

Aufgabenblatt 5: Gleitkommazahlen

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Aufgabe 1 – Zinseszinstabelle

```
1  #include<stdio.h>
2  #include<math.h>
3
4  int main(void) {
5      double capital, interest_rate;
6      int years;
7      printf("Startkapital in EUR: "); scanf("%lf", &capital);
8      printf("Zinssatz in Prozent: "); scanf("%lf", &interest_rate);
9      printf("Laufzeit in Jahren: "); scanf("%d", &years);
10
11     printf("-----\n");
12     printf("    Jahr\t    Kapital in EUR\t\n");
13     printf("-----\n");
14     for (int i = 1; i <= years; i++) {
15         double current_capital = capital * pow((1 + (interest_rate / 100)), i);
16         printf("|  %d\t | %.2lf\t\t|\n", i, current_capital);
17     }
18     printf("-----\n");
19     return 0;
20 }
```

Aufgabe 2 – Flächeninhalt eines Dreiecks

```
1  #include<stdio.h>
2  #include<math.h>
3
4  struct vector2d {
5      float x;
6      float y;
7  };
8
9  int main(){
10     struct vector2d p1, p2, p3;
11     printf("Punkt 1 eingeben: "); scanf("%f %f", &p1.x, &p1.y);
12     printf("Punkt 2 eingeben: "); scanf("%f %f", &p2.x, &p2.y);
13     printf("Punkt 3 eingeben: "); scanf("%f %f", &p3.x, &p3.y);
14
15     struct vector2d a = { p1.x - p2.x, p1.y - p2.y };
16     struct vector2d b = { p1.x - p3.x, p1.y - p3.y };
17
18     float area = (a.x * b.y - a.y * b.x) / 2;
19     printf("%f Flaecheneinheiten\n", fabs(area));
20
21     return 0;
22 }
```

Aufgabe 3 – Trainingsdaten

```
1  #include<stdio.h>
2  #include<math.h>
3
4  int main() {
5      int jump_counter = 0;
6      float biggest, second_biggest, smallest, average;
7
8      printf("Sprungdaten eingeben:\n");
9      while (1) {
10         float x;
11         scanf("%f", &x);
12         if (x <= 0)
13             break;
14         average = ((average * jump_counter) + x) / (jump_counter + 1);
15         if (jump_counter == 0) {
16             biggest = x;
17             smallest = x;
18             second_biggest = x;
19         }
20         if (x > biggest) {
21             second_biggest = biggest;
22             biggest = x;
23         }
24         if (x < smallest)
25             smallest = x;
26         jump_counter++;
27     }
28
29     printf("Anzahl Spruenge: %d\n", jump_counter);
30     printf("Groesste Weite: %.2f\n", biggest);
31     printf("Zweitgroesste Weite: %.2f\n", second_biggest);
32     printf("Kleinste Weite: %.2f\n", smallest);
33     printf("Mittlere Weite: %.2f\n", average);
34     printf("Differenz der groessten und kleinsten Weite: %.2f\n", fabs(biggest
        - smallest));
35
36     return 0;
37 }
```