

findMax **Mon Oct 04 09:06:38 2021** **1**

Problem: Find the maximum of an array (arr) of integers. arr is of length len.

Pseudo-code:

```
max = arr[0];
for (i = 1; i < len; i++)
    if (arr[i] > max)
        max = arr[i]
```

intermediate pseudo-code:

```
max = arr[0];
i = 1;
(FOR1)
    if (i - len >= 0) jump to ENDFOR1
    if (arr[i] - max <= 0) jump to ENDIF1
    max = arr[i]
(ENDIF1)
    i++
    jump to FOR1
(ENDFOR1)
```

HACK:

```
// max = arr[0];
@arr
D=M
@max
M=D

// i = 1;
@i
M=1

(FOR1)
    // if (i - len >= 0) jump to ENDFOR1
    @i
    D=M
    @len
    D=D-M
    @ENDFOR1
    D;JGE

    // if (arr[i] - max <= 0) jump to ENDIF1
    @arr
    D=A
    @i
    A=D+M
    D=M
    @max
    D=D-M
    @ENDIF1
    D;JLE

    // max = arr[i]
    @arr
    D=A
    @i
    A=D+M
```

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```
D=M  
@max  
M=D
```

```
(ENDIF1)  
// i++  
@i  
M=M+1  
@FOR1  
0;JMP
```

```
(ENDFOR1)
```