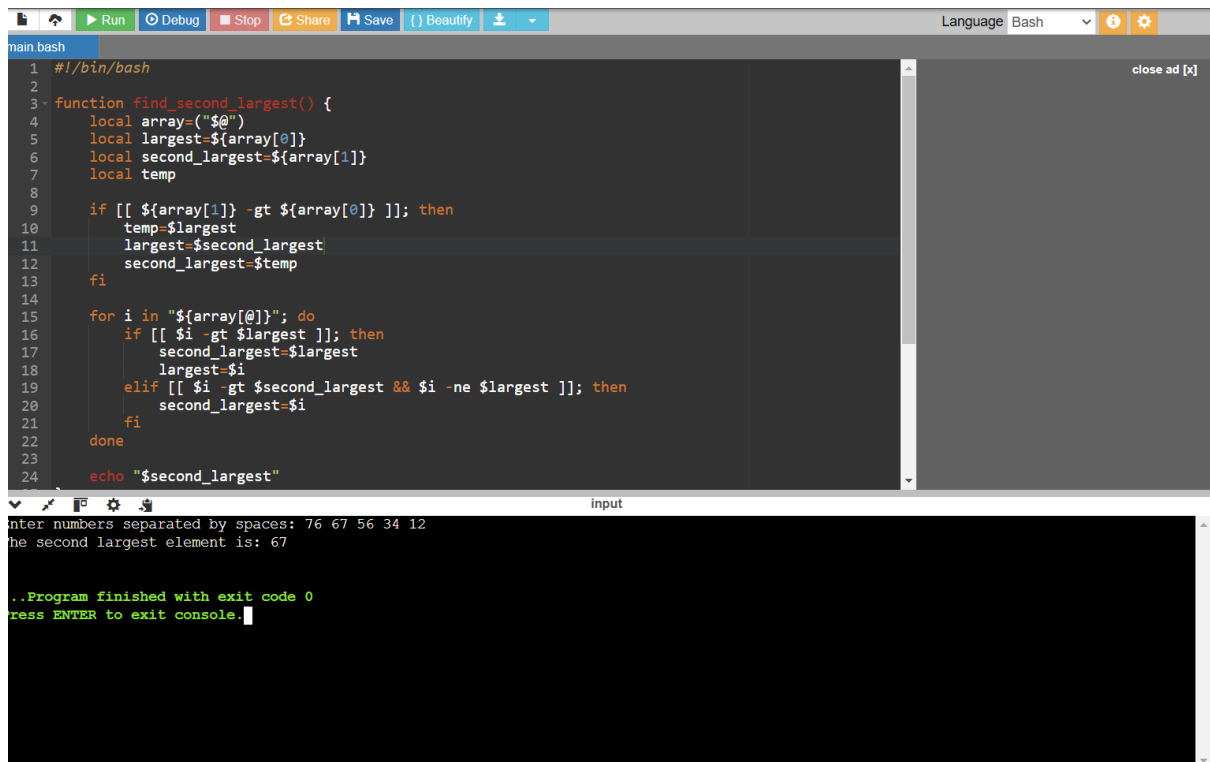
Input 2:

Bash

array=(76 67 56 34 12)

Output 2:

The second largest element is: 76



```
1 #!/bin/bash
2
3 function find_second_largest() {
4     local array=("$@")
5     local largest=${array[0]}
6     local second_largest=${array[1]}
7     local temp
8
9     if [[ ${array[1]} -gt ${array[0]} ]]; then
10         temp=$largest
11         largest=$second_largest
12         second_largest=$temp
13     fi
14
15     for i in "${array[@]"; do
16         if [[ $i -gt $largest ]]; then
17             second_largest=$largest
18             largest=$i
19         elif [[ $i -gt $second_largest && $i -ne $largest ]]; then
20             second_largest=$i
21         fi
22     done
23
24     echo "$second_largest"
25 }
```

enter numbers separated by spaces: 76 67 56 34 12
The second largest element is: 67

..Program finished with exit code 0
Press ENTER to exit console.

