

CS-114 Fundamentals of programming

Instructor
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Assignment of manual 1 & 2

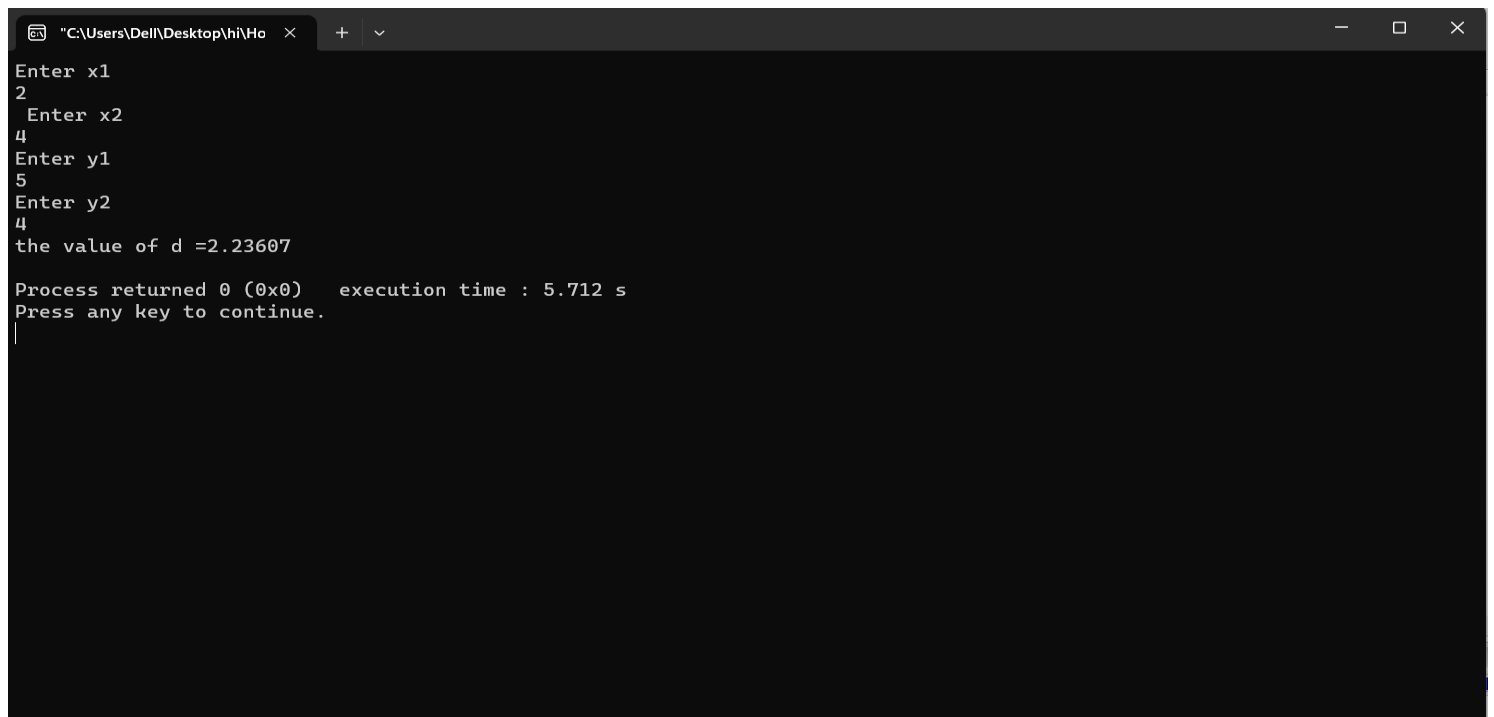
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Manual 1

