My Courses   /   My courses   /   Algorithms and Data Structures, MSc (Spring 2023)   /   Exercise Quizzes
/   Week 2: Stacks and Queues

Started on	Tuesday, 7 February 2023, 11:20
State	Finished
Completed on	Tuesday, 7 February 2023, 12:22
Time taken	1 hour 2 mins
Marks	12.67/14.00
Grade	**9.05** out of 10.00 (**90%**)

Question **1**

Correct

Mark 1.00 out of 1.00

s is an empty stack of strings. Consider the following operations:

```
s.push("person")
s.push("woman")
s.push("man")
s.push("camera")
s.push("tv")
s.pop()
```

What element is popped?

Select one:

- ○ person
- ○ woman
- ○ man
- ○ camera
- ● tv   ✓

Your answer is correct.

The correct answer is: tv

Question **2**

Correct

Mark 1.00 out of 1.00

q is an empty queue of strings. Consider the following operations on it:

```
q.enqueue("person");
q.enqueue("woman");
q.enqueue("man");
q.enqueue("camera");
q.enqueue("tv");
q.dequeue();
```

What element is dequeued?

Select one:

- ○ person   ✓
- ○ woman
- ○ man
- ○ camera
- ○ tv

Your answer is correct.

The correct answer is: person

Question **3**

Correct

Mark 1.00 out of 1.00

How many elements are left on the stack after the following operations?

```
Stack<Integer> stack = new Stack<Integer>();
stack.push(1);
stack.pop;
stack.push(2);
stack.push(3);
stack.push(4);
stack.pop
stack.pop;
stack.push(5);
```

Select one:

- ○ 4

- ○ 5

- ○ 3

- ○ 1

- ● 2   ✓

Your answer is correct.

The correct answer is: 2

Question **4**

Correct

Mark 1.00 out of 1.00

Consider the following operations:

```
Stack<Integer> stack = new Stack<Integer>();
stack.push(4);
stack.pop;
stack.push(1);
stack.push(2);
stack.push(5);
stack.pop;
stack.pop;
stack.push(3);
```

What element would be returned by another pop() operation?

Select one:

- ○ 2

- ○ 1

- ○ 4

- ○ 5

- ◉ 3   ✓

Your answer is correct.

The correct answer is: 3

Question **5**

Correct

Mark 1.00 out of 1.00

What is the result of the sequence of stack operations below, where each word means `push(word)` and each dash means `pop()`?

```
it was - the best - of times - - - it was - the - -
```

Select one:

- ◉ was best times of the was the it   ✓

- ○ it was the best of times it was

- ○ it the best of times it was the

- ○ the was it times of best the was

- ○ was best times of the was the

Your answer is correct.

The correct answer is: was best times of the was the it

Question **6**

Correct

Mark 1.00 out of 1.00

Using a `ResizingArrayStackOfStrings` (Algorithm 1.1, p. 141) where each word means `push(word)` and each dash means `pop()`, what is the size of the array after the following operations:

```
it was - the best - of times - - - it was - the - -
```

Select one:

○ a. 4

○ b. 1

○ c. 8

◉ d. 2   ✓

Your answer is correct.

The correct answer is: 2

Question **7**

Partially correct

Mark 0.67 out of 1.00

Suppose that a client performs an interleaved sequence of (stack) `push()` and `pop()` operations. The push operations are `push(0)` to `push(9)` in that order; interleaved with pop operations. Which of the following sequence(s) of popped elements *cannot* occur?

Select one or more:

☐ 4 3 2 1 0 5 6 7 8 9

☑ 0 4 6 5 3 8 1 7 2 9   ✓

☐ 1 2 3 4 5 6 9 8 7 0

☐ 2 1 4 3 6 5 8 7 9 0

☑ 4 6 8 7 5 3 2 9 0 1   ✓

☐ 2 5 6 7 4 8 9 3 1 0

☐ 1 4 7 9 8 6 5 3 0 2

☐ 4 3 2 1 0 9 8 7 6 5

Your answer is partially correct.

You have correctly selected 2.
The correct answers are: 4 6 8 7 5 3 2 9 0 1, 0 4 6 5 3 8 1 7 2 9, 1 4 7 9 8 6 5 3 0 2

Question **8**

Correct

Mark 1.00 out of 1.00

Suppose that a client performs an interleaved sequence of (queue) `enqueue()` and `dequeue()` operations. The enqueue operations are `enqueue(0)` to `enqueue(9)` in that order; interleaved with dequeue operations. Which of the following sequence(s) of dequeued elements *cannot* occur?

