

Q1

```
1 #include <stdio.h>
2 #include <stdlib.h>
3
4
5 int main(int argc, char *argv[]) {
6     return 0;#include <stdio.h>
7     #include <stdlib.h>
8
9 int main() {
10     int n, add, threshold;
11     printf("Hours: ");
12     scanf("%d", &n);
13
14     int *steps = malloc(n * sizeof(int));
15
16     for (int i = 0; i < n; i++)
17         scanf("%d", &steps[i]);
18
19     printf("More hours: ");
20     scanf("%d", &add);
21
22     steps = realloc(steps, (n + add) * sizeof(int));
23
24     for (int i = n; i < n + add; i++)
25         scanf("%d", &steps[i]);
26
27     n += add;
28
29     printf("Threshold: ");
30     scanf("%d", &threshold);
31
32     int max = steps[0], total = 0, above = 0;
33     for (int i = 0; i < n; i++) {
34         if (steps[i] > max) max = steps[i];
35         if (steps[i] > threshold) above++;
36         total += steps[i];
37     }
38
39     FILE *f = fopen("fitness_tracker.txt", "w");
40     fprintf(f, "%d %d %d", max, total, above);
41     fclose(f);
42
43     free(steps);
44 }
45
```

```
main.c fitness_tracker.txt
1 9 32 0

Hours: 5
6
5
4
3
2
More hours: 3
2
1
9
Threshold: 87

...Program finished with exit code 0
Press ENTER to exit console
```

Q2

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <ctype.h>
4
5 int check(char *s, int i) {
6     if (s[i] == '\0') return 1;
7     if (!isalnum(s[i])) return 0;
8     return check(s, i+1);
9 }
10
11 typedef struct {
12     char name[50];
13     char roll[20];
14     int seat;
15 } Seat;
16
17
18 int main() {
19     int n, add;
20     printf("Students: ");
21     scanf("%d", &n);
22
23     Seat *s = malloc(n * sizeof(Seat));
24
25     for (int i = 0; i < n; i++) {
26         scanf("%s %s %d", s[i].name, s[i].roll, &s[i].seat);
27         while (!check(s[i].roll, 0))
28             scanf("%s", s[i].roll);
29     }
30
31     printf("Add more: ");
32     scanf("%d", &add);
33
34     s = realloc(s, (n + add) * sizeof(Seat));
35
36     for (int i = n; i < n + add; i++) {
37         scanf("%s %s %d", s[i].name, s[i].roll, &s[i].seat);
38         while (!check(s[i].roll, 0))
39             scanf("%s", s[i].roll);
40     }
41
42     FILE *f = fopen("seating.txt", "w");
43     for (int i = 0; i < n + add; i++)
44         fprintf(f, "%s %s %d\n", s[i].name, s[i].roll, s[i].seat);
45
46     fclose(f);
47     free(s);
48 }
49
```

```
1 4 3 2
2 1 6 7
3 5 1 2
4 3 4 5
5 5 4 3
6 2 1 1
7 2 3 4
8 5 6 7
9 8 5 4
10 4 4 4
11

6
7
5
1
2
3
4
5
Add more: 6
5
4
3
2
1
1
2
3
4

5
6
7
8
5
4
4
4
4

...Program finished with exit code 0
Press ENTER to exit console.
```

Q3

```
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3
4 int main() {
5     int n, add, th;
6     printf("Readings: ");
7     scanf("%d", &n);
8
9     float *t = malloc(n * sizeof(float));
10
11    for (int i = 0; i < n; i++)
12        scanf("%f", &t[i]);
13
14    printf("Add: ");
15    scanf("%d", &add);
16
17    t = realloc(t, (n + add) * sizeof(float));
18
19    for (int i = n; i < n + add; i++)
20        scanf("%f", &t[i]);
21
22    n += add;
23
24    printf("Alert threshold: ");
25    scanf("%d", &th);
26
27    float max = t[0], min = t[0];
28    int count = 0;
29
30    for (int i = 0; i < n; i++) {
31        if (t[i] > max) max = t[i];
32        if (t[i] < min) min = t[i];
33        if (t[i] > th) count++;
34    }
35
36    FILE *f = fopen("temperature_summary.txt", "w");
37    fprintf(f, "% .2f % .2f % d", max, min, count);
38    fclose(f);
39
40    free(t);
41 }
```

```
main.c | temperature_sum... :: 1 7.00 2.00 0
Readings: 4
3
5
6
7
Add: 4
3
2
7
6
Alert threshold: 8

