

Laboratory Work №4

Theme: The searching and sorting algorithms with using Software Methodical Complex “Video interpreter”.

Objective: To leaning algorithms of searching and sorting

Solution algorithm:

Let it is necessary to sort an array on increase. For solution of this task it is necessary to take advantage of one of algorithms of sorting in the training aids and to execute it using programming environment. To calculate a quantity of comparison's actions and a quantity of permutation's(exchange of two elements of array) actions.

Task

Using the training aids “Algorithms of searching and sorting” get to know the next sorting algorithms:

1. Sorting by exchanges
2. Sorting by choice
3. Improved algorithm of sorting by exchange(v.1)
4. Tree sorting
5. Sorting by inserts
6. Pyramidal sorting
7. Quick sorting by Hoar

In the environment of programming «Video interpreter» to open algorithms of:

1. Sorting by exchanges
2. Sorting by choice
3. Improved algorithm of sorting by exchange(v.1)
4. Improved algorithm of sorting by exchange(v.2)
5. Sorting by inserts
6. Pyramidal sorting
7. Quick sorting by Hoar

To execute each algorithm in the demonstration environment, using as data files from your variant. To calculate quantity of comparisons and permutation at performance of each algorithm of sorting for each of a variant's array. To present your results in the form of the table.

Task loading

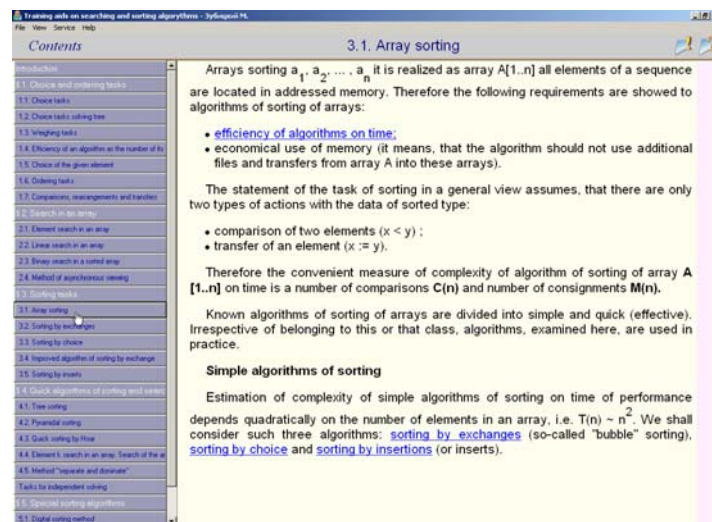
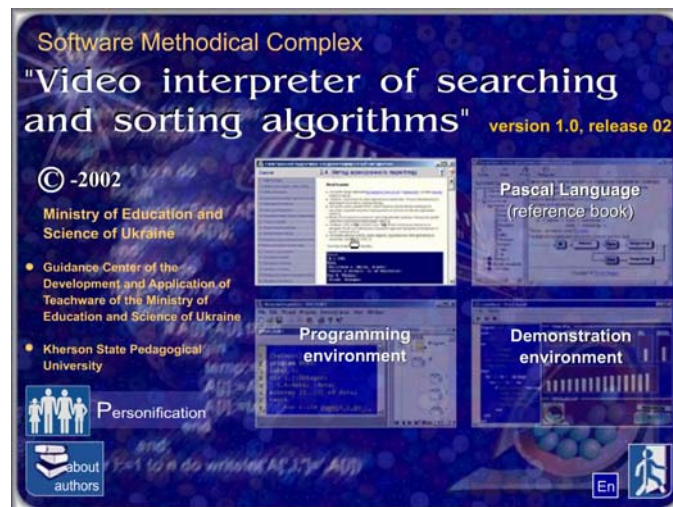
1. Execute command Activate key \Programs\ KSPU Software\SMC Video interpreter;
2. Download the main form of the program;
3. Choose «Personification»:



