

Q1

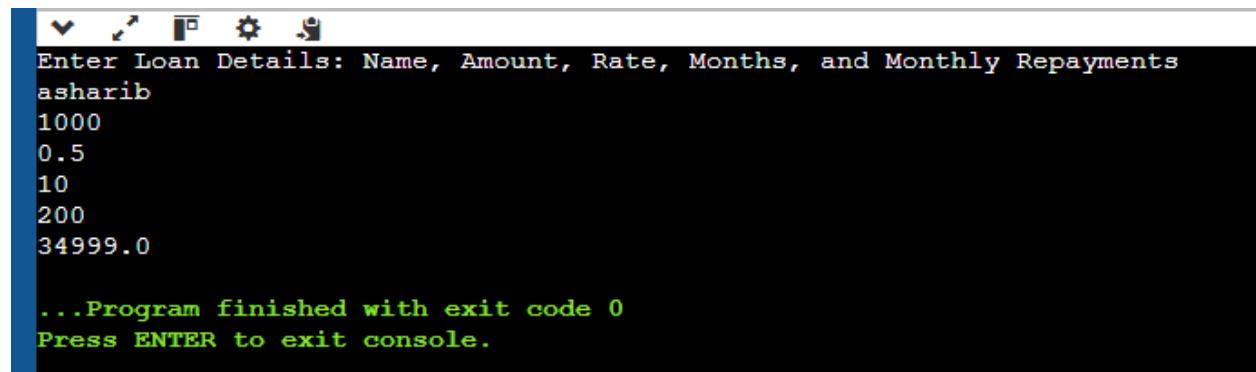
```
1 #include <stdio.h>
2 #include <math.h>
3
4 struct Building {
5     int id;
6     int initialHeight;
7     float growthRate;
8 };
9
10 int calcHeight(struct Building *b, int day) {
11     int height = b->initialHeight;
12
13     for (int i = 1; i <= day; i++) {
14         int increase = floor(height * b->growthRate);
15         height += increase;
16     }
17
18     return height;
19 }
20
21 int main() {
22     struct Building b = {1, 100, 0.10};
23
24     int day;
25     printf("Enter day: ");
26     scanf("%d", &day);
27
28     printf("Estimated Height: %d\n", calcHeight(&b, day));
29     return 0;
30 }
31
```

```
Enter day: 5
Estimated Height: 160

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

Q2

```
1 #include <stdio.h>
2
3 struct Loan {
4     char name[20];
5     double amount;
6     double rate;
7     double months;
8     double monthly;
9 }
10
11 double pay(struct Loan *l, int n) {
12     if (n == 0) return l->amount;
13     double p = pay(l, n - 1);
14     return p + l->monthly + (p * l->rate);
15 }
16
17 int main() {
18     struct Loan l;
19     printf("Enter Loan Details: Name, Amount, Rate, Months, and Monthly Repayments\n");
20     scanf("%s %lf %lf %lf %lf", l.name, &l.amount, &l.rate, &l.months, &l.monthly);
21     printf("%.1lf", pay(&l, (int)l.months));
22 }
23
```



The screenshot shows a terminal window with the following output:

```
Enter Loan Details: Name, Amount, Rate, Months, and Monthly Repayments
asharib
1000
0.5
10
200
34999.0

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

Q3

```
1 #include <stdio.h>
2
3 struct Patient {
4     char name[30];
5     int age;
6     int healthScore;
7 };
8
9 struct DailyReport {
10    int day;
11    int scoreChange;
12 };
13
14 int finalScore(struct Patient *p, struct DailyReport reports[], int n) {
15     if (n == 0) return p->healthScore;
16
17     int prev = finalScore(p, reports, n - 1);
18     return prev + reports[n - 1].scoreChange;
19 }
20
21 int main() {
22     struct Patient p;
23     struct DailyReport reports[10];
24     int n;
25
26     printf("Enter patient name, age, and initial health score:\n");
27     scanf("%s %d %d", p.name, &p.age, &p.healthScore);
28
29     printf("Enter number of days:\n");
30     scanf("%d", &n);
31
32     printf("Enter daily reports (day scoreChange):\n");
33     for (int i = 0; i < n; i++) {
34         scanf("%d %d", &reports[i].day, &reports[i].scoreChange);
35     }
36
37     int result = finalScore(&p, reports, n);
38
39     printf("Final health score after %d days = %d\n", n, result);
40
41     return 0;
42 }
43
```

```
Enter patient name, age, and initial health score:  
asharib  
20  
50  
Enter number of days:  
2  
Enter daily reports (day scoreChange):  
25  
15  
15  
35  
Final health score after 2 days = 100  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

Q4

