

Enunț

Creați o aplicație pentru gestiunea concurenților de la un concurs de programare. Programul înregistrează scorul obținut de fiecare concurent la 10 probe diferite, fiecare probă este notat cu un scor de la 1 la 10. Fiecare participant este identificat printr-un număr de concurs, scorul este ținut într-o listă unde concurentul 3 are scorul pe poziția 3 în listă. Programul trebuie să ofere următoarele funcționalități:

1. Adaugă un scor la un participant.

- Adaugă scor pentru un nou participant (ultimul participant)
- Inserare scor pentru un participant.

2. Modificare scor.

- Șterge scorul pentru un participant dat.
- Șterge scorul pentru un interval de participanți.
- Înlocuiește scorul de la un participant.

3. Tipărește lista de participanți.

- Tipărește participanții care au scor mai mic decât un scor dat.
- Tipărește participanții ordonat după scor
- Tipărește participanții cu scor mai mare decât un scor dat, ordonat după scor.

4. Operații pe un subset de participanți.

- Calculează media scorurilor pentru un interval dat (ex. Se da 1 și 5 se tipărește media scorurilor participanților 1,2,3,4 și 5)
- Calculează scorul minim pentru un interval de participanți dat.
- Tipărește participanții dintr-un interval dat care au scorul multiplu de 10.

5. Filtrare.

- Eliminare participanți care au scorul multiplu unui număr dat. Ex. Se da numărul 10, se elimină scorul de la toți participanții care nu au scorul multiplu de 10.
- Eliminare participanți care au scorul mai mic decât un scor dat.

6. Undo

- Reface ultima operație (lista de scoruri revine la numerele ce existau înainte de ultima operație care a modificat lista) – **Nu folosiți funcția deepCopy**

Listă de funcționalități

Număr	Descriere funcție
F1	Adăugarea scorului unui nou participant
F2	Inserare scor participant

Număr	Descriere funcție
F3	Șterge scorul unui participant
F4	Șterge scorul unui interval de participanți
F5	Schimbă scorul unui participant
F6	Printează participanții cu scor mai mic decât un scor dat
F7	Printează participanții ordonați după scor
F8	Printează participanții cu scor mai mic decât un scor dat, ordonați după scor
F9	Calculează media scorurilor pentru un interval dat
F10	Calculează scorul minim pentru un interval dat
F11	Tipărește participanții dintr-un interval dat cu scor multiplu de 10
F12	Filtrează participanții cu scor multiplu de un scor dat
F13	Filtrează participanții cu scor mai mic decât un scor dat
F14	Reface ultima operație asupra listei

Plan de iterații

Prima iterație:

Vom implementa meniul programului, logica principală și documentația acestuia. Cerințele realizate vor fi 1 și 3, adică funcționalitățile F1, F2, F6, F7 și F8.

A doua iterație:

Adăugăm funcționalități noi pentru a rezolva cerințele 2 și 5, adică funcționalitățile F3, F4, F5, F9, F13, F14. În culise, reorganizăm codul pentru a ne fi mai ușor să adăugăm feature-uri noi.

A treia iterație:

Rafinăm codul și implementăm cerințele rămase: 4 și 6, funcționalitățile F9, F10, F11, F14.

Scenarii de rulare

F1 : Adăugarea scorului unui nou participant

User Input	Program output	Description
	Application Menu	Program prints main menu
1		User chooses the add submenu

User Input	Program output	Description
	Add submenu	Program prints the add submenu
1		User chooses to add score of a new participant
	Task input dialog	Program asks user to enter the task for the score addition (1-10)
a		User enters a bad input
	Invalid input warning. Task input dialog	Program doesn't accept the input and asks for it again
1		User chooses task 1
	Score input dialog	Program asks user to enter the score (1-10)
12		User enters a bad input
	Invalid input warning. Score input dialog	Program doesn't accept the input and asks for it again
4		User chooses 4 as score
	Operation successful. Participant 4 now has score	Confirms the operation was successful and prints the current score for the last participant
	Add submenu	Program prints the add submenu