4. To choose “Group” and the name of the “User” in “Personification” window and to press the button “Execute”:



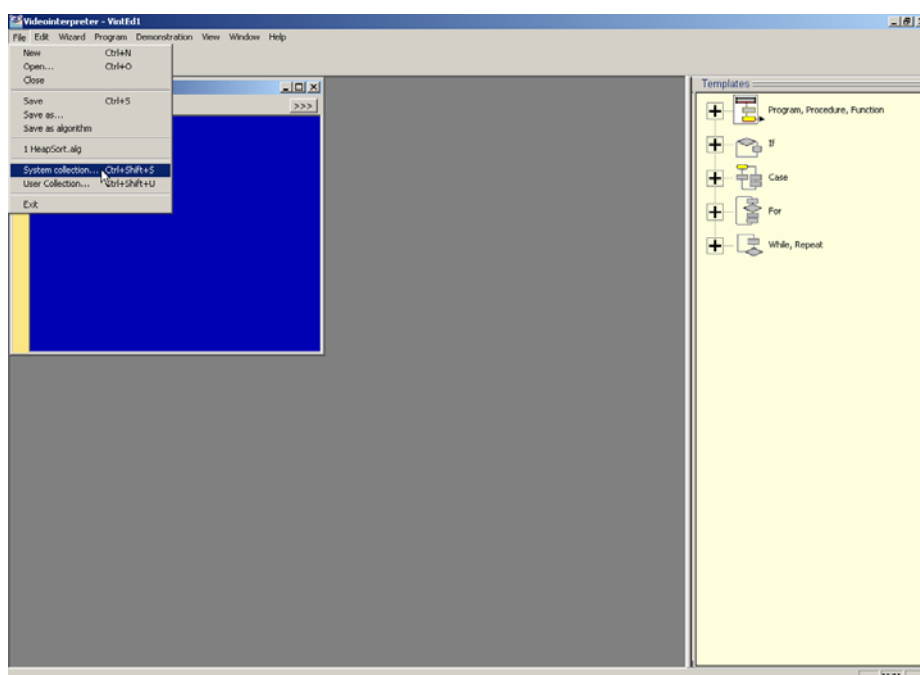
5. To choose the unit «Searching and sorting algorithms (training aids)»:



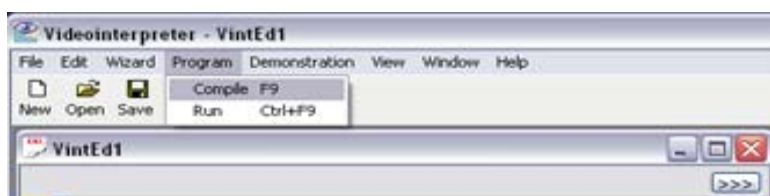
6. To choose the unit «Programming environment»:



7. To download «Programming environment», to enter the program code of algorithm of sort;



8. Then the programming code will be finished, press in main menu Program/Compile. How ever the process of compile will be finished without mistakes, execute you program (main menu Program/Run)



9. To press in main menu Demonstration/Make or press a button F8. You will see the process of sorting on Demonstration environment of SPC Video Interpreter.



10. To use this algorithm to each array of you variant and enter the getting data into the table.
11. Using all algorithms of sorting to each massive of you variant.

Array number	1-		2-		3-		4-	
	comparisons	permutation	comparisons	permutation	comparisons	permutation	comparisons	permutation
Sorting by exchanges								
Sorting by choice								
Improved algorithm of sorting by exchange								
Sorting by inserts								
Tree sorting								
Pyramidal sorting								
Quick sorting by Hoar								

Task variants:

