Tugas   : 04

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Mata Kuliah   : Struktur Data

1. **Source Code**

```cpp
#include <iostream>
#include <queue>
#include <string>
#include <deque>

int main() {
    // Problem 1: Priority Queue
    std::priority_queue<int> pq;

    pq.push(70);
    pq.push(80);
    pq.push(201);
    pq.push(20);
    pq.push(30);
    pq.push(100);
    pq.push(90);
    pq.push(50);
    pq.push(101);
    pq.push(200);
    pq.push(10);
    pq.push(150);

    std::cout << "Priority Queue: ";
    while (!pq.empty()) {
        std::cout << pq.top() << " ";
        pq.pop();
    }
    std::cout << std::endl;

    // Problem 2: Queue with Element Count
    std::queue<std::string> q;

    q.push("Maarten Paes");
    q.push("Nathan Tjoe-A-On");
    q.push("Thom Haye");
    q.push("Rafael Struick");
    q.push("Ragnar Oratmangoen");
    q.push("Mees Hilgers");
```

```cpp
    q.push("Eliano Reijnders");
    q.push("Shayne Pattynama");
    q.push("Jairo Riedewald");
    q.push("Mauro Ziljstra");

    std::cout << "Queue Size: " << q.size() << std::endl;

    std::cout << "Queue Elements: ";
    int i = 1;
    while (!q.empty()) {
        std::cout << "Element " << i << ": " << q.front() << std::endl;
        q.pop();
        i++;
    }

    // Problem 3: Deque Operations
    std::deque<int> dq;

    // Operasi push_back
    dq.push_back(100);
    dq.push_back(120);
    dq.push_back(140);
    dq.push_back(160);
    dq.push_back(180);
    dq.push_back(200);
    dq.push_back(220);
    dq.push_back(240);
    dq.push_back(260);
    dq.push_back(280);
    dq.push_back(300);
    dq.push_back(320);
    dq.push_back(340);
    dq.push_back(360);

    // Menampilkan deque setelah push_back
    std::cout << "Deque setelah push_back: ";
    for (int n : dq) {
        std::cout << n << " ";
    }
    std::cout << std::endl;

    // Operasi push_front
    dq.push_front(90);
    dq.push_front(80);

    // Menampilkan deque setelah push_front
    std::cout << "Deque setelah push_front: ";
    for (int n : dq) {
        std::cout << n << " ";
    }
    std::cout << std::endl;

    // Operasi pop_front
    dq.pop_front();
    dq.pop_front();
```

```cpp
    // Menampilkan deque setelah pop_front
    std::cout << "Deque setelah pop_front: ";
    for (int n : dq) {
        std::cout << n << " ";
    }
    std::cout << std::endl;

    // Operasi pop_back
    dq.pop_back();
    dq.pop_back();

    // Menampilkan deque setelah pop_back
    std::cout << "Deque setelah pop_back: ";
    for (int n : dq) {
        std::cout << n << " ";
    }
    std::cout << std::endl;

    return 0;
}
```

2. Hasil yang Ditampilkan

```
Priority Queue: 201 200 150 101 100 90 80 70 50 30 20 10
Queue Size: 10
Queue Elements: Element 1: Maarten Paes
Element 2: Nathan Tjoe-A-On
Element 3: Thom Haye
Element 4: Rafael Struick
Element 5: Ragnar Oratmangoen
Element 6: Mees Hilgers
Element 7: Eliano Reijnders
Element 8: Shayne Pattynama
Element 9: Jairo Riedewald
Element 10: Mauro Ziljstra
Deque setelah push_back: 100 120 140 160 180 200 220 240 260 280 300 320 340 360
Deque setelah push_front: 80 90 100 120 140 160 180 200 220 240 260 280 300 320 340 360
Deque setelah pop_front: 100 120 140 160 180 200 220 240 260 280 300 320 340 360
Deque setelah pop_back: 100 120 140 160 180 200 220 240 260 280 300 320
```