Select one or more:

☑ 2 5 6 7 4 8 9 3 1 0   ✓

☑ 4 6 8 7 5 3 2 9 0 1   ✓

☑ 4 3 2 1 0 5 6 7 8 9   ✓

☐ 0 1 2 3 4 5 6 7 8 9

Your answer is correct.

The correct answers are: 4 6 8 7 5 3 2 9 0 1, 2 5 6 7 4 8 9 3 1 0, 4 3 2 1 0 5 6 7 8 9

Question **9**

Correct

Mark 1.00 out of 1.00

What does the following code fragment do to the queue q?

```java
// java
Stack<String> stack = new Stack<String>();
while(!q.isEmpty())
    stack.push(q.dequeue());
while(!stack.isEmpty())
    q.enqueue(stack.pop());
```

```python
# python
stack = Stack()
while !q.isEmpty():
    stack.push(q.dequeue())
while !stack.isEmpty():
    q.enqueue(stack.pop())
```

Select one:

○ Shuffles q

◉ Reverses order of q   ✓

○ Nothing - the queue is identical after the code fragment

○ Removes the last element of the queue

Your answer is correct.

The correct answer is: Reverses order of q

Question **10**

Correct

Mark 1.00 out of 1.00

Suppose that **t** and **x** are linked list nodes. What does the following code fragment do?

```
t.next = x.next;
x.next = t;
```

Select one:

○ Removes node x from the list

○ Inserts node x immediately after node t

◉ Inserts node t immediately after node x   ✓

○ Removes node t from the list

Your answer is correct.

The correct answer is: Inserts node t immediately after node x

Question **11**

Correct

Mark 1.00 out of 1.00

Assume `Stack` is a `edu.princeton.cs.algs4.Stack`. Consider the following piece of Java code:

```
Stack<Integer> S= new Stack<Integer>();
S.push("foo");
S.push(42);
```

What happens?

Select one:

○ a.   This compiles just fine, but produces a run-time error.

○ b.   Java's compiler gives an error at compile time, complaining about incompatible types at `push(42)`.

○ c.   Nothing bad happens; Java handles collections of multiple types just fine.

◉ d.   Java's compiler gives an error at compile time, complaining about incompatible types at `push("foo")`.   ✓

Your answer is correct.

The correct answer is: Java's compiler gives an error at compile time, complaining about incompatible types at `push("foo")`.

Question **12**

Incorrect

Mark 0.00 out of 1.00

Assume `Stack` is imported from `itu.algs4.fundamentals.stack`. Consider the following piece of Python code:

```
S = Stack()
S.push("foo")
S.push(42)
```

What happens?

Select one:

○ a.   The code runs just fine, but the integer `42` will be cast to the string `"42"`, which may lead to confusion later.   ✕

○ b.   Python gives an error at runtime, complaining about incompatible types at `push("foo")`.

○ c.   Python gives an error at runtime, complaining about incompatible types at `push(42)`.

○ d.   Nothing bad happens; Python handles collections of multiple types just fine.

Your answer is incorrect.

The correct answer is: Nothing bad happens; Python handles collections of multiple types just fine.

Question **13**

Correct

Mark 1.00 out of 1.00

Let `Stack` be the stack from `edu.princeton.cs.algs4.Stack` and `Iterator` the iterator from `java.util.Iterator`.

```
Stack<Integer> S= new Stack<Integer>();
S.push(1);
S.push(2);
Iterator<Integer> I = S.iterator();
Iterator<Integer> J = S.iterator();
int x = I.next();
int y = J.next();
```

What are x and y?

Select one:

○ a.   Both `1`

● b.   Both `2`   ✓

○ c.   `x == 2` but `y == 1`

○ d.   `x == 1` but `y == 2`

Your answer is correct.

The correct answer is: Both `2`

Question **14**

Correct

Mark 1.00 out of 1.00

Let `Stack` be the stack from `itu.algs4.fundamentals.stack`.

```
S = Stack()
S.push(1)
S.push(2)
I = iter(S)
J = iter(S)
x = next(I)
y = next(J)
```

What are x and y?

Select one:

- a.   `x == 1` but `y == 2`
- b.   Both `1`
- c.   `x == 2` but `y == 1`
- d.   Both `2`   ✓

Your answer is correct.

The correct answer is: Both `2`