



N CYCLISTS participated in the Tour de France in 20 STAGES. The information of all the distances covered by each of them in each stage was stored in a matrix of type double of dimension N x 20 called DISTANCES. For

the names of the cyclists, we have a vector of N positions called CYCLISTS. Create a subprogram to "burn" the data.

1. Create a subprogram that allows to print any matrix that is sent to you (Remember to receive a custom message for each array).
2. Create a general subprogram of type double that allows to print each of the vectors that are required in this program (Remember to receive a custom message for each vector).
3. Create a subprogram that returns the sum of any area of the DISTANCES matrix. Receive the parameters start of row, end of row, start of column and end of column.
4. Create a subprogram that sorts a vector in ascending or descending order, depending on the value of a parameter called SORT (1-ascending 2-descending).
5. Print the Matrix DISTANCES. Use the subprogram created in point 1.
6. Print the sum of distances of the first 5 stages. Use the subprogram created in point 3.
7. Print the sum of distances of the last 5 stages. Use the subprogram created in point 3.
8. Print the sum of distances of the first half of cyclists. Use the subprogram created in point 3.
9. Print the sum of distances of the last half of cyclists. Use the subprogram created in point 3.
10. Print the sum of distances from stage 5 to 15. Use the subprogram created in point 3.

**CREATE A SUBPROGRAM FOR CALCULATIONS FOR EACH CYCLIST AND ANOTHER SUBPROGRAM FOR CALCULATIONS FOR EACH STAGE:**

11. AVERAGE distance for each cyclist. Print the cyclist 's name and team's name.
12. MAJOR distance for each cyclist. Print the cyclist 's name and team's name.
13. SUM of distances multiple of 10 for each cyclist. Print the cyclist 's name and team's name.

14. PERCENT of odd distances for each cyclist. Print the cyclist 's name and team's name.
15. PERCENT of multiple of 5 distances for each stage. Print the stage's number.
16. SUM of distances for each stage. Print the stage's number.
17. MINOR distances for each stage. Print the stage's number.
18. AVERAGE of two-digit distances for each stage. Print the stage's number.
  
19. Print each vector (point 11 to 18) using the subprogram created in point 2.
20. Print AVERAGE vector of two-digit distances for each stage created in point 18. Ask the user if he wants to sort in ascending (1) or descending (2) order.

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## ANSWERS (CLIPPED)

6. Sum of distances of the first 5 stages	65.893,00																			
7. Sum of distances of the last 5 stages	65.518,00																			
8. Sum of distances of the first half of cyclists	132.542,00																			
9. Sum of distances of the last half of cyclists	129.812,00																			
10. Sum of distances from stage 5 to 15	130.943,00																			
15. PERCENTAGE multiple of 5 distances x stage	15,91%	11,36%	27,27%	20,45%	19,32%	31,82%	20,45%	23,86%	25,00%	21,59%	14,77%	19,32%	26,14%	19,32%	19,32%	21,59%	15,91%	14,77%	20,45%	25,00%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
16. SUM of distances for each stage	13.289,00	13.740,00	12.508,00	13.055,00	13.301,00	12.570,00	12.419,00	13.394,00	13.558,00	12.962,00	13.284,00	12.909,00	13.295,00	12.917,00	13.635,00	13.023,00	12.885,00	12.282,00	14.398,00	12.930,00
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
17. MINOR distances for each stage	52,00	50,00	50,00	51,00	54,00	51,00	52,00	54,00	53,00	50,00	54,00	50,00	52,00	52,00	64,00	52,00	52,00	50,00	53,00	52,00
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
18. AVERAGE of two-digit distances x stage	71,48	66,57	76,26	67,00	73,38	73,54	73,38	73,55	67,27	77,67	78,76	70,95	68,42	72,10	79,80	79,64	73,46	77,72	80,16	75,04
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
20. Print AVERAGE of two-digit distances x stage	66,57	67,00	67,27	68,42	70,95	71,48	72,10	73,38	73,38	73,46	73,54	73,55	75,04	76,26	77,67	77,72	78,76	79,64	79,80	80,16
Ascendente	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
20. Print AVERAGE of two-digit distances x stage	80,16	79,80	79,64	78,76	77,72	77,67	76,26	75,04	73,55	73,54	73,46	73,38	73,38	72,10	71,48	70,95	68,42	67,27	67,00	66,57
Descendente	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

