



Bahria University, Islamabad Campus

Department of Computer Science

Mobile App Development Lab

CSL 341

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Lab Journal # 02

Github Repository Link:

<https://github.com/alirnaqvi/Mobile-Application-Development-Lab>

Task # 01:

Solution:

Code:

```
int findLargest(List<int> numbers) {
    if (numbers.isEmpty) {
        throw ArgumentError("List is empty");
    }

    int largest = numbers[0];
    for (int num in numbers) {
        if (num > largest) {
            largest = num;
        }
    }
    return largest;
}

void main() {
    List<int> numbers = [12, 45, 78, 34, 89, 23];
    print("Largest number: ${findLargest(numbers)}");
}
```

Output:



Task # 02:**Solution:****Code:**

```
List<int> mergeSort(List<int> list) {
    if (list.length <= 1) {
        return list;
    }

    int mid = list.length ~/ 2;
    List<int> left = mergeSort(list.sublist(0, mid));
    List<int> right = mergeSort(list.sublist(mid));

    return merge(left, right);
}

List<int> merge(List<int> left, List<int> right) {
    List<int> sortedList = [];
    int i = 0, j = 0;

    while (i < left.length && j < right.length) {
        if (left[i] < right[j]) {
            sortedList.add(left[i]);
            i++;
        } else {
            sortedList.add(right[j]);
            j++;
        }
    }

    sortedList.addAll(left.sublist(i));
    sortedList.addAll(right.sublist(j));

    return sortedList;
}

void main() {
    List<int> numbers = [38, 27, 43, 3, 9, 82, 10];
    print("Sorted list: ${mergeSort(numbers)}");
}
```

Output:



The screenshot shows the DartPad web interface. On the left, a code editor displays a Dart implementation of merge sort. The code defines a `mergeSort` function that recursively splits a list and a `merge` function that combines sorted sublists. A 'Run' button is visible. On the right, the output console shows the result: 'Sorted list: [3, 9, 10, 27, 38, 43, 82]'. The bottom status bar indicates 'Dart 3.7.0 • Flutter 3.29.1' and 'Stable channel'.

```
1 List<int> mergeSort(List<int> list) {
2   if (list.length <= 1) {
3     return list;
4   }
5
6   int mid = list.length ~/ 2;
7   List<int> left = mergeSort(list.sublist(0, mid));
8   List<int> right = mergeSort(list.sublist(mid));
9
10  return merge(left, right);
11 }
12
13 List<int> merge(List<int> left, List<int> right) {
14   List<int> sortedList = [];
15   int i = 0, j = 0;
16
17   while (i < left.length && j < right.length) {
18     if (left[i] < right[j]) {
```

Task # 03:

Solution:

Code:

```
class Stack<T> {
  List<T> _items = [];

  void push(T item) {
    _items.add(item);
  }

  T? pop() {
    if (isEmpty()) {
      print("Stack is empty");
      return null;
    }
    return _items.removeLast();
  }

  T? peek() {
    if (isEmpty()) {
      print("Stack is empty");
      return null;
    }
    return _items.last;
  }

  bool isEmpty() {
    return _items.isEmpty;
  }
}
```

```

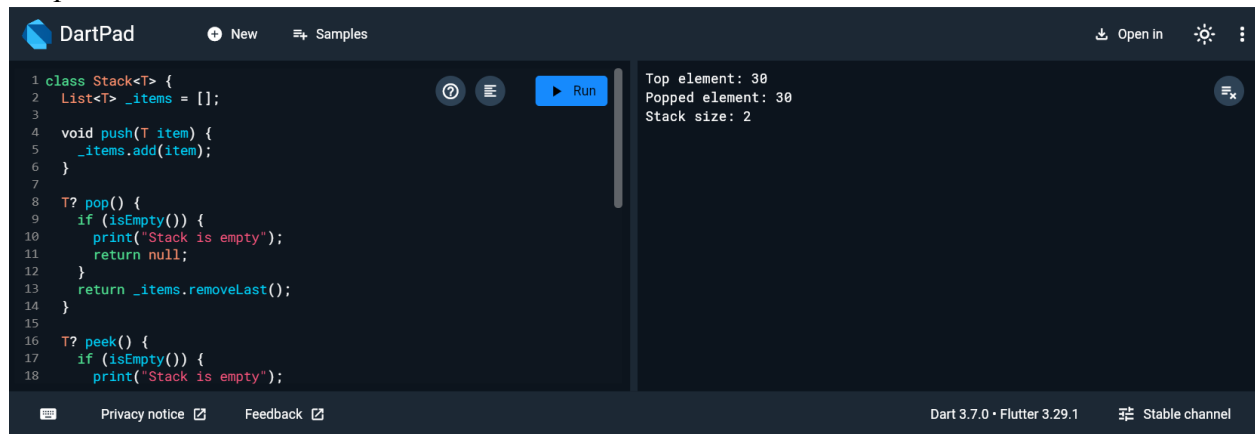
    int size() {
        return _items.length;
    }
}

void main() {
    Stack<int> stack = Stack<int>();
    stack.push(10);
    stack.push(20);
    stack.push(30);

    print("Top element: ${stack.peek()}");
    print("Popped element: ${stack.pop()}");
    print("Stack size: ${stack.size()}");
}

```

Output:



The screenshot shows the DartPad interface. On the left, the Dart code is displayed with line numbers 1 through 18. A blue 'Run' button is visible. On the right, the output of the program is shown in a dark-themed console window. The output consists of three lines: 'Top element: 30', 'Popped element: 30', and 'Stack size: 2'. The bottom status bar indicates 'Dart 3.7.0 • Flutter 3.29.1' and 'Stable channel'.

```

1 class Stack<T> {
2   List<T> _items = [];
3
4   void push(T item) {
5     _items.add(item);
6   }
7
8   T? pop() {
9     if (isEmpty()) {
10      print("Stack is empty");
11      return null;
12    }
13    return _items.removeLast();
14  }
15
16  T? peek() {
17    if (isEmpty()) {
18      print("Stack is empty");

```

Top element: 30
Popped element: 30
Stack size: 2

Dart 3.7.0 • Flutter 3.29.1 Stable channel