F2 : Inserare scor participant

User Input	Program output	Description
	Application Menu	Program prints main menu
1		User chooses the add submenu
	Add submenu	Program prints the add submenu
2		User chooses to add score of an existing participant
	Participant input dialog	Program asks user to enter the participant number (eg 1-3)
44		User enters a bad input
	Invalid input warning. Participant input dialog	Program doesn't accept the input and asks for it again
3		User chooses participant 3
	Task input dialog	Program asks user to enter the task for the score addition (1-10)
1		User chooses task 1

User Input	Program output	Description
	Score input dialog	Program asks user to enter the score (1-10)
4		User chooses 4 as score
	Operation successful. Participant 3 now has score ...	Confirms the operation was successful if the participant didn't have a score set for the task and prints the current score for participant 3
<i>or</i>		
	Error. Participant already has a score for that task	Program prints error message as the operation failed because the participant already had a score for that task
	Add submenu	Program prints the add submenu

F3 : Șterge scorul unui participant

User Input	Program output	Description
	Application Menu	Program prints main menu
2		User chooses the modify submenu
	Modify submenu	Program prints the modify submenu
1		User chooses to remove the score of an existing participant
	Participant input dialog	Program asks user to enter the participant number (eg 1-3)
3		User chooses participant 3
	Task input dialog	Program asks user to enter the task for the score modification (1-10)
1		User chooses task 1
	Operation successful. Participant 3 now has score ...	Confirms the operation was successful if the participant had a score set for the task and prints the current score for participant 3
<i>or</i>		
	Error. Operation failed	Program prints error message as the operation failed because the participant didn't have a score for that task
	Add submenu	Program prints the modify submenu

F4 : Șterge scorul unui interval de participanți

User Input	Program output	Description
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User Input	Program output	Description
	Application Menu	Program prints main menu
2		User chooses the modify submenu
	Modify submenu	Program prints the modify submenu
2		User chooses to remove the score of an interval of participants
	Participant input dialog (left endpoint)	Program asks user to enter the participant number for the left end of the interval (eg 1-3)
2		User chooses participant 2 for the left end of the interval
	Participant input dialog (right endpoint)	Program asks user to enter the participant number for the right end of the interval (eg 1-3)
1		User chooses participant 1 for the right end of the interval, $1 < 2$
	Invalid input warning. Participant input dialog (left endpoint)	Program doesn't accept the input as it doesn't form an interval and asks for both endpoints again
2		User chooses participant 2 for the left end of the interval
	Participant input dialog (right endpoint)	Program asks user to enter the participant number for the right end of the interval (eg 1-3)
3		User chooses participant 3 for the right end of the interval, $3 > 2$
	Task input dialog	Program asks user to enter the task for the score modification (1-10)
1		User chooses task 1
	Operation successful. Participants 2-3 now have score ...	Confirms the operation was successful if the participant had a score set for the task and prints the current score for participants 2-4
<i>or</i>		
	Error. Operation failed	Program prints error message as the operation failed because one of the participants didn't have a score for that task
	Add submenu	Program prints the modify submenu

F5 : Schimbă scorul unui participant

User Input	Program output	Description
	Application Menu	Program prints main menu
2		User chooses the modify submenu

User Input	Program output	Description
	Modify submenu	Program prints the modify submenu
3		User chooses to modify the score of an existing participant
	Participant input dialog	Program asks user to enter the participant number (eg 1-3)
3		User chooses participant 3
	Task input dialog	Program asks user to enter the task for the score modification (1-10)
1		User chooses task 1
	Score input dialog	Program asks user to enter the score (1-10)
4		User chooses 4 as score
	Operation successful. Participant 3 now has score ...	Confirms the operation was successful if the participant had a score set for the task and prints the current score for participant 3
<i>or</i>		
	Error. Operation failed	Program prints error message as the operation failed because the participant didn't have a score for that task
	Add submenu	Program prints the modify submenu

