

Course Code: CS-118	Course Name: Programming Fundamentals
Instructor Name / Names: Ms. Atiya Jokhio	

Instructions:

- Attempt all the questions
- Don't share your work, if your submission is matched to any member of your class, both will be marked 0 straight without asking who shared or who magically copied.
- You have to submit all questions (Q#1 to Q#5) in soft copy having (.c) files on a Google Classroom till Monday i.e. 14th December, 2020 up to 11:59 pm.
- V.va will be conducted from submitted assignment.
- No late submissions will be accepted.

Max Marks: 50 Points

Question: 1

A small airline has just purchased a computer for its new automated reservations system. The president has asked you to program the new system. You'll write program to assign seats on each flight of the airline's only plane (capacity: 10 seats). Your program should display the following menu of alternatives: Please type 1 for "first class" Please type 2 for "economy" If the person types 1, then your program should assign a seat in the first class section (seats 1–5). If the person types 2, then your program should assign a seat in the economy section (seats 6–10). Your program should then print a boarding pass indicating the person's seat number and whether it's in the first class or economy section of the plane. Use a single-subscripted array to represent the seating chart of the plane. Initialize all the elements of the array to 0 to indicate that all seats are empty. As each seat is assigned, set the corresponding element of the array to 1 to indicate that the seat is no longer available. Your program should, of course, never assign a seat that has already been assigned. When the first class section is full, your program should ask the person if it's acceptable to be placed in the economy section (and vice versa). If yes, then make the appropriate seat assignment. If no, then print the message "Next flight leaves in 3 hours."

Question: 2

A palindrome is a string that's spelled the same way forward and backward. Some examples of palindromes are: "radar," "able was i ere i saw elba," and, if you ignore blanks, "a man a plan a canal panama." Write a recursive function testPalindrome that returns 1 if the string stored in the array is a palindrome and 0 otherwise. The function should ignore spaces and punctuation in the string.

Question: 3

Implement the following procedure to generate prime numbers from 1 to 100 into a program. This procedure is called sieve of Eratosthenes.

step 1 Fill an array num [100] with numbers from 1 to 100

step 2 Starting with the second entry in the array, set all its multiples to zero.

step 3 Proceed to the next non-zero element and set all its multiples to zero.

step 4 Repeat step 3 till you have set up the multiples of all the non-zero elements to zero

step 5 At the conclusion of step 4, all the non-zero entries left in the array would be prime numbers, so print out these numbers.

Instruction: Attempt the question # 4 & 5 by all methods described below:

1. 2d array
2. pointer to 2d arrays
3. design function for calculating the results by passing array to function by reference.

Question: 4

The results from the mayor's race have been reported by each precinct as follows:

Precinct	Candidate A	Candidate B	Candidate C	Candidate D
1	192	48	206	37
2	147	90	312	21
3	186	12	121	38
4	114	21	408	39
5	267	13	382	29

Display the table with appropriate labels for the rows and columns.

- b) Compute and display the total number of votes received by each candidate and the percentage of the total votes cast.
- c) If any one candidate received over 50 percent of the votes, the program should display a message declaring that candidate the winner.
- d) If no candidate received 50 percent of the votes, the program should display a message declaring a runoff between the two candidates receiving the highest number of votes; the two candidates should be identified by their letter names.(e.g. candidates 'A' and 'C' received highest votes)

e) Run the program once with the data shown and once with candidate C receiving only 108 votes in Precinct 4.

Question: 5

The area of a triangle can be computed by the sine law

$$Area = \left(\frac{1}{2}\right) ab \sin(angle)$$

write a program to find their area of given 6 plot values and determine which is largest.

Plot No.	a	b	angle
1	137.4	80.9	0.78
2	155.2	92.62	0.89
3	149.3	97.93	1.35
4	160.0	100.25	9.00
5	155.6	68.95	1.25
6	149.7	120.0	1.75