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Section – A8_B2

Roll no. – 31

Practical – 6

Code-

```
1  #include <stdio.h>
2  #include <float.h>
3
4  #define MAX_KEYS 100
5
6  double calculateOptimalCost(int n, double p[], double q[]) {
7      double e[MAX_KEYS + 2][MAX_KEYS + 1];
8      double w[MAX_KEYS + 2][MAX_KEYS + 1];
9
10     for (int i = 1; i <= n + 1; i++) {
11         e[i][i - 1] = q[i - 1];
12         w[i][i - 1] = q[i - 1];
13     }
14
15     for (int length = 1; length <= n; length++) {
16         for (int i = 1; i <= n - length + 1; i++) {
17             int j = i + length - 1;
18             e[i][j] = DBL_MAX;
19             w[i][j] = w[i][j - 1] + p[j] + q[j];
20
21             for (int r = i; r <= j; r++) {
22                 double t = e[i][r - 1] + e[r + 1][j] + w[i][j];
23                 if (t < e[i][j]) {
24                     e[i][j] = t;
25                 }
26             }
27         }
28     }
29     return e[1][n];
30 }
31
32 int main() {
33     int n = 4;
34     int keys[] = {0, 10, 20, 30, 40};
35     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
```