11-AVERAGE	12-MAJOR	13-SUM Dist % 10	14-PERCENT odd	CICLISTAS	TEAMS
Distance x Cyclist	Distance x Cyclist	Distance x Cyclist	Distance x Cyclist		
135,15	245,00	220,00	45,00%	Geraint Thomas (Gbr)	Ineos
125,8	221,00	150,00	70,00%	Egan Bernal (Col)	Ineos
144,35	241,00	410,00	45,00%	Jonathan Castroviejo (Esp)	Ineos
129,25	231,00	330,00	45,00%	Michal Kwiatkowski (Pol)	Ineos
144,9	239,00	360,00	50,00%	Gianni Moscon (Ita)	Ineos
163,4	242,00	0,00	60,00%	Wout Poels (Ned)	Ineos
160,8	242,00	600,00	40,00%	Luke Rowe (Gbr)	Ineos
146,75	248,00	470,00	45,00%	Dylan Van Baarle (Ned)	Ineos
163,15	245,00	0,00	55,00%	Peter Sagan (Svk)	Bora-Hansgrohe
136,4	225,00	260,00	40,00%	Emanuel Buchmann (Ger)	Bora-Hansgrohe
161,5	233,00	0,00	50,00%	Marcus Burghardt (Ger)	Bora-Hansgrohe
149,3	246,00	580,00	30,00%	Patrick Konrad (Aut)	Bora-Hansgrohe
157,05	232,00	480,00	55,00%	Gregor Mühlberger (Aut)	Bora-Hansgrohe
159,6	225,00	210,00	60,00%	Daniel Oss (Ita)	Bora-Hansgrohe
157,9	245,00	590,00	40,00%	Lukas Pöstlberger (Aut)	Bora-Hansgrohe
168,95	248,00	270,00	45,00%	Maximilian Schachmann (Ger)	Bora-Hansgrohe
156,35	248,00	0,00	55,00%	Julian Alaphilippe (Fra)	Deceuninck-Quick Step
139	229,00	0,00	60,00%	Kasper Asgreen (Den)	Deceuninck-Quick Step
136,85	236,00	460,00	25,00%	Dries Devenyns (Bel)	Deceuninck-Quick Step
149,85	227,00	470,00	55,00%	Yves Lampaert (Bel)	Deceuninck-Quick Step
175,8	250,00	860,00	40,00%	Enric Mas (Esp)	Deceuninck-Quick Step
141,9	246,00	200,00	60,00%	Michael Morkov (Den)	Deceuninck-Quick Step
157,7	246,00	520,00	30,00%	Maximiliano Richeze (Arg)	Deceuninck-Quick Step
155,95	237,00	400,00	55,00%	Elia Viviani (Ita)	Deceuninck-Quick Step
163,25	248,00	200,00	45,00%	Romain Bardet (Fra)	AG2R-La Mondiale
139,45	250,00	300,00	25,00%	Mickaël Cherel (Fra)	AG2R-La Mondiale
133,35	234,00	170,00	35,00%	Benoit Cosnefroy (Fra)	AG2R-La Mondiale
146,55	245,00	490,00	55,00%	Mathias Frank (Sui)	AG2R-La Mondiale
167,55	250,00	430,00	45,00%	Tony Gallopin (Fra)	AG2R-La Mondiale
152	227,00	200,00	70,00%	Alexis Gougeard (Fra)	AG2R-La Mondiale
154,6	241,00	290,00	60,00%	Oliver Naesen (Bel)	AG2R-La Mondiale
152,35	250,00	650,00	25,00%	Alexis Vuillermoz (Fra)	AG2R-La Mondiale
177,6	250,00	750,00	40,00%	Vincenzo Nibali (Ita)	Bahrain-Merida