23CSE211 – DAA LAB ACTIVITY

Kavin.J.S – CH.SC.U4CSE24119

Job Sequencing Problem

Let there be 14 jobs with the following profits:

22, 19, 29, 28, 30, 21, 27, 25, 24, 26, 4, 27, 19, 11

The corresponding job completion times (deadlines) are:

3, 3, 8, 6, 7, 5, 10, 4, 6, 12, 13, 2, 14, 1

Task:
Find the optimal job sequence using a greedy method and determine the maximum total profit.

Code:

```
#include <stdio.h>
#define MAX 100

// sort by profit descending
void sortByProfit(int p[], int d[], int n){
   int temp;

   for(int i = 0; i < n - 1; i++){
      int max = i;
      for(int j = i + 1; j < n; j++){
         if(p[j] > p[max])
            max = j;
      }

      // swap profit
      temp = p[i];
      p[i] = p[max];
      p[max] = temp;

      // swap deadline
      temp = d[i];
      d[i] = d[max];
      d[max] = temp;
   }
}

// job sequencing
int jobSequencing(int p[], int d[], int n){
   sortByProfit(p, d, n);

   int maxDeadline = 0;
   for(int i = 0; i < n; i++)
      if(d[i] > maxDeadline)
         maxDeadline = d[i];
```

```
    int slot[MAX] = {0};
    int profit = 0;

    for(int i = 0; i < n; i++){
        for(int j = d[i]; j > 0; j--){
            if(slot[j] == 0){
                slot[j] = 1;
                profit += p[i];
                break;
            }
        }
    }

    return profit;
}

int main(){
    int n;
    int p[MAX], d[MAX];

    printf("Enter number of jobs: ");
    scanf("%d", &n);

    printf("Enter profits:\n");
    for(int i = 0; i < n; i++)
        scanf("%d", &p[i]);

    printf("Enter deadlines:\n");
    for(int i = 0; i < n; i++)
        scanf("%d", &d[i]);

    int ans = jobSequencing(p, d, n);
    printf("Maximum Profit = %d\n", ans);

    return 0;
}
```

Output Screenshot:

```
┌──(kavinjs㉿kali)-[~]
└─$ cd /home/kavinjs/CH.SC.U4CSE24119/DAA_24119/

┌──(kavinjs㉿kali)-[~/CH.SC.U4CSE24119/DAA_24119]
└─$ gcc js.c -o js

┌──(kavinjs㉿kali)-[~/CH.SC.U4CSE24119/DAA_24119]
└─$ ./js
Enter number of jobs: 14
Enter profits:
22 19 29 28 30 21 27 25 24 26 14 27 19 11
Enter deadlines:
3 3 8 6 7 5 10 4 6 12 13 2 14 1
Maximum Profit = 292
```