```
1 #include <stdio.h>  
2  
3 struct Weather {  
4     char city[20];  
5     double base;  
6     double cool;  
7 };  
8  
9 double T(double base, double cool, int n) {  
10     if(n==0) return base;  
11     double prev = T(base,cool,n-1);  
12     return prev + 1 - cool;  
13 }  
14  
15 int main() {  
16     struct Weather W;  
17     printf("Enter Weather Deatails for a City, Name, Base Temp, Cooling Factor \n");  
18     scanf("%s %lf %lf", W.city, &W.base, &W.cool);  
19     printf("%.11lf", T(W.base,W.cool,5));  
20 }
```

```
Enter Weather Deatails for a City, Name, Base Temp, Cooling Factor  
karacho  
30  
0.5  
32.50000000000  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

Q5

```
1 #include <stdio.h>
2 #include <math.h>
3
4 struct File {
5     char fileName[30];
6     double originalSize;
7     double reductionRate;
8 };
9
10 double compressSize(struct File *f, int k) {
11     if (k == 0) return f->originalSize;
12
13     double prev = compressSize(f, k - 1);
14     double reduce = ceil(prev * f->reductionRate);
15
16     return prev - reduce;
17 }
18
19 int main() {
20     struct File f;
21     int k;
22
23     printf("Enter file name, original size, and reduction rate:\n");
24     scanf("%s %lf %lf", f.fileName, &f.originalSize, &f.reductionRate);
25
26     printf("Enter number of compression rounds:\n");
27     scanf("%d", &k);
28
29     double finalSize = compressSize(&f, k);
30
31     printf("Estimated file size after %d rounds: %.2lf\n", k, finalSize);
32
33     return 0;
34 }
35
```

```
Enter file name, original size, and reduction rate:
labwork
100
0.5
Enter number of compression rounds:
5
Estimated file size after 5 rounds: 3.00

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

Q6

```
allc
1 #include <stdio.h>
2
3 struct Person {
4     char name[20];
5     int age;
6 };
7
8 struct Student {
9     struct Person p;
10    int credit[5];
11    int rate;
12 };
13
14 int fee(struct Student *s, int n) {
15    if(n==0) {
16        return 0;
17    }
18    return fee(s,n-1) + s->credit[n-1] * s->rate;
19 }
20
21 int main() {
22     int i;
23     struct Student s;
24     printf("Enter Students Name, Age and Rate Per Credit\n");
25     scanf("%s %d %d", s.p.name, &s.p.age, &s.rate);
26     printf("Enter Credit Hours (5)\n");
27     for (i =0; i<5;i++){
28         scanf("%d", &s.credit[i]);
29     }
30     printf("%d", fee(&s,5));
31 }
```

```
Enter Students Name, Age and Rate Per Credit
asharib
20
100
Enter Credit Hours (5)
5
3
4
2
1
1500

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

Q7

```
main.c
1 #include <stdio.h>
2
3 int maxTip(int tips[], int n, int i) {
4     if (i >= n) return 0;
5
6     int take = tips[i] + maxTip(tips, n, i + 2);
7     int skip = maxTip(tips, n, i + 1);
8
9     return (take > skip) ? take : skip;
10 }
11
12 int main() {
13     int n;
14     printf("Enter number of stops: ");
15     scanf("%d", &n);
16
17     int tips[n];
18     printf("Enter tip amounts for each stop:\n");
19     for (int i = 0; i < n; i++) {
20         scanf("%d", &tips[i]);
21     }
22
23     int result = maxTip(tips, n, 0);
24
25     printf("Maximum tip the rider can collect: %d\n", result);
26     return 0;
27 }
28 }
```

```
▼ □ ⚙ ⚙  
Enter number of stops: 5  
Enter tip amounts for each stop:  
50  
100  
20  
0  
200  
Maximum tip the rider can collect: 300
```

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