QUESTION 1

```
6 // Question 1:Write a C++ program to calculate distance between two points. The values of coordinates should be input by user. D= sqrt((x2 -x1)*(x2-x1) + (y2-y1)*(y2-y1)).
7
8
9 #include <iostream>
10 #include <cmath> //Library used for sqrt function
11
12 using namespace std;
13
14 int main()
15 {
16     float x1, x2, y1, y2,d ; //declaring variables
17
18     //Input value for the user
19     cout<< "Enter x1" << endl;
20     cin>> x1;
21     cout<<" Enter x2" << endl;
22     cin>> x2;
23     cout<< "Enter y1" << endl;
24     cin>> y1;
25     cout<< "Enter y2" << endl;
26     cin>> y2;
27
28     // Applying the distance formula
29     d= sqrt((x2 - x1)*(x2-x1) + (y2-y1)*(y2-y1));
30
31     //Display the result
32     cout<<"the value of d =" <<d << endl;
33
34     return 0;
35
36
37
38 }
```

ANSWER 1



The screenshot shows a Windows command prompt window with the title bar "C:\Users\De\l\Desktop\h\Ho". The window contains the following text:

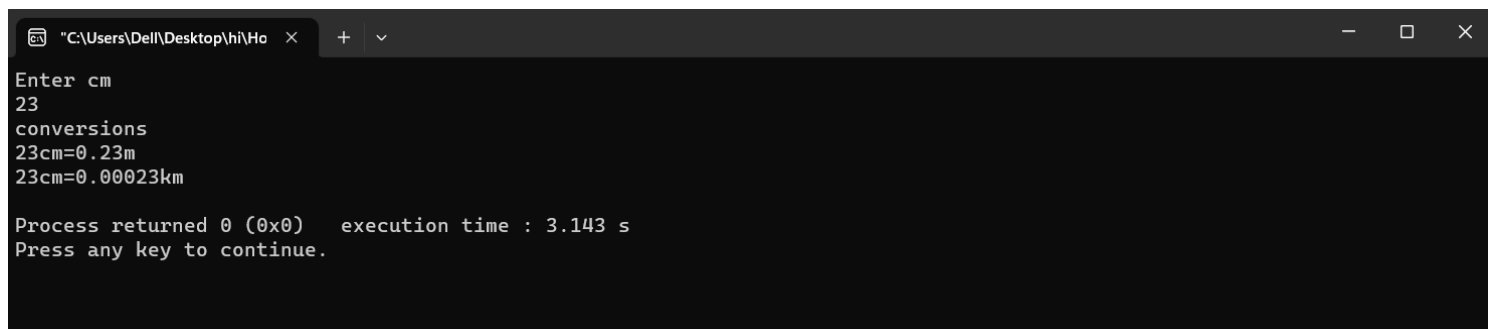
```
Enter x1
2
Enter x2
4
Enter y1
5
Enter y2
4
the value of d =2.23607

Process returned 0 (0x0)   execution time : 5.712 s
Press any key to continue.
|
```

QUESTION 2

```
45 // Question 2:Write a code in C++ to take length from user in centimeter and convert it into meter and kilometer.
46
47 #include <iostream>
48
49 using namespace std;
50
51 int main()
52 {
53     float cm,m,km ; //declaring variables
54
55     //Input value for the user
56     cout << "Enter cm" << endl;
57     cin>> cm;
58
59     // Converting m & km to cm
60     m= cm / 100.0;
61     km= cm/100000.0;
62
63     //Display the results
64     cout << "conversions" << endl;
65     cout << cm << "cm=" << m << "m" << endl;
66     cout << cm << "cm=" << km << "km" << endl;
67
68     return 0;
69
70
71 }
```

ANSWER 2



```
Enter cm
23
conversions
23cm=0.23m
23cm=0.00023km

Process returned 0 (0x0)   execution time : 3.143 s
Press any key to continue.
```

