

# Unit 9 - Week 7

## Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

- Virtual Machine II - Program flow commands and Introduction to Function Calls
- Implementation of Function Call
- Working of the Virtual Machine
- Project 08: Translation of Program Flow and Function Call to HACK Mnemonic
- Handling Static Variables
- Project 08: Implementation tips in a Nut Shell
- Quiz : Assignment 7**
- Week 7 Feedback

Week 8

Week 9

Week 10

week 11

Week 12

Text Transcripts

Download Videos

## Assignment 7

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

**Due on 2020-03-18, 23:59 IST.**

- 1) Consider the code given below. In this code, the caller function and callee function are, respectively, \_\_\_\_\_ and \_\_\_\_\_ . **1 point**

```
void main()
{a();}
```

- main, a
- a, main
- main, main
- a, a

No, the answer is incorrect. Score: 0

Accepted Answers:  
*main, a*

- 2) The given options contains a few tasks when executing function call commands. Identify the tasks which will be executed when a *function is called*. **2 points**

- Pushing return value onto the stack
- Pushing return address onto the stack
- Popping the pointers LCL, ARG, THIS, THAT
- Pushing the pointers LCL, ARG, THIS, THAT
- Popping the return address from the stack
- Decrementing Stack Pointer to allocate space for local variables

No, the answer is incorrect. Score: 0

Accepted Answers:  
*Pushing return address onto the stack*  
*Pushing the pointers LCL, ARG, THIS, THAT*  
*Decrementing Stack Pointer to allocate space for local variables*

- 3) Which of the following is(are) part of the *frame* of a subroutine, present in the stack? **1 point**

- Arguments
- Local variables
- Instructions of a function present in ROM
- Current working stack in which temporary values are stored.

No, the answer is incorrect. Score: 0

Accepted Answers:  
*Arguments*  
*Local variables*  
*Current working stack in which temporary values are stored.*

- 4) The following list contains tasks done when a function is called. Identify the correct order in which they will be executed. **1 point**

1. allocating stack space for local variables of called subroutine
2. saving caller's frame on the stack
3. Jumping to the callee's code for execution.

- 1,2,3
- 2,1,3
- 2,3,1
- 3,2,1

No, the answer is incorrect. Score: 0

Accepted Answers:  
*2,1,3*

- 5) Identify the C code which best matches the given VM code. **1 point**

```
push c
push b
push a
mul
sub
pop x
```

- a = x \* c - b
- x = c - b \* a
- a = x \* c - b
- x = a \* b - c

No, the answer is incorrect. Score: 0

Accepted Answers:  
*x = a \* b - c*

- 6) *function f n* command denotes the start of function *f*, *call f m* command calls the function *f*. The values **n** and **m** are, respectively **1 point**

- number of arguments, number of locals
- number of goto statements, number of locals
- number of locals, number of arguments
- number of locals, number of goto statements

No, the answer is incorrect. Score: 0

Accepted Answers:  
*number of locals, number of arguments*

- 7) Which of the following VM commands READS EXACTLY ONE value from the stack? **1 point**

- neg
- lt
- add
- mul
- goto
- if-goto

No, the answer is incorrect. Score: 0

Accepted Answers:  
*neg*  
*if-goto*

- 8) When a called function starts execution, what will be the value of ARG? **1 point**

- SP-n-5
- SP-n-4
- SP
- SP-n

No, the answer is incorrect. Score: 0

Accepted Answers:  
*SP-n-5*

- 9) Which of the following statements is CORRECT about static variables? **1 point**

- Unlike local variables, static variables are remembered throughout the program execution.
- They are stored from address 16 till 255 in RAM.
- push static 4** command always writes to address 20 in RAM.
- Static variables across different .vm files, are assigned different addresses in RAM by assembler.

No, the answer is incorrect. Score: 0

Accepted Answers:  
*Unlike local variables, static variables are remembered throughout the program execution.*  
*They are stored from address 16 till 255 in RAM.*  
*Static variables across different .vm files, are assigned different addresses in RAM by assembler.*