F6 : Printează participanții cu scor mai mic decât un scor dat

User Input	Program output	Description
	Application Menu	Program prints main menu
3		User chooses the print submenu
	Print submenu	Program prints the print submenu
2		User chooses to print all participants with scores smaller than
	Task input dialog	Program asks user to enter the task for the print (0-10)
1		User chooses task 1
	Score input dialog	Program asks user to enter the score (1-10)
4		User chooses 4 as score
	The list is ...	Program prints a list of participants with scores smaller than 4 for the first task

User Input	Program output	Description
	Print submenu	

F7 : Printează participanții ordonați după scor

User Input	Program output	Description
	Application Menu	Program prints main menu
3		User chooses the print submenu
	Print submenu	Program prints the print submenu
2		User chooses to print all participants in order of score
	Task input dialog	Program asks user to enter the task for the print (0-10)
1		User chooses task 1
	The list is ...	Program prints a list of participants in order of their scores for the first task
	Print submenu	
2		User chooses to print all participants in order of score
	Task input dialog	Program asks user to enter the task for the print (0-10)
0		User chooses 0, the sum of scores for all tasks
	The list is ...	Program prints a list of participants in order of their scores for all tasks
	Print submenu	

F8 : Printează participanții cu scor mai mic decât un scor dat, ordonați după scor

User Input	Program output	Description
	Application Menu	Program prints main menu
3		User chooses the print submenu
	Print submenu	Program prints the print submenu
3		User chooses to print all participants in order of score, with score smaller than

User Input	Program output	Description
	Task input dialog	Program asks user to enter the task for the print (0-10)
0		User chooses task 0, sum of scores for all tasks
	Score input dialog	Program asks user to enter the score (1-100)
94		User chooses 94 as score
	The list is ...	Program prints a list of participants with scores smaller than 94, in order of their scores for all tasks
	Print submenu	

F9 : Calculează media scorurilor pentru un interval dat

User Input	Program output	Description
	Application Menu	Program prints main menu
4		User chooses the operation submenu
	Operation submenu	Program prints the operation submenu
1		User chooses to calculate the average of scores in an interval
	Participant input dialog (left endpoint)	Program asks user to enter the participant number for the left end of the interval (eg 1-3)
2		User chooses participant 2 for the left end of the interval
	Participant input dialog (right endpoint)	Program asks user to enter the participant number for the right end of the interval (eg 1-3)
3		User chooses participant 3 for the right end of the interval, $3 > 2$
	Task input dialog	Program asks user to enter the task for the score modification (1-10)
1		User chooses task 1
	2.33	Program prints average of numbers
	Operation submenu	

F10 : Calculează scorul minim pentru un interval dat

User Input	Program output	Description
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User Input	Program output	Description
	Application Menu	Program prints main menu
4		User chooses the operation submenu
	Operation submenu	Program prints the operation submenu
2		User chooses to calculate the minimum of scores in an interval
	Participant input dialog (left endpoint)	Program asks user to enter the participant number for the left end of the interval (eg 1-3)
2		User chooses participant 2 for the left end of the interval
	Participant input dialog (right endpoint)	Program asks user to enter the participant number for the right end of the interval (eg 1-3)
3		User chooses participant 3 for the right end of the interval, $3 > 2$
	Task input dialog	Program asks user to enter the task for the score modification (1-10)
1		User chooses task 1
	1	Program prints minimum of numbers
	Operation submenu	