QUESTION 3

```
75 // Question 3:Write a code in C++ that takes values of a and b from the user and displays result of polynomial a^2 + 2ab + b^2.
76
77
78 #include<iostream>
79
80 using namespace std;
81
82 int main()
83 {
84     float a,b; //declaring variables
85
86     //Input value for the user
87     cout<< "Enter the value a=" << endl;
88     cin >> a;
89
90     cout<< "Enter the value b=" << endl;
91     cin>> b;
92
93     //applying the polynomial formula
94
95     float result = a*a + 2*a*b + b*b;
96
97     //Display the results
98     cout << "Result of the polynomial a^2 + 2ab + b^2 =" << result<< endl;
99
100     return 0;
101 }
102
...
```

ANSWER 3

```
"C:\Users\Dell\Desktop\hi\Ho x + v - □ ×
Enter the value a=
3
Enter the value b=
3
Result of the polynomial a^2 + 2ab + b^2 =36

Process returned 0 (0x0)   execution time : 3.668 s
Press any key to continue.
```

QUESTION 4

```
105 // Question 4:Write a program in C++ to convert temperature in Fahrenheit to Celsius.
106
107 #include <iostream>
108
109 using namespace std;
110
111 int main()
112 {
113     float F, C; //declaring variables
114
115     //Input value for the user
116     cout << "Enter temperature in Fahrenheit=" << endl;
117     cin >> F;
118
119     //Applying formula to convert Fahrenheit to Celsius
120
121     C = (F - 32) * 5/9;
122
123     //Display the results
124     cout << "conversion" << endl;
125     cout << F << "F=" << C << "C=" << endl;
126
127     return 0;
128
129
130 }
```

ANSWER 4

```
"C:\Users\Dell\Desktop\hi\Ho x + v - □ ×
Enter temperature in Fahrenheit=
555
conversion
555F=290.556C=

Process returned 0 (0x0)   execution time : 2.846 s
Press any key to continue.
```

Manual 2

QUESTION 1

```
133 //Manual 2:
134
135 //Question 1: 1. Write a program that determines if a person is eligible to vote based on their age (e.g., 18 years or older) using logical operators.
136
137 #include <iostream>
138
139 using namespace std; // Add this line
140
141 int main() {
142     int age;
143
144     // Prompt the user to enter their age
145     cout << "Enter your age: ";
146     cin >> age;
147
148     // Check if the person is eligible to vote
149     if (age >= 18) {
150         cout << "You are eligible to vote.\n";
151     } else {
152         cout << "You are not eligible to vote.\n";
153     }
154
155     return 0;
156 }
```

ANSWER 1

```
"C:\Users\De\l\Desktop\h\Ho" x + v
Enter your age: 43
You are eligible to vote.

Process returned 0 (0x0)   execution time : 1.825 s
Press any key to continue.
```

QUESTION 2

```
159 //Question 2: Write a program that takes an integer as input and checks if it falls within the range [10, 50] using logical operators
160
161 #include <iostream>
162
163 using namespace std;
164
165 int main() {
166     int number;
167
168     // Prompt the user to enter an integer
169     cout << "Enter an integer: ";
170     cin >> number;
171
172     // Check if the number falls within the range [10, 50]
173     if (number >= 10 && number <= 50) {
174         cout << "The number is within the range [10, 50].\n";
175     } else {
176         cout << "The number is outside the range [10, 50].\n";
177     }
178
179     return 0;
180 }
```

