

Q1

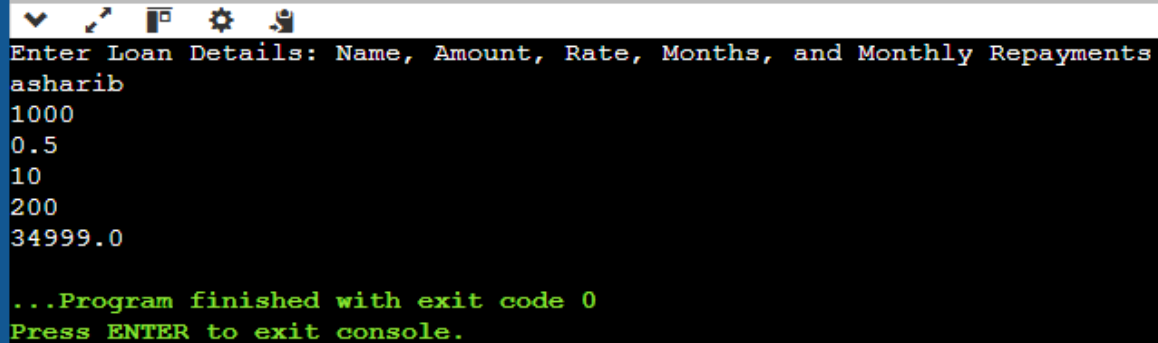
```
1  #include <stdio.h>
2  #include <math.h>
3
4  struct Building {
5      int id;
6      int initialHeight;
7      float growthRate;
8  };
9
10 int calcHeight(struct Building *b, int day) {
11     int height = b->initialHeight;
12
13     for (int i = 1; i <= day; i++) {
14         int increase = floor(height * 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("%.11f", pay(&l, (int)l.months));
22 }
23
```

A terminal window with a dark background and a light blue title bar. The title bar contains icons for window control (minimize, maximize, close) and a search icon. The terminal displays the output of the program. It starts with a prompt "Enter Loan Details: Name, Amount, Rate, Months, and Monthly Repayments". The user enters "asharib" for the name, "1000" for the amount, "0.5" for the rate, "10" for the months, and "200" for the monthly repayment. The program then outputs "34999.0". At the bottom, it says "...Program finished with exit code 0" and "Press ENTER to exit console.".

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
```

```
32.500000000000
```

```
...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

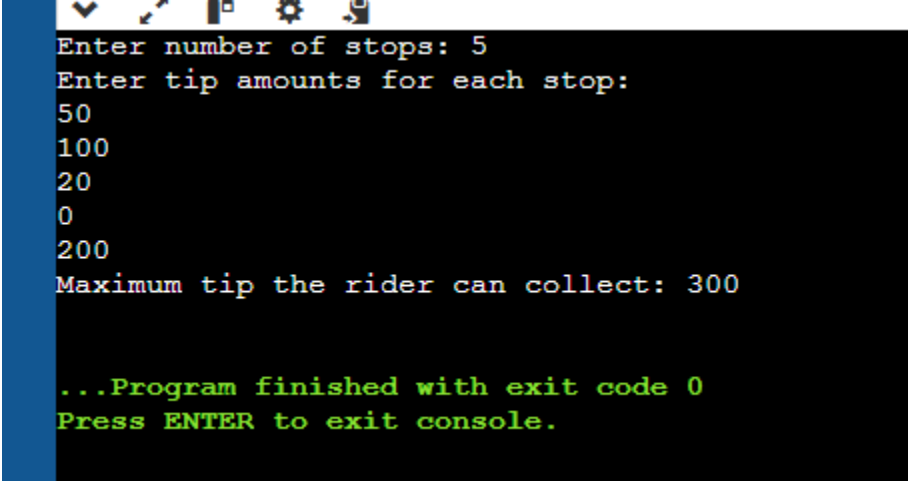
```
1  #include <stdio.h>
2
3  struct Person {
4      char name[20];
5      int age;
6  };
7
8  struct Student {
9      struct Person p;
10     int credit[5];
11     int rate;
12 };
13
14 int fee(struct Student *s, int n) {
15     if(n==0) {
16         return 0;
17     }
18     return fee(s,n-1) + s->credit[n-1] * 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.
```