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Section – A8_B2

Roll no. – 31

Practical – 7

Code-

```c
#include <stdio.h>
#include <float.h>

#define MAX_KEYS 100

double calculateOptimalCost(int n, double p[], double q[]) {
    double e[MAX_KEYS + 2][MAX_KEYS + 1];
    double w[MAX_KEYS + 2][MAX_KEYS + 1];

    for (int i = 1; i <= n + 1; i++) {
        e[i][i - 1] = q[i - 1];
        w[i][i - 1] = q[i - 1];
    }

    for (int length = 1; length <= n; length++) {
        for (int i = 1; i <= n - length + 1; i++) {
            int j = i + length - 1;
            e[i][j] = DBL_MAX;
            w[i][j] = w[i][j - 1] + p[j] + q[j];
            for (int r = i; r <= j; r++) {
                double t = e[i][r - 1] + e[r + 1][j] + w[i][j];
                if (t < e[i][j]) {
                    e[i][j] = t;
                }
            }
        }
    }
    return e[1][n];
}

int main() {
    int n = 4;
    int keys[] = {0, 10, 20, 30, 40};
    double p[] = {0, 0.1, 0.2, 0.4, 0.3};
```

```
36      double q[] = {0.05, 0.1, 0.05, 0.05, 0.1};
37
38      double minCost = calculateOptimalCost(n, p, q);
39
40      printf("%.4f\n", minCost);
41
42      return 0;
43  }
```

Output –

```
[Running] cd "c:\Users\DT USER\Desktop\Project\" && gcc tempCodeRunnerFile.c -o
tempCodeRunnerFile && "c:\Users\DT USER\Desktop\Project\"tempCodeRunnerFile
2.9000
```