ANSWER 2

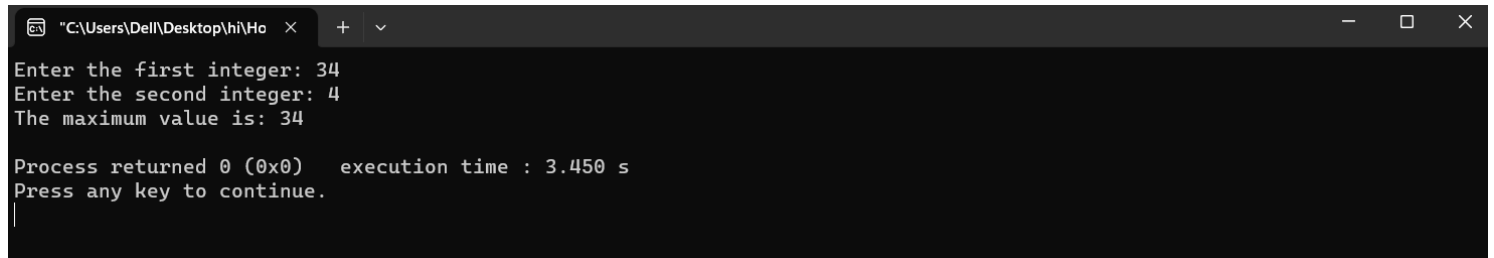
```
"C:\Users\De\l\Desktop\h\Ho" x + v
Enter an integer: 35
The number is within the range [10, 50].

Process returned 0 (0x0)   execution time : 2.279 s
Press any key to continue.
```

QUESTION 3

```
183 //Question 3: Write a C++ program to compare two integers and find the maximum value.
184
185 #include <iostream>
186
187 using namespace std;
188
189 int main() {
190     int num1, num2;
191
192     // Prompt the user to enter two integers
193     cout << "Enter the first integer: ";
194     cin >> num1;
195     cout << "Enter the second integer: ";
196     cin >> num2;
197
198     int maxNumber;
199
200     if (num1 > num2) {
201         maxNumber = num1;
202     } else {
203         maxNumber = num2;
204     }
205
206     cout << "The maximum value is: " << maxNumber << endl;
207
208     return 0;
209 }
```

ANSWER 3



```
"C:\Users\Dell\Desktop\hi\Ho x" + v
Enter the first integer: 34
Enter the second integer: 4
The maximum value is: 34

Process returned 0 (0x0)   execution time : 3.450 s
Press any key to continue.
|
```

QUESTION 4

```
212 //Question 4: Write a C++ program to calculate the average of three exam scores and determine if it's above a passing grade (e.g., average >= 60)
213
214 #include <iostream>
215
216 using namespace std;
217
218 int main() {
219     float score1, score2, score3;
220     float average;
221
222     // Prompt the user to enter three exam scores
223     cout << "Enter the first exam score: ";
224     cin >> score1;
225     cout << "Enter the second exam score: ";
226     cin >> score2;
227     cout << "Enter the third exam score: ";
228     cin >> score3;
229
230     // Calculate the average score
231     average = (score1 + score2 + score3) / 3.0f; // Use 3.0f to ensure float division
232
233     // Determine if the average is above a passing grade (e.g., 60)
234     if (average >= 60.0f) {
235         cout << "Average score is " << average << " - You passed!\n";
236     } else {
237         cout << "Average score is " << average << " - You failed!\n";
238     }
239
240     return 0;
241 }
```

ANSWER 4

```
"C:\Users\ DELL\Desktop\hi\Ho  X + v
Enter the first exam score: 77
Enter the second exam score: 88
Enter the third exam score: 7
Average score is 57.3333 - You failed.

Process returned 0 (0x0)   execution time : 6.005 s
Press any key to continue.
```

QUESTION 5

```
244 //Question 5: Create a program that takes a student's score as input and assigns a grade based on predefined criteria using logical operators (e.g., A, B, C, D, F). A-Grade: 90-100 Marks B-Grade: 75-90 Marks C-Grade: 60-75 Marks D-Grade: 45-60 Marks F-Grade: 0-45 Marks
245
246 #include <iostream>
247
248 using namespace std;
249
250 int main() {
251     int score;
252
253     // Prompt the user to enter the student's score
254     cout << "Enter the student's score: ";
255     cin >> score;
256
257     char grade;
258
259     if (score >= 90) {
260         grade = 'A';
261     } else if (score >= 75) {
262         grade = 'B';
263     } else if (score >= 60) {
264         grade = 'C';
265     } else if (score >= 45) {
266         grade = 'D';
267     } else {
268         grade = 'F';
269     }
270
271     cout << "The student's grade is: " << grade << endl;
272
273     return 0;
274 }
```

