

Second written examination of  
**Algoritmos e Estruturas de Dados**

Outubro 26, 2015    Duration: no more than 30 minutes

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Name:

Student number:

5.0 **1:** What is a stack? What operations does it provide?

Answer:

3.0 **2:** Write on the left C++ code that implements the pop function (stack implemented as an array, data items are of type T), using some of the lines of code presented on the right.

{	T pop(void)
	void pop(T v)
	assert(cur_size > 0);
	assert(cur_size < max_size);
	return data[cur_size++];
	return data[cur_size--];
	return data[++cur_size];
	return data[--cur_size];
	data[cur_size++] = v;
}	data[cur_size--] = v;
	data[++cur_size] = v;
	data[--cur_size] = v;

5.0 **3:** What is a queue? What operations does it provide?

Answer:

3.0 **4:** Explain how to increment an index in a circular buffer.

Answer:

4.0 **5:** Write a C function that counts the number of nodes of a linked list that appear before a given node n. The function must return -1 if the node does not belong to the linked list. Use some of the following lines of code.

```
for(int c = 0;head != NULL;head = head->next,c++)
for(int c = 0;head != NULL;head = head->next,c--)
for(int c = 0;head != NULL;head = head->prev,c++)
for(int c = 0;head != NULL;head = head->prev,c--)
if(head == n)
if(head != n)
return c;
return c - 1;
return c + 1;
return -1;
```

Answer:

```
int count_before(node *head,node *n)
{

}

}
```