



# Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Final Examination, Fall 2025

Course Code: CSE113, Course Title: Programming and Problem Solving

Level: 1 Term: 2 Batch: 69

Time: 02:00 Hrs

Marks: 40

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1. | Identify the errors in the following code? Explain the errors and reasons why you think they are errors.                                                                                                                                                                                                                                                                                                                                                                                                           | CO2<br>03      |
|    | <p>a)</p> <pre> 1. #include &lt;stdio.h&gt; 2. void increaseScores(int *arr, int n*) { 3.     for(int i = 0; i &lt;= n; i++) { 4.         *arr[i] = arr[i] + 5; 5.     } 6. } 7. int findMin(int *p, int *q) { 8.     if(p &gt; *q) 9.         return q; 10.    return *p; 11. } 12. int main() { 13.    int scores[3] = {10, 20, 30}; 14.    increaseScores(scores, 3); 15.    int result = findMin(&amp;scores[0] &amp;scores[2]); 16.    printf("Minimum score is: %d\n", result); 17.    return 0; 18. }</pre> |                |
|    | b) Rewrite the code without any errors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 03             |
| 2. | Generate the output of given codes below (write only the output segment in a box):                                                                                                                                                                                                                                                                                                                                                                                                                                 | CO3<br>03 + 03 |
|    | <p>a)</p> <pre> #include &lt;stdio.h&gt; int main() {     int numbers[3] = {4, 7, 2};     for(int i = 0; i &lt; 3; i++) {         if(numbers[i] % 2 == 0)             printf("%d is even\n", numbers[i]);         else             printf("%d is odd\n", numbers[i]);         if(numbers[i] &gt; 5)             printf("%d is greater than 5\n", numbers[i]);         else             printf("%d is not greater than 5\n", numbers[i]);     }     return 0; }</pre>                                               |                |
|    | <p>b)</p> <pre> #include &lt;stdio.h&gt; #include &lt;ctype.h&gt; #include &lt;string.h&gt; void modify (char *s1, char *s2) {     char temp = *s1;     *s1 = *s2;     *s2 = temp;     char *p1 = s1 + strlen(s1) - 1;     *p1 = toupper(*p1);     char *p2 = s2 + 1;     *p2 = tolower(*p2);     char *p3 = s1 + 2;     *p3 = '#'; } int main() {</pre>                                                                                                                                                           |                |

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |               |          |             |              |               |            |           |    |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|----------|-------------|--------------|---------------|------------|-----------|----|
|              | <pre>char str1[50] = "Apple"; char str2[50] = "BANANA"; modify (str1, str2); printf("str1 = %s\n", str1); printf("str2 = %s\n", str2); printf("Sum of lengths = %d\n", strlen(str1) + strlen(str2)); return 0; }</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |               |          |             |              |               |            |           |    |
| c)           | <pre>#include &lt;stdio.h&gt; struct Student {     char name[20];     int marks; }; void bonus(struct Student *s) {     if (s-&gt;marks &gt;= 50)         s-&gt;marks += 5;     else         s-&gt;marks += 2; } int main() {     struct Student s[3] = {"Ali", 45}, {"Sara", 52};     for(int i = 0; i &lt; 2; i++)         bonus(&amp;s[i]);     for(int i = 0; i &lt; 2; i++)         printf("%s %d\n", s[i].name, s[i].marks);     printf("Total marks = %d\n", s[0].marks + s[1].marks);     printf("Average marks = %.2f\n", (s[0].marks + s[1].marks)/3.0);     return 0; }</pre> <p style="text-align: right;"><del>47</del><br/><del>57</del><br/><math>(47 + 57) / 3</math></p>                                                                                                                                                                                                                                                                                  | 03           |               |          |             |              |               |            |           |    |
| 3.           | Identify the problem scenarios given below and write a complete C program for each problem statement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |               |          |             |              |               |            |           |    |
| a)           | <p>During the DIU CSE Lab Recruitment Drive, each student submits an <i>interest tag</i> (a single word) that describes their primary area of interest (e.g., "coding", "robotics", "ai"). You must check whether the tag contains any digits. If it contains even one digit, the tag is considered invalid. Write a C program that reads the tag and prints whether it is valid or not.</p> <p><b>Input:</b></p> <ul style="list-style-type: none"><li>One line containing the interest tag (a string without spaces)</li></ul> <p><b>Output:</b></p> <ul style="list-style-type: none"><li>Print "Valid Tag" if the tag contains <b>no</b> digits</li><li>Print "Invalid Tag" if <b>any</b> digit is found</li></ul> <table border="1" style="width: 100%;"><tr><td>Sample Input</td><td>Sample Output</td></tr><tr><td>coding32</td><td>Invalid Tag</td></tr><tr><td>Sample Input</td><td>Sample Output</td></tr><tr><td>kamonachan</td><td>Valid Tag</td></tr></table> | Sample Input | Sample Output | coding32 | Invalid Tag | Sample Input | Sample Output | kamonachan | Valid Tag | 05 |
| Sample Input | Sample Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              |               |          |             |              |               |            |           |    |
| coding32     | Invalid Tag                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |               |          |             |              |               |            |           |    |
| Sample Input | Sample Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              |               |          |             |              |               |            |           |    |
| kamonachan   | Valid Tag                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |               |          |             |              |               |            |           |    |
| b)           | <p>Each applicant rates themselves in 5 skill categories on a scale from 1 to 10. You are given an array of integers representing these skill ratings. Write a <b>recursive function</b> in C to print the entire array in reverse order.</p> <p><b>Input:</b></p> <ul style="list-style-type: none"><li>First line contains an integer <b>n</b> representing the number of skill ratings</li><li>Second line contains <b>n</b> space-separated integers</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 05           |               |          |             |              |               |            |           |    |