ANSWER 5

```
"C:\Users\ DELL\Desktop\hi\Ho  X + v
Enter the student's score: 77
The student's grade is: B

Process returned 0 (0x0)   execution time : 2.522 s
Press any key to continue.
```

QUESTION 6

```
277 //Question 6: Write a program that takes an integer as input and determines if it is both even and divisible by 5.
278
279 #include <iostream>
280
281 using namespace std;
282
283 int main() {
284     int number;
285
286     // Prompt the user to enter an integer
287     cout << "Enter an integer: ";
288     cin >> number;
289
290     if (number % 2 == 0 && number % 5 == 0) {
291         cout << "The number is both even and divisible by 5.\n";
292     } else {
293         cout << "The number is not both even and divisible by 5.\n";
294     }
295
296     return 0;
297 }
```

ANSWER 6

```
"C:\Users\Dell\Desktop\hi\Ho" × + v
Enter an integer: 32
The number is not both even and divisible by 5.

Process returned 0 (0x0)   execution time : 2.393 s
Press any key to continue.
```

QUESTION 7

```
300 //Question 7: Create a C++ program that checks if a user-provided year is a leap year.
301
302 #include <iostream>
303
304 using namespace std;
305
306 int main() {
307     int year;
308
309     // Prompt the user to enter a year
310     cout << "Enter a year: ";
311     cin >> year;
312
313     if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
314         cout << year << " is a leap year.\n";
315     } else {
316         cout << year << " is not a leap year.\n";
317     }
318
319     return 0;
320 }
```

ANSWER 7

```
"C:\Users\Dell\Desktop\hi\Ho" × + v
Enter a year: 2000
2000 is a leap year.

Process returned 0 (0x0)   execution time : 4.830 s
Press any key to continue.
|
```


QUESTION 8

```
323 //Question 8: Create a C++ program that determines if a student is eligible for a scholarship based on their GPA (must have GPA >= 3.5) and attendance (must have attended at least 80% of classes)
324
325 #include <iostream>
326
327 using namespace std;
328
329 int main() {
330     float gpa;
331     float attendancePercentage;
332
333     // Prompt the user to enter GPA and attendance percentage
334     cout << "Enter your GPA: ";
335     cin >> gpa;
336     cout << "Enter your attendance percentage: ";
337     cin >> attendancePercentage;
338
339     if (gpa >= 3.5f && attendancePercentage >= 80.0f) { // "f" to ensure float comparisons
340         cout << "You are eligible for a scholarship.\n";
341     } else {
342         cout << "You are not eligible for a scholarship.\n";
343     }
344
345     return 0;
346 }
```

ANSWER 8

```
"C:\Users\De\l\Desktop\hi\Ho x + v
Enter your GPA: 3.9
Enter your attendance percentage: 88
You are eligible for a scholarship.

Process returned 0 (0x0)   execution time : 7.236 s
Press any key to continue.
```

QUESTION 9

```
349 //Question 9: Write a program that checks if a given character is a vowel (a, e, i, o, u) or a consonant using logical operators.
350
351 #include <iostream>
352
353 using namespace std;
354
355 int main() {
356     char character;
357
358     // Prompt the user to enter a character
359     cout << "Enter a character: ";
360     cin >> character;
361
362     // Check if the character is a vowel
363     if (character == 'a' || character == 'e' || character == 'i' || character == 'o' || character == 'u' ||
364         character == 'A' || character == 'E' || character == 'I' || character == 'O' || character == 'U') {
365         cout << character << " is a vowel.\n";
366     } else {
367         cout << character << " is a consonant.\n";
368     }
369
370     return 0;
371 }
```

ANSWER 9

```
"C:\Users\De\l\Desktop\hi\Ho x + v
Enter a character: R
R is a consonant.

Process returned 0 (0x0)   execution time : 8.888 s
Press any key to continue.
```