

cOMPUTING & AI

MidTerm– Fall 2023

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| Reg#: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| COURSE CODE: CS101 | INSTRUCTOR: Dr. Khurram Khan |
| Total Exam time: 1.00 | Maximum Marks: 45 |

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Instructions

* Properly write your name and registration number.
* All questions are mandatory.
* Understanding the question is part of the exam.
* Cutting is not allowed in multiple-choice questions.
* Please consider class discussions and demonstrations before answering the questions.

For Examiner use only

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| --- | --- | --- | --- |
| Question# | 1 | 2 | Total |
| Marks | 31 | 14 | 45 |
| Obtained Marks |  |  |  |

Prepared By: Dr. Khurram Khan

Vetted By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approved By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Question # 1: Answer the following questions. (CLO2, PLO1) (31 Marks)

1. Analyze the code snippets and write the values of the requested variables in the corresponding boxes. (23 Marks)

int x=1;

cout << (x>=60 ? “p”;”F”);

*Code Snippet*

F

*Output*

int x = 4; int y =4;

int z = (--x) - (y++);

Cout<< "\n x = "<< x;

Cout<<"\n y = "<< y;

Cout<<"\n z= "<< z;

*Code Snippet*

x = 3

y = 5

z= -1

*Output*

int x= 5, y=2;

Cout << x + y \*2 % 9 – 9;

*Code Snippet*

0

*Output*

int x=1;

while (x <= 6) {

if (x % 3 == 0) {

cout << x << endl;

}

else {

cout << x << '\t';

}

++x;}

*Code Snippet*

1 2 3

4 5 6

*Output*

double a = 1.67;

int b = (int)a + a ;

*Code Snippet*

2

*Output*

int x =10;

int y=1;

do{

y++;

}

while (x !=10 && x/10==0);

cout << y;

*Code Snippet*

2

*Output*

#include <iostream>

using std::cout;

int main() {

int x= 1;

switch(x)

{

case 1:

case 2:

cout<<"case2";

break;

case 3:

cout<<"case3";

break;

case 4:

default:

cout<<" final case";

}

return 0;

}

*Code Snippet*

case2

*Output*

int a, b;

a = 2;

b = a \* 2 + 1;

a -= 1;

*Code Snippet*

value of a:1

value of b:5

*Output*

x = 99;

if (x++ < 100)

cout << "It is true!\n";

else

cout << "It is false!\n";

*Code Snippet*

It is true

*Output*

for (int i = 1; i <= 2; i++ ) {

cout << "#";

for ( int j = 1; j <= 2; j++ ) {

cout << '@';

}

cout << "#"<<endl;

}

*Code Snippet*

#@@#

#@@#

*Output*

1. Carefully analyze the following code snippets and identify the syntax or logical (including hidden) errors. Additionally, for any logical errors detected, classify them as fatal or non-fatal errors. Please note that to find hidden errors you must understand the working of these code snippets. (8 Marks)
2. #include <iostream>
3. using namespace std
4. int main (){
5. int i = 0;
6. if (i < = 5)
7. {
8. cout<< “inside if”;
9. else
10. {
11. cout<< “inside else”;
12. }
13. }
14. cout<< “outside” <<endl;
15. return “0”;
16. }

*Code Snippet*

*Errors*

1. #include <iostream>
2. using namespace std
3. int main() {
4. int x, y;
5. cout << "Enter value for x: ";
6. cin >> x;
7. cout << "Enter a value for y: "
8. cin >> y;
9. int result = x / y;
10. cout << "The result of x / y is: " << result << endl;
11. return 0
12. }

*Code Snippet*

*Errors*

Question # 3: Write a C++ program that inputs a number from the user and saves it in a variable X (of int type). Afterward, your code should take X numbers from the user (e.g., if X= 10, the program will take 10 numbers as input from the user). Once all the X numbers are provided as input, your program should display the following information: (CLO2, PLO1) (14 Marks)

1. Largest number among the X numbers entered by the user.
2. Smallest number among the X numbers entered by the user.
3. Average the X numbers entered by the user.

Make sure to declare variables of an appropriate type where needed.

*[Hint]*:Begin by outlining the algorithm in plain English as your initial plan and then proceed to implement it using relevant C++ statements.

Solution

#include <iostream>

using namespace std;

int main() {

int X;

int largest, smallest, num;

double sum = 0.0;

// Input the number X

cout << "Enter the value of X: ";

cin >> X;

// negative numbers discard

if (X <= 0) {

cout << "X should be a positive integer." << endl;

return 1; // Exit with an error code

}

cout << "Enter number 1: ";

cin >> num;

largest = smallest = num;

sum = num;

// Input the rest of the X numbers and update largest, smallest, and sum

for (int i = 2; i <= X; ++i) {

cout << "Enter number " << i << ": ";

cin >> num;

if (num > largest) {

largest = num;

}

if (num < smallest) {

smallest = num;

}

sum += num;

}

// Calculate and display the average

double average = sum / X;

cout << "Largest number: " << largest << std::endl;

cout << "Smallest number: " << smallest << std::endl;

cout << "Average: " << average << std::endl;

return 0;

}