University of 08 Mai 1945 – Guelma

Faculty of MISM | **Date: 04/06/2024**
Department of Mathematics | **Duration : 1h30**
First year LMD | **Semester 2**

Resit Exam – Model Answer

Exercise 1: (5.5 pts)

1) **The iterative function `nbMultIt`:** **(2.5 pts)**

0.5	`Function nbMultIt(n:integer):integer;`
0.25	`Var i,nb:integer;`
	`Begin`
0.25	`nb ← 0;`
0.5	`For i ← 1 To n do`
0.75	`If i mod 2 = 0 and i mod 5 ≠ 0 then nb ← nb + 1;`
0.25	`nbMultIt ← nb;`
	`End;`

2) **The recursive function `nbMultRec`:** **(3 pts)**

0.5	`Function nbMultRec(n:integer):integer;`
	`Begin`
0.75	`If n = 0 then productRec ← 0`
1	`Else If i mod 2 = 0 and i mod 5 ≠ 0 then` `nbMultRec ← 1 + nbMultRec(n-1);`
0.75	`Else nbMultRec ← nbMultRec(n-1);`
	`End;`

Exercise 2: (6.5 pts)

The function `sumFromkth`: **(6.5 pts)**

0.75	`Function sumFromKth(L:List,k:integer):integer;`
0.5	`Var p:List;i,s:integer;`
	`Begin`
0.5	`i ← 1;`
0.5	`p ← L;`
0.5	`s ← 0;`
0.5	`While p≠Nil do`
	`Begin`
1.25	`If i≥k then s ← s+p^.val;`
0.75	`p ← p^.next;`
0.75	`i ← i+1;`
	`End;`
0.5	`sumFromKth ← s;`
	`End;`

Exercise 3: **(8 pts)**

1) **The function `average`:** **(4 pts)**

0.25	`Function average(S:Stack):real;`
0.25	`Var S2:Stack;e,nb,s:integer;`
	`Begin`
0.25	`initializeStack(S2);`
0.25	`nb ← 0;`
0.25	`s ← 0;`
0.25	`while isStackEmpty(S)=False Do`
	`Begin`
0.25	`Pop(e,S);`
0.25	`Push(e,S2);`
0.5	`Nb ← nb+1;`
0.5	`s ← s+e;`
	`End;`
0.25	`while isStackEmpty(S2)=False Do`
	`Begin`
0.25	`Pop(e,S2);`
0.25	`Push(e,S);`
	`End;`
0.25	`average ← s/nb;`
	`End;`

2) **The procedure `split`:** **(4 pts)**

0.25	`Procedure split(Var S,S1,S2:Stack);`
0.25	`Var e:integer;avg:real;S3:Stack`
	`Begin`
0.25	`initializeStack(S1);`
0.25	`initializeStack(S2);`
0.5	`avg ← average(S);`
0.25	`While isStackEmpty(S)=False do`
	`Begin`
0.25	`Pop(e,S);`
0.5	`If e<avg then Push(e,S1)`
0.5	`Else Push(e,S2);`
0.25	`Push(e,S3);`
	`End;`
0.25	`While isStackEmpty(S3)=False do`
	`Begin`
0.25	`Pop(e,S3);`
0.25	`Push(e,S);`
	`End;`
	`End;`