

Q1 Academic Honesty

1 Point

It is a violation of the Academic Integrity Code to look at any reference material other than your textbook and lecture notes, or to give inappropriate help to someone or to receive unauthorized aid by someone in person or electronically via messaging apps such as WhatsApp. Academic Integrity is expected of all students of Hacettepe University at all times, whether in the presence or absence of members of the faculty. Do NOT sign nor take this exam if you do not agree with the honor code.

Understanding this, I declare I shall not give, use or receive unauthorized aid in this examination.

Signature (Specify your name and surname as your signature)

Mehmet Taha USTA MTUSTA

Q2

80 Points

For dynamically allocated linked lists, we store both the *head* pointer that points to the first node and a *tail* pointer that points to the last inserted node.

Q2.1

10 Points

Consider that the pointer address and an integer have the same storage size. For a given list of elements, the array-based linked list implementation has a smaller storage space compared to the dynamically allocated linked list implementation.

☐ True

☒ False

Q2.2

10 Points

If a list is empty, which of the following statements are true?

☒ head is NULL☒ tail is NULL☒ head == tail☐ head < tail**Q2.3**

10 Points

When a new node is inserted to the head of a linked list, will the head pointer and the tail pointer be changed?

☒ If the list is empty before the insertion, both head and tail will change.☒ If the list is not empty before the insertion, head will change.☐ head will always change, but tail will never change.☐ both head and tail will change.**Q2.4**

20 Points

Suppose `list1` is a dynamically allocated LinkedList. Analyze the following code:

A:

```
while (list1.getSize() > 0)
    list1.removeAt(list1.get(list1.getSize() - 1));
```

B:

```
while (list1.getSize() > 0)
    list1.removeLast();
```

where

`getSize`: returns the number of nodes

`get(i)`: returns the node at the given index position i ($0 \leq i <$

`getSize()`)

`removeAt(i)`: removes the node at the given index position i ($0 \leq i <$
`getSize()`)

`removeLast`: removes the last element

- ☐ Code fragment A runs faster than code fragment B.
- ☒ Code fragment B runs faster than code fragment A.
- ☐ Code fragment A runs as fast as code fragment B.

Q2.5

10 Points

If you have to add or delete the elements anywhere in a list, what data structure should you use?

- ☐ array
- ☒ linked list
- ☐ stack
- ☐ queue

Q2.6

10 Points

Which data structure is appropriate to store customers waiting in line at a clinic for a flu shots?

- ☐ stack
- ☒ queue
- ☐ array
- ☐ linked list

Q2.7

10 Points

Suppose the rule of the party is that the participants who arrive later will leave earlier. Which data structure is appropriate to store the participants?

- ☒ stack
- ☐ queue
- ☐ array
- ☐ linked list

Q3 Stack

19 Points

A stack `S` of integers initially contains the following data:
6(top), 2, 7, 3

The following code is then executed:

```
int x = S.pop();
int y = S.pop();
int z = S.pop();
S.push(x+y);
int w = S.pop();
S.push(w+z);
```

After this code has been executed, what are the contents of the stack?

☐ 8 (top), 10

☐ 10 (top), 8

☒ 15 (top), 3

☐ 10 (top), 8, 6, 3

☐ The stack is empty

Quiz 3

GRADED

STUDENT
MEHMET TAHA USTA

TOTAL POINTS
100 / 100 pts

QUESTION 1

Academic Honesty

1 / 1 pt

QUESTION 2

(no title)

80 / 80 pts

2.1

(no title)

10 / 10 pts

2.2

(no title)

10 / 10 pts

2.3

(no title)

10 / 10 pts

2.4

(no title)

20 / 20 pts

2.5

(no title)

10 / 10 pts

2.6

(no title)

10 / 10 pts

2.7

(no title)

10 / 10 pts

QUESTION 3

Stack

19 / 19 pts