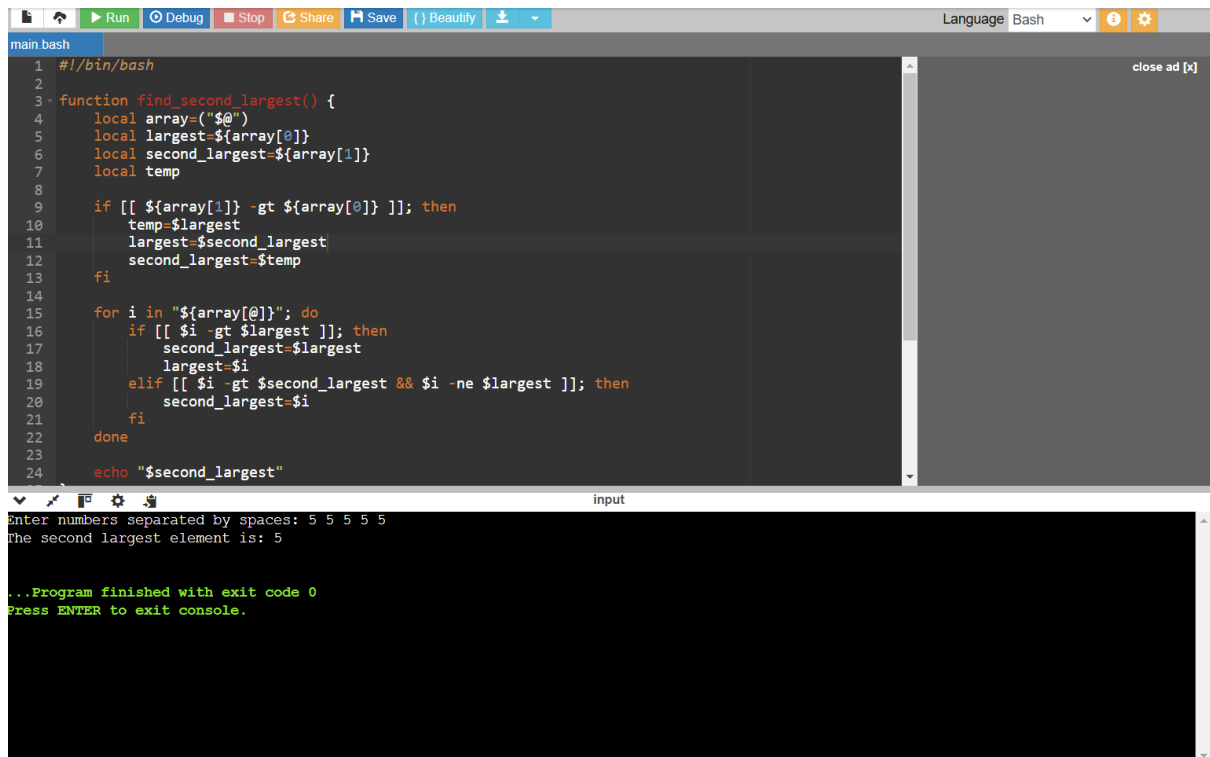
Input 3:

Bash

array=(5 5 5 5 5)

Output 3:

The second largest element is: 5



```
main bash
1  #!/bin/bash
2
3  function find_second_largest() {
4      local array=("$@")
5      local largest=${array[0]}
6      local second_largest=${array[1]}
7      local temp
8
9      if [[ ${array[1]} -gt ${array[0]} ]]; then
10         temp=$largest
11         largest=$second_largest
12         second_largest=$temp
13     fi
14
15     for i in "${array[@]"; do
16         if [[ $i -gt $largest ]]; then
17             second_largest=$largest
18             largest=$i
19         elif [[ $i -gt $second_largest && $i -ne $largest ]]; then
20             second_largest=$i
21         fi
22     done
23
24     echo "$second_largest"
25 }
26
27 find_second_largest 5 5 5 5 5
```

Enter numbers separated by spaces: 5 5 5 5 5
The second largest element is: 5

...Program finished with exit code 0
Press ENTER to exit console.