| <b>Output:</b> <ul style="list-style-type: none"><li>Print the ratings in reverse order (space-separated)</li></ul>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |                |                                    |                                                         |              |               |       |                |    |
|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|------------------------------------|---------------------------------------------------------|--------------|---------------|-------|----------------|----|
| <table><tr><th>Sample Input</th><th>Sample Output</th></tr><tr><td>5<br/>3 7 8 6 9</td><td>9 6 8 7 3</td></tr></table> | Sample Input                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sample Output | 5<br>3 7 8 6 9 | 9 6 8 7 3                          |                                                         |              |               |       |                |    |
| Sample Input                                                                                                           | Sample Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                |                                    |                                                         |              |               |       |                |    |
| 5<br>3 7 8 6 9                                                                                                         | 9 6 8 7 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |                |                                    |                                                         |              |               |       |                |    |
| c)                                                                                                                     | <p>A lab conducted a screening quiz where each student was evaluated in three categories:</p> <ul style="list-style-type: none"><li><b>Problem Solving</b></li><li><b>Logic</b></li><li><b>Debugging</b></li></ul> <p>The scores of all students are stored as a 2D array of integers (each row represents a student). A student qualifies if:</p> <ul style="list-style-type: none"><li><b>Problem Solving <math>\geq 7</math> AND (Logic <math>\geq 6</math> OR Debugging <math>\geq 6</math>)</b></li></ul> <p>Write a C program that prints the score table and then prints the indices of all qualified students.</p> <p><b>Input:</b></p> <ul style="list-style-type: none"><li>First line contains an integer n (number of students)</li><li>Next n lines each contain three integers: Problem Solving, Logic, Debugging scores</li></ul> <p><b>Output:</b></p> <ul style="list-style-type: none"><li>Print the score table (one row per student)</li><li>Print: "Qualified: index" for each qualified student</li></ul> <table><tr><th>Sample Input</th><th>Sample Output</th></tr><tr><td>3<br/>7 5 6-P<br/>8 7 4-L<br/>6 6 6-D</td><td>7 5 6<br/>8 7 4<br/>6 6 6<br/>Qualified: 0<br/>Qualified: 1</td></tr></table> | Sample Input  | Sample Output  | 3<br>7 5 6-P<br>8 7 4-L<br>6 6 6-D | 7 5 6<br>8 7 4<br>6 6 6<br>Qualified: 0<br>Qualified: 1 | 05           |               |       |                |    |
| Sample Input                                                                                                           | Sample Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                |                                    |                                                         |              |               |       |                |    |
| 3<br>7 5 6-P<br>8 7 4-L<br>6 6 6-D                                                                                     | 7 5 6<br>8 7 4<br>6 6 6<br>Qualified: 0<br>Qualified: 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |                |                                    |                                                         |              |               |       |                |    |
| d)                                                                                                                     | <p>As part of a creativity task, students submit a codename (a single word). Write a user-defined function that receives this codename and returns:</p> <ul style="list-style-type: none"><li>1 if the codename is a palindrome</li><li>0 otherwise</li></ul> <p>Use the function to determine and print whether the codename is a <b>palindrome</b>. A <b>palindrome</b> is any sequence of characters that reads the same forward and backward (e.g., noon, 1001). Palindromes can be words, phrases, numbers, or names.</p> <p><b>Input:</b></p> <ul style="list-style-type: none"><li>One line containing a codename (a string without spaces)</li></ul> <p><b>Output:</b></p> <ul style="list-style-type: none"><li>Print "Palindrome" or "Not Palindrome"</li></ul> <table><tr><th>Sample Input</th><th>Sample Output</th></tr><tr><td>level</td><td>Palindrome</td></tr></table> <table><tr><th>Sample Input</th><th>Sample Output</th></tr><tr><td>label</td><td>Not Palindrome</td></tr></table>                                                                                                                                                                                                                      | Sample Input  | Sample Output  | level                              | Palindrome                                              | Sample Input | Sample Output | label | Not Palindrome | 05 |
| Sample Input                                                                                                           | Sample Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                |                                    |                                                         |              |               |       |                |    |
| level                                                                                                                  | Palindrome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |                |                                    |                                                         |              |               |       |                |    |
| Sample Input                                                                                                           | Sample Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                |                                    |                                                         |              |               |       |                |    |
| label                                                                                                                  | Not Palindrome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |                |                                    |                                                         |              |               |       |                |    |

e) Define a structure Applicant with the following fields: 05

- ID (int)
- Name (string without spaces)
- Event (string without spaces)
- Cleared (1 = cleared screening, 0 = not cleared)

Write a C program to input details of n applicants and store them in an array of structures. Print the details of applicants who: have cleared = 1 and belong to the "coding" event.

**Input:**

- First line contains integer n
- Next n blocks each contain:
  - Applicant ID
  - Name
  - Event
  - Cleared (1 or 0)

**Output:**

- Print details in this format:

ID: <ID> Name: <Name> Event: <Event> Status: Cleared

| Sample Input | Sample Output                                    |
|--------------|--------------------------------------------------|
| 3            | ID: 101 Name: Rafi Event: coding Status: Cleared |
| 101          |                                                  |
| Rafi         |                                                  |
| coding       |                                                  |
| 1            |                                                  |
| 102          |                                                  |
| Sadia        |                                                  |
| robotics     |                                                  |
| 1            |                                                  |
| 103          |                                                  |
| Imran        |                                                  |
| coding       |                                                  |
| 0            |                                                  |