F11 : Tipărește participanții dintr-un interval dat cu scor multiplu de 10

User Input	Program output	Description
	Application Menu	Program prints main menu
4		User chooses the operation submenu
	Operation submenu	Program prints the operation submenu
2		User chooses to print participants with scores multiples of 10 in an interval
	Participant input dialog (left endpoint)	Program asks user to enter the participant number for the left end of the interval (eg 1-3)
2		User chooses participant 2 for the left end of the interval
	Participant input dialog (right endpoint)	Program asks user to enter the participant number for the right end of the interval (eg 1-3)
3		User chooses participant 3 for the right end of the interval, $3 > 2$
	Task input dialog	Program asks user to enter the task for the score modification (1-10)

User Input	Program output	Description
1		User chooses task 1
	[1,2]	Program prints the required list
	Operation submenu	

F12 : Filtrează participanții cu scor multiplu de un scor dat

User Input	Program output	Description
	Application Menu	Program prints main menu
5		User chooses the filter submenu
	Operation submenu	Program prints the filter submenu
1		User chooses to filter out scores multiples of
	Task input dialog	Program asks user to enter the task for the print (0-10)
1		User chooses task 1
	Score input dialog	Program asks user to enter the score (1-10)
4		User chooses 4 as score
	The list is ...	Program prints given list
	Print submenu	

F13 : Filtrează participanții cu scor mai mic decât un scor dat

User Input	Program output	Description
	Application Menu	Program prints main menu
5		User chooses the filter submenu
	Operation submenu	Program prints the filter submenu
2		User chooses to filter out scores smaller than
	Task input dialog	Program asks user to enter the task for the print (0-10)
1		User chooses task 1
	Score input dialog	Program asks user to enter the score (1-10)
4		User chooses 4 as score
	The list is ...	Program prints given list
	Print submenu	

F14 : Reface ultima operație asupra listei

User Input	Program output	Description
	Application Menu	Program prints main menu
6		User chooses to undo the last operation
	Undo successful	Confirms the operation was successful if there was something to undo
or		
	No more actions left to undo	Warns the user there is nothing left to undo
	Application submenu	

Listă de taskuri

- F1:
 - T1 : Input task, scor
 - T2 : Creeaza lista noua cu scorul setat pentru task
 - T3 : Adauga noua lista curenta la lista cu toate starile
- F2:
 - T1 : Input participant, task, scor
 - T2 : Schimba scorul participantului la task in scor
 - T3 : Adauga noua lista curenta la lista cu toate starile
- F3:
 - T1 : Input participant, task
 - T2 : Sterge scorul participantului la task
 - T3 : Adauga noua lista curenta la lista cu toate starile
- F4:
 - T1 : Input interval, task
 - T2 : Sterge scorul participantilor din interval la task
 - T3 : Adauga noua lista curenta la lista cu toate starile
- F5:
 - T1 : Input participant, task, scor
 - T2 : Schimba scorul participantului la task in scor
 - T3 : Adauga noua lista curenta la lista cu toate starile
- F6:

- T1 : Input task, scor
- T2 : Obtine lista filtrata
- T3 : Afiseaza lista
- F7:
 - T1 : Obtine lista sortata
 - T2 : Afiseaza lista
- F8:
 - T1 : Input task, scor
 - T2 : Obtine lista filtrata
 - T3 : Obtine lista sortata
 - T4 : Afiseaza lista
- F9:
 - T1 : Input interval, task
 - T2 : Obtine lista trunchiata
 - T3 : Calculeaza media listei
 - T4 : Afiseaza rezultatul
- F10:
 - T1 : Input interval, task
 - T2 : Obtine lista trunchiata
 - T3 : Calculeaza minimul listei
 - T4 : Afiseaza rezultatul
- F11:
 - T1 : Input interval, task
 - T2 : Obtine lista trunchiata
 - T3 : Filtreaza lista
 - T4 : Afiseaza lista
- F12:
 - T1 : Input task, scor
 - T2 : Obtine lista filtrata
 - T3 : Afiseaza lista
- F13:
 - T1 : Input task, scor
 - T2 : Obtine lista filtrata
 - T3 : Afiseaza lista
- F14:
 - T1 : Sterge ultimul element din lista cu toate starile

