

Name	Signature	Student Id Nr	Points

### 581305-6 Computer Organization I, miniexam 3, 3.12.2018 (12 p)

Write your answer on this exam paper in the space given. Please notice, that the exam paper is 2-sided.

Follow the recommended subroutine (function) call mechanism. TTK-91 assembly language instructions are: NOP, STORE, LOAD, IN, OUT, ADD, SUB, MUL, DIV, MOD, AND, IR, XOR, SHL, SHR, COMP, JUMP, JNEG, JZER, JPOS, JNNEG, JNZER, JNPOS, JLES, JEQU, JGRE, JNLES, JNEQU, JNGRE, CALL, EXIT, PUSH, POP, PUSHR, POPR, SVC

Integer-valued 50-element array T[50] is defined at main program level.

Integer-valued 2-dimensional array S[10][20] is defined at main program level. It has 10 rows and 20 columns. S is stored row-wise. Integer-valued variables x, i, and j are defined at main program level.

Use the symbolic ttk-91 assembly language for answers in each part.

a) [2 p] Give a code segment that uses a loop to initialize all element values in T to zero (0).

b) [2 p] Give a code segment to implement statement  $x = S[i][j];$

c) [3 p] Give a code segment that uses a loop to initialize all element values in S to zero (0).  
Notice: you can consider S as 1-dimensional (larger) array.

Subroutine `Init(Tbl, n, v)` initializes all elements in `n`-element 1-dimensional array `Tbl` to value `v`. Parameter `Tbl` is a call-by-reference parameter. Parameters `n` and `v` are call-by-value parameters. Parameter `n` is the number of elements in `Tbl` and `v` is the wanted initial value.

d) [1 p] Give a code segment that uses a subroutine `Init` to initialize all element values in `T` to zero (0).

e) [1 p] Give a code segment that uses a subroutine `Init` to initialize all element values in `S` to zero (0).  
Notice: you can consider `S` as 1-dimensional (larger) array.

f) [3 p] Implement subroutine `Init(Tbl, n, v)`.