ex3:			ex5:			ex3 machinetrace:	
bytecode	micro-C		bytecode	micro-C		[ ]{0: LDARGS}	
LDARGS			LDARGS			[4]{1: CALL 1 5}	
CALL 1, "L1"	call main		CALL (1, "L1")	call main		[4 -999 4]{5: INCSP 1}	
STOP			STOP			[4 -999 4 0]{7: GETBP}	init of i
LABEL "L1"			LABEL "L1"			[4 -999 4 0 2]{8: CSTI 1}	
INCSP 1			INCSP 1			[4 -999 4 0 2 1]{10: ADD}	
GETBP	initiliazation of i		GETBP	initialization of r		[4 -999 4 0 3]{11: CSTI 0}	
CSTI 1			CSTI 1			[4 -999 4 0 3 0]{13: STI}	set i = 0
ADD			ADD			[4 -999 4 0 0]{14: INCSP -1}	
CSTI 0			GETBP			[4 -999 4 0]{16: GOTO 43}	calling while loop
STI	setting i = 0		CSTI 0	setting r = n		[4 -999 4 0]{43: GETBP}	
INCSP -1			ADD			[4 -999 4 0 2]{44: CSTI 1}	loads i
GOTO "L3"			LDI			[4 -999 4 0 2 1]{46: ADD}	
LABEL "L2"			STI			[4 -999 4 0 3]{47: LDI}	
GETBP	print i		INCSP -1			[4 -999 4 0 0]{48: GETBP}	
CSTI 1			INCSP 1			[4 -999 4 0 0 2]{49: CSTI 0}	loads n
ADD			GETBP	nested block		[4 -999 4 0 0 2 0]{51: ADD}	
LDI			CSTI 0	setting up		[4 -999 4 0 0 2]{52: LDI}	
PRINTI			ADD	nested r		[4 -999 4 0 0 4]{53: LT}	condition check
INCSP -1			LDI			[4 -999 4 0 1]{54: IFNZRO 18}	i < n
GETBP			GETBP			[4 -999 4 0]{18: GETBP}	
CSTI 1	increment i by 1		CSTI 2	call square(n, &r)		[4 -999 4 0 2]{19: CSTI 1}	print i
ADD			ADD			[4 -999 4 0 2 1]{21: ADD}	
GETBP			CALL 2 "L2"			[4 -999 4 0 3]{22: LDI}	
CSTI 1			INCSP -1			[4 -999 4 0 0]{23: PRINTI}	
ADD			GETBP			0 [4 -999 4 0 0]{24: INCSP -1}	
LDI			CSTI 2	print nested r		[4 -999 4 0]{26: GETBP}	
CSTI 1			ADD			[4 -999 4 0 2]{27: CSTI 1}	Increments i
ADD			LDI			[4 -999 4 0 2 1]{29: ADD}	
STI			PRINTI			[4 -999 4 0 3]{30: GETBP}	
INCSP -1			INCSP -1			[4 -999 4 0 3 2]{31: CSTI 1}	
INCSP 0			GETBP			[4 -999 4 0 3 2 1]{33: ADD}	
LABEL "L3"	while loop		CSTI 1	print outer r		[4 -999 4 0 3 3]{34: LDI}	
GETBP			ADD	(which is n)		[4 -999 4 0 3 0]{35: CSTI 1}	
CSTI 1			LDI			[4 -999 4 0 3 0 1]{37: ADD}	
ADD			PRINTI			[4 -999 4 0 3 1]{38: STI}	
LDI			INCSP -1			[4 -999 4 1 1]{39: INCSP -1}	
GETBP			INCSP -1			[4 -999 4 1]{41: INCSP 0}	
CSTI 0			RET 0	end program		[4 -999 4 1]{43: GETBP}	calling while loop
ADD			LABEL "L2"			[4 -999 4 1 2]{44: CSTI 1}	(again)
LDI			GETBP	square () loads		[4 -999 4 1 2 1]{46: ADD}	
LT			CSTI 1	i and *rp		[4 -999 4 1 3]{47: LDI}	from now on nothing much
IFNZRO "L2"			ADD			[4 -999 4 1 1]{48: GETBP}	new will happen that we havent covered
INCSP -1			LDI			[4 -999 4 1 1 2]{49: CSTI 0}	in the bytecode, because it is just the while-loop
RET 0	end program		GETBP			[4 -999 4 1 1 2 0]{51: ADD}	running 4 times.