Table 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	44	11	14	34	16	9	19	22	5	24	4	43	3	15	46	19	39	17
2	35	43	36	16	9	17	24	13	42	14	25	8	44	15	39	49	25	45	42	2
3	8	8	26	2	30	1	39	33	39	36	28	11	35	30	48	33	50	13	34	15
4	5	39	25	45	26	29	48	35	18	1	36	50	39	38	10	8	46	40	30	44
5	35	15	5	32	15	44	9	14	28	49	9	8	14	9	29	25	15	8	31	37
6	38	5	4	3	6	40	41	20	31	22	38	25	18	41	41	8	5	4	4	10
7	34	12	29	13	19	42	16	16	33	35	46	16	24	15	39	38	28	37	21	28
8	30	45	34	6	24	21	6	3	28	34	5	47	42	35	47	14	36	37	25	34
9	8	12	48	19	7	50	16	3	6	44	28	35	6	34	1	16	46	27	17	23
10	46	18	18	25	4	43	39	10	47	25	7	45	21	11	41	30	6	32	47	28
11	17	23	12	10	35	50	32	35	28	5	38	8	12	45	36	22	50	8	2	10
12	1	19	20	19	5	23	26	24	34	41	29	13	19	30	44	31	13	35	28	44
13	19	19	32	40	23	11	35	42	38	46	10	39	14	15	36	23	49	10	1	12
14	45	17	44	39	49	14	20	42	2	13	3	26	22	1	8	36	16	20	28	14
15	27	39	29	12	44	4	25	4	19	34	11	41	27	21	2	50	9	3	3	6
16	8	15	4	36	18	40	33	29	45	2	13	45	35	2	8	8	21	21	8	1
17	41	48	6	11	39	50	25	2	30	41	47	26	34	50	39	36	45	50	37	40
18	1	19	16	4	40	14	43	46	3	45	48	25	35	19	22	38	35	18	32	26
19	49	6	50	2	31	18	26	33	41	32	48	25	25	50	12	10	22	35	38	2
20	21	41	24	9	32	4	49	40	44	22	1	12	29	45	3	26	47	44	43	37

Table 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	1	1	5	8	8	8	17	19	21	27	30	34	35	35	38	41	45	46	49
2	2	5	6	8	12	12	15	15	17	18	19	19	19	23	39	39	41	43	45	48
3	4	4	5	6	12	16	18	20	24	25	26	29	29	32	34	36	44	44	48	50
4	2	2	3	4	6	9	10	11	11	12	13	16	19	19	25	32	36	39	40	45
5	4	5	6	7	9	14	15	18	19	23	24	26	30	31	32	35	39	40	44	49
6	1	4	4	11	14	14	17	18	21	23	29	34	40	40	42	43	44	50	50	50
7	6	9	16	16	16	20	24	25	25	26	26	32	33	35	39	39	41	43	48	49
8	2	3	3	4	9	10	13	14	16	20	24	29	33	33	35	35	40	42	42	46
9	2	3	6	18	19	19	28	28	28	30	31	33	34	38	39	41	42	44	45	47
10	1	2	5	13	14	22	22	22	25	32	34	34	35	36	41	41	44	45	46	49
11	1	3	5	5	7	9	10	11	13	25	28	28	29	36	38	38	46	47	48	48
12	8	8	8	11	12	13	16	24	25	25	25	26	26	35	39	41	45	45	47	50
13	4	6	12	14	14	18	19	21	22	24	25	27	29	34	35	35	35	39	42	44
14	1	2	9	11	15	15	15	19	21	30	30	34	35	38	41	43	45	45	50	50
15	1	2	3	3	8	8	10	12	22	29	36	36	39	39	39	41	41	44	47	48
16	8	8	8	10	14	15	16	22	23	25	26	30	31	33	36	36	38	38	49	50
17	5	6	9	13	15	16	21	22	25	28	35	36	45	46	46	46	47	49	50	50
18	3	4	8	8	10	13	18	19	20	21	27	32	35	35	37	37	40	44	45	50
19	1	2	3	4	8	17	21	25	28	28	30	31	32	34	37	38	39	42	43	47
20	1	2	2	6	10	10	12	14	15	17	23	26	28	28	34	37	37	40	44	44