...Program finished with exit code 0
Press ENTER to exit console.
```

Q4

```
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3
4 typedef struct {
5     char title[50];
6     char id[20];
7     char time[20];
8     int due;
9 } Log;
10
11 int main() {
12     int n;
13     scanf("%d", &n);
14
15     Log *a = malloc(n * sizeof(Log));
16     FILE *f = fopen("checkout_log.csv", "a");
17
18     for (int i = 0; i < n; i++) {
19         scanf("%s %s %s %d", a[i].title, a[i].id, a[i].time, &a[i].due);
20         fprintf(f, "%s,%s,%s,%d\n", a[i].title, a[i].id, a[i].time, a[i].due);
21     }
22
23     fclose(f);
24     free(a);
25 }
```

Q5

```
#include <stdio.h>
#include <stdlib.h>

int main() {
    float rate;
    printf("Rate: ");
    scanf("%f", &rate);

    int n;
    printf("Rentals: ");
    scanf("%d", &n);

    float *d = malloc(n * sizeof(float));

    for (int i = 0; i < n; i++)
        scanf("%f", &d[i]);

    float total = 0, max = d[0];

    FILE *f = fopen("Rental_Invoices.txt", "w");

    for (int i = 0; i < n; i++) {
        float cost = d[i] * rate;
        fprintf(f, "%.2f %.2f\n", d[i], cost);
        total += d[i];
        if (d[i] > max) max = d[i];
    }

    fprintf(f, "Total %.2f Max %.2f", total, max);
    fclose(f);

    free(d);
}
```

```
main.c Rental_Invoices.txt
1 6.00 60.00
2 7.00 70.00
3 8.00 80.00
4 5.00 50.00
5 4.00 40.00
6 Total 30.00 Max 8.00

Rate: 10
Rentals: 5
6
7
8
5
4

...Program finished with exit code 0
Press ENTER to exit console.
```

Q6

```
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3
4 int sum(int *a, int i, int n) {
5     if (i == n) return 0;
6     return a[i] + sum(a, i+1, n);
7 }
8
9 int main() {
10     int n;
11     printf("Gates: ");
12     scanf("%d", &n);
13
14     int *g = malloc(n * sizeof(int));
15
16     for (int i = 0; i < n; i++)
17         scanf("%d", &g[i]);
18
19     int total = sum(g, 0, n);
20
21     int max = g[0], gate = 0;
22     for (int i = 0; i < n; i++)
23         if (g[i] > max) { max = g[i]; gate = i; }
24
25     FILE *f = fopen("attendance.txt", "a");
26     fprintf(f, "%d %d %d\n", total, gate, max);
27     fclose(f);
28
29     free(g);
30 }
31
```

The screenshot shows a terminal window with two tabs at the top: "main.c" and "attendance.txt". The "attendance.txt" tab is active, displaying the following content:

```
1 16 0 4
2 13 0 5
3
```

Below the tabs is a toolbar with icons for file operations. The main window displays the program's output:

```
Gates: 4
5
3
3
2

...Program finished with exit code 0
Press ENTER to exit console.
```

Q7

```
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3
4 typedef struct {
5     char name[50];
6     int qty;
7     float price;
8 } Med;
9
10 int main() {
11     int n;
12     scanf("%d", &n);
13
14     Med *m = malloc(n * sizeof(Med));
15
16     for (int i = 0; i < n; i++)
17         scanf("%s %d %f", m[i].name, &m[i].qty, &m[i].price);
18
19     float total = 0;
20
21     FILE *f = fopen("medicine_inventory.txt", "w");
22
23     for (int i = 0; i < n; i++) {
24         fprintf(f, "%s %d %.2f\n", m[i].name, m[i].qty, m[i].price);
25         total += m[i].qty * m[i].price;
26     }
27
28     fprintf(f, "Total %.2f", total);
29     fclose(f);
30
31     free(m);
32 }
33
```

The terminal window shows the output of the program. It first displays the contents of the 'medicine\_inventory.txt' file, which contains four lines of data: '1 4 2 1.00', '2 3 4 5.00', '3 6 5 4.00', and '4 Total 42.00'. Below this, the terminal prompt shows the numbers 3, 4, 2, 1, 3, 4, 5, 6, 5, 4, followed by the message "...Program finished with exit code 0 Press ENTER to exit console.".

```
1 4 2 1.00
2 3 4 5.00
3 6 5 4.00
4 Total 42.00

3
4
2
1
3
4
5
6
5
4

...Program finished with exit code 0
Press ENTER to exit console.
```

