

Short Exam No. 1 – Solution Key

Exercise 1 (G1):

Given an array of characters **T**, write the function **isPalindrom** that determines whether **T** is a palindrome or not. A palindrome is a sequence of characters that reads the same forward and backward. For example, "radar" and "level" are palindromes, while "hello" is not.

Provide an example of function call.

Solution 1:

```
Function isPalyndrom(t:tab,i:integer):Boolean; .....(0.5)
Begin
If i≥(n-1)div2 Then isPalyndrom ← True.....(1)
Else if t[i] ≠ t[n-1-i] Then isPalyndrom ← False.....(1)
Else isPalyndrom ← isPalyndrom(t,i+1); .....(1)
End;
```

Call example: `isPalyndrom (t,0);`(1)

Solution 2:

```
Function isPalyndrom(t:tab,i,j:integer):Boolean; .....(0.5)
Begin
If i≥j Then isPalyndrom ← True.....(1)
Else if t[i] ≠ t[j] Then isPalyndrom ← False.....(1)
Else isPalyndrom ← isPalyndrom(t,i+1,j-1); .....(1)
End;
```

Call example: `isPalyndrom(t,0,n-1);`(0.5)

Exercise 2 (G2):

Let $\mathbf{T}$ be an array of 6 integers.

Write the recursive function `isSorted` that takes the array $\mathbf{T}$ as input and tests whether its elements are sorted in ascending order, returning true if they are and false otherwise.

Provide an example of function call.

Solution 1:

```
Function isSorted(i:integer,t:tab):Boolean; .....(0.5)
Begin
If i=n-1 Then isSorted ← True .....(1)
Else if t[i]>t[i+1] Then isSorted ← False.....(1)
Else isSorted ← isSorted (i+1,t); .....(1)
End;
```

Call example: `isSorted(0,t)`;(0.5)

Solution 2:

```
Function isSorted(i:integer,t:tab):Boolean; .....(0.5)
Begin
If i=1 Then isSorted ← True .....(1)
Else if t[i-1]>t[i] Then isSorted ← False.....(1)
Else isSorted ← isSorted (i-1,t); .....(1)
End;
```

Call example: `isSorted(0,n-1)`;(1)

Exercise 3 (G3):

Write the recursive function `isPrime` that checks and returns whether a number `n` passed as parameter is prime or not.

Provide an example of function call.

Solution:

```
Function isPrime(n,i:integer):Boolean; .....(0.5)
Begin
If i=n-1 Then isPrime ← True.....(1)
Else if n mod i=0 Then isPrime ← False.....(1)
Else isPrime ← isPrime(n,i+1); .....(1)
End;
```

Call example: `isPrime(n,2)`;(0.5)