Table 3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	125	118	100	97	97	94	92	82	76	73	73	72	63	48	39	39	35	33	28	7
2	123	117	114	111	110	107	107	106	101	99	89	89	85	73	72	71	60	45	44	15
3	119	115	110	96	93	87	81	80	76	53	50	43	40	29	25	19	10	9	8	3
4	109	100	98	95	83	80	73	70	67	63	60	48	46	33	23	21	16	13	11	10
5	121	118	115	111	109	103	87	37	35	34	32	30	28	25	21	17	8	4	3	1
6	124	120	118	116	111	105	101	100	97	85	84	75	73	68	66	63	53	46	43	35
7	108	98	75	74	73	64	62	61	60	60	58	58	57	57	49	45	44	43	33	28
8	89	70	69	64	54	52	50	46	46	45	43	41	39	38	37	35	33	23	22	17
9	62	62	52	48	48	47	43	40	39	37	32	31	30	28	27	23	22	21	21	13
10	48	41	34	32	30	29	29	28	28	23	23	21	21	21	21	19	17	12	12	9
11	63	54	45	41	39	39	35	34	33	28	28	28	27	26	25	23	17	14	12	10
12	80	75	66	54	52	49	42	41	40	37	34	34	29	29	28	27	25	14	14	12
13	96	96	81	71	71	57	51	48	47	46	42	41	37	34	30	28	26	18	14	12
14	107	106	94	85	82	68	63	61	59	57	48	47	46	40	38	34	26	23	14	12
15	85	77	69	67	65	62	48	46	45	33	32	32	28	27	25	24	20	20	8	8
16	73	59	57	47	46	36	35	33	31	29	26	23	22	21	19	14	14	13	7	5
17	61	55	45	44	41	35	24	22	22	19	18	17	17	16	16	12	11	7	5	4
18	54	46	35	34	31	25	21	19	19	14	13	13	12	11	11	11	9	6	5	3
19	46	33	23	22	21	17	14	14	13	13	13	10	9	9	8	7	5	5	3	3
20	96	93	91	84	81	74	65	63	57	50	40	36	29	29	27	25	23	8	4	0

Table 4

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	12	22	38	43	71	87	90	96	81	71	67	36	31	12	8	26	32	54	55	57
2	35	44	77	118	98	75	75	64	62	41	54	75	81	94	65	57	55	54	33	35
3	97	101	109	118	111	111	64	35	21	21	28	34	46	47	27	19	16	14	9	97
4	33	45	55	58	54	35	33	22	22	12	14	14	14	14	8	7	5	5	3	33
5	73	106	119	122	111	101	74	69	62	48	63	80	96	107	85	59	41	35	21	73
6	103	119	122	124	120	119	108	89	52	30	34	42	51	63	62	33	24	19	14	125
7	28	60	60	60	43	43	28	17	13	9	10	14	18	23	20	13	7	6	5	28
8	97	100	117	123	119	116	60	33	32	19	23	28	28	40	28	22	16	11	8	97
9	72	107	121	125	118	68	60	45	40	29	41	49	71	82	77	73	61	46	46	72
10	48	72	106	149	94	63	62	39	37	29	39	52	57	57	45	35	18	13	13	48
11	94	109	113	120	95	85	58	52	48	28	33	40	48	59	46	31	22	19	14	94
12	118	120	121	123	122	125	73	50	48	32	45	66	96	106	69	46	44	25	23	118
13	39	73	87	96	91	73	43	23	23	23	25	34	47	68	48	36	35	34	22	39
14	39	71	98	111	65	46	45	41	31	23	28	29	34	46	25	14	11	9	5	39
15	76	107	116	125	119	111	57	46	30	21	26	29	42	61	32	26	22	21	13	76
16	63	85	93	114	66	53	49	37	21	12	12	12	12	12	8	5	4	3	3	63
17	73	89	119	125	101	100	57	46	27	17	17	25	26	26	24	23	17	11	9	73
18	7	15	34	83	79	66	44	43	43	28	35	37	37	38	33	21	19	11	7	7
19	92	99	116	141	110	105	98	70	47	34	39	54	71	85	67	47	45	31	17	92
20	100	117	125	125	120	84	61	38	28	21	27	27	30	34	20	14	12	12	10	100