			CSTI 0			[4 -999 4 1 1 2]{52: LDI}	

					ADD				[4 -999 4 1 1 4]{53: LT}				
					LDI				[4 -999 4 1 1]{54: IFNZRO 18}				
					GETBP				[4 -999 4 1]{18: GETBP}				
					CSTI 0	square()			[4 -999 4 1 2]{19: CSTI 1}				
					ADD	calculates i * i			[4 -999 4 1 2 1]{21: ADD}				
					LDI	and stores it in			[4 -999 4 1 3]{22: LDI}				
					MUL	*rp			[4 -999 4 1 1]{23: PRINTI}				
					STI				1 [4 -999 4 1 1]{24: INCSP -1}				
					INCSP -1				[4 -999 4 1]{26: GETBP}				
					INCSP 0				[4 -999 4 1 2]{27: CSTI 1}				
					RET 1				[4 -999 4 1 2 1]{29: ADD}				
									[4 -999 4 1 3]{30: GETBP}				
					the nested scope of ex5 is not				[4 -999 4 1 3 2]{31: CSTI 1}				
					directly visible in the above code				[4 -999 4 1 3 2 1]{33: ADD}				
									[4 -999 4 1 3 3]{34: LDI}				
									[4 -999 4 1 3 1]{35: CSTI 1}				
									[4 -999 4 1 3 1 1]{37: ADD}				
									[4 -999 4 1 3 2]{38: STI}				
									[4 -999 4 2 2]{39: INCSP -1}				
									[4 -999 4 2]{41: INCSP 0}				
									[4 -999 4 2]{43: GETBP}				
									[4 -999 4 2 2]{44: CSTI 1}				
									[4 -999 4 2 2 1]{46: ADD}				
									[4 -999 4 2 3]{47: LDI}				
									[4 -999 4 2 2]{48: GETBP}				
									[4 -999 4 2 2 2]{49: CSTI 0}				
									[4 -999 4 2 2 2 0]{51: ADD}				
									[4 -999 4 2 2 2]{52: LDI}				
									[4 -999 4 2 2 4]{53: LT}				
									[4 -999 4 2 1]{54: IFNZRO 18}				
									[4 -999 4 2]{18: GETBP}				
									[4 -999 4 2 2]{19: CSTI 1}				
									[4 -999 4 2 2 1]{21: ADD}				
									[4 -999 4 2 3]{22: LDI}				
									[4 -999 4 2 2]{23: PRINTI}				
									2 [4 -999 4 2 2]{24: INCSP -1}				
									[4 -999 4 2]{26: GETBP}				
									[4 -999 4 2 2]{27: CSTI 1}				
									[4 -999 4 2 2 1]{29: ADD}				
									[4 -999 4 2 3]{30: GETBP}				
									[4 -999 4 2 3 2]{31: CSTI 1}				
									[4 -999 4 2 3 2 1]{33: ADD}				
									[4 -999 4 2 3 3]{34: LDI}				
									[4 -999 4 2 3 2]{35: CSTI 1}				
									[4 -999 4 2 3 2 1]{37: ADD}				
									[4 -999 4 2 3 3]{38: STI}				
									[4 -999 4 3 3]{39: INCSP -1}				

							[4 -999 4 3]{41: INCSP 0}			
							[4 -999 4 3]{43: GETBP}			
							[4 -999 4 3 2]{44: CSTI 1}			
							[4 -999 4 3 2 1]{46: ADD}			
							[4 -999 4 3 3]{47: LDI}			
							[4 -999 4 3 3]{48: GETBP}			
							[4 -999 4 3 3 2]{49: CSTI 0}			
							[4 -999 4 3 3 2 0]{51: ADD}			
							[4 -999 4 3 3 2]{52: LDI}			
							[4 -999 4 3 3 4]{53: LT}			
							[4 -999 4 3 1]{54: IFNZRO 18}			
							[4 -999 4 3]{18: GETBP}			
							[4 -999 4 3 2]{19: CSTI 1}			
							[4 -999 4 3 2 1]{21: ADD}			
							[4 -999 4 3 3]{22: LDI}			
							[4 -999 4 3 3]{23: PRINTI}			
							3 [4 -999 4 3 3]{24: INCSP -1}			
							[4 -999 4 3]{26: GETBP}			
							[4 -999 4 3 2]{27: CSTI 1}			
							[4 -999 4 3 2 1]{29: ADD}			
							[4 -999 4 3 3]{30: GETBP}			
							[4 -999 4 3 3 2]{31: CSTI 1}			
							[4 -999 4 3 3 2 1]{33: ADD}			
							[4 -999 4 3 3 3]{34: LDI}			
							[4 -999 4 3 3 3]{35: CSTI 1}			
							[4 -999 4 3 3 3 1]{37: ADD}			
							[4 -999 4 3 3 4]{38: STI}			
							[4 -999 4 4 4]{39: INCSP -1}			
							[4 -999 4 4]{41: INCSP 0}			
							[4 -999 4 4]{43: GETBP}			
							[4 -999 4 4 2]{44: CSTI 1}			
							[4 -999 4 4 2 1]{46: ADD}			
							[4 -999 4 4 3]{47: LDI}			
							[4 -999 4 4 4]{48: GETBP}			
							[4 -999 4 4 4 2]{49: CSTI 0}			
							[4 -999 4 4 4 2 0]{51: ADD}			
							[4 -999 4 4 4 2]{52: LDI}			
							[4 -999 4 4 4 4]{53: LT}			
							[4 -999 4 4 0]{54: IFNZRO 18}			
							[4 -999 4 4]{56: INCSP -1}			
							[4 -999 4]{58: RET 0}			
							[4]{4: STOP}			