

Architektura i Organizacja Komputerów II

Lab 5-6

Zadania

Uwaga!

Podczas tłumaczenia jednej z grup wyrażenia `#94 > r2` najprawdopodobniej został popełniony błąd. Właściwa instrukcja dla powyższego wyrażenia to: `slti r21, r2, 94`.

Sposób wystawienia oceny

Ocena jest wystawiana na podstawie:

- poprawności wykonanych zadań,
- jakości kodu,
- zrozumienia kodu,
- czytelności kodu,
- samodzielności pracy,
- wykonania wszystkich poleceń w zadaniu.

Pytania do prowadzącego **nie** są traktowane jako praca niesamodzielna.

Dane do zadań

ns: numer stanowiska (na monitorze)

np: numer podany przez prowadzącego na zajęciach

grupa: $g = (ns + np) \bmod 35$, gdzie mod oznacza działanie modulo

Tabela 1.1. Liczby do zadań.

g	r1	r2	r3	r4	r5	r6	r7	r8	r9	r10	r11	r12	r13
0	48	48	15	24	43	30	40	12	20	23	8	37	9
1	39	18	46	14	14	0	34	5	47	7	15	26	6
2	27	6	49	3	3	1	5	10	3	17	6	6	16
3	19	46	39	39	38	47	32	43	21	18	42	30	27
4	17	48	46	46	32	0	47	36	2	34	13	17	19
5	7	31	49	1	1	39	25	48	31	37	3	8	19
6	17	44	13	13	37	6	22	25	33	6	13	2	34
7	6	9	30	30	12	37	21	18	40	0	44	34	16
8	3	5	5	36	11	43	42	13	32	3	23	46	46
9	7	44	44	23	25	35	33	16	32	15	17	14	25
10	15	36	36	26	44	18	21	20	3	17	45	47	45
11	20	10	10	23	6	7	19	15	30	26	24	17	24
12	8	0	0	20	39	12	21	35	27	5	12	5	9
13	4	25	26	26	27	48	26	30	15	23	44	8	9
14	10	44	44	35	10	25	9	19	10	20	20	32	27
15	33	25	42	42	4	8	18	47	2	44	39	26	49
16	25	41	43	43	27	5	12	29	1	26	25	42	45
17	36	36	39	44	4	5	21	49	15	0	20	22	19
18	36	40	12	12	0	21	8	10	0	18	24	16	43
19	15	19	47	48	48	34	0	9	21	22	7	8	40
20	33	4	49	10	10	24	21	8	19	21	17	44	26
21	4	4	34	36	27	15	27	11	40	2	1	33	2
22	36	22	22	14	18	5	48	10	37	3	10	39	28
23	49	45	45	45	47	30	37	22	30	16	24	35	44
24	41	31	29	2	2	48	27	37	38	49	48	5	3
25	12	12	16	16	30	23	46	48	15	32	25	44	4

26	21	21	30	6	6	35	28	23	13	17	30	45	0
27	12	12	40	11	46	37	40	44	17	42	5	13	35
28	0	38	38	25	49	3	48	48	27	31	7	32	42
29	26	26	29	48	28	35	21	29	11	33	8	4	35
30	38	3	9	13	13	24	42	20	35	39	28	37	17
31	27	46	2	35	35	33	29	3	24	14	14	19	14
32	19	19	5	39	5	37	21	13	14	44	38	23	28
33	32	32	22	27	36	1	11	10	8	24	27	25	2
34	24	24	32	14	39	44	34	39	4	49	15	46	34

Tabela 1.2. Wyrażenia do zadań.

Grupa	Wyrażenia	Jeśli prawda	Jeśli fałsz
0	$r_0 \leq r_1$ $\#94 > r_2$ $r_2 \leq r_3$ $r_3 > r_4$ $r_4 \neq r_5$ $r_5 \geq \#88$ $(r_0 \leq \#63) \vee (\#53 = \#58)$ $(r_2 \geq r_3) \wedge (r_4 > r_5)$ $(r_4 = r_5) \wedge (r_6 < r_7)$ $(r_6 \neq r_7) \vee (r_8 > r_9)$ $(r_8 > \#62) \wedge (\#39 = \#9)$ $(\#67 > \#83) \wedge (\#27 \neq \#80)$	$r_{20} = 1$ $r_{21} = 1$ $r_{22} = 1$ $r_{23} = 1$ $r_{24} = 1$ $r_{25} = 1$ $r_{26} = 1$ $r_{27} = 1$ $r_{28} = 1$ $r_{29} = 74$ $r_{30} = 21$ $r_{31} = 23$	$r_{20} = 0$ $r_{21} = 0$ $r_{22} = 0$ $r_{23} = -51$ $r_{24} = -55$ $r_{25} = -43$ $r_{26} = 0$ $r_{27} = 0$ $r_{28} = 0$ $r_{29} = -92$ $r_{30} = -68$ $r_{31} = -46$
1	$r_0 \leq r_1$ $r_1 < r_2$ $r_2 < r_3$ $\#15 < \#83$ $r_4 \neq r_5$ $r_5 = \#58$ $(r_0 = r_1) \wedge (r_2 = r_3)$ $(r_2 < r_3) \wedge (r_4 < r_5)$ $(r_4 \geq r_5) \vee (r_6 > r_7)$ $(r_6 \geq r_7) \vee (r_8 > r_9)$ $(\#63 = r_9) \vee (r_{10} \neq r_{11})$ $(r_{10} \leq r_{11}) \wedge (r_{12} = r_{13})$	$r_{20} = 1$ $r_{21} = 1$ $r_{22} = 1$ $r_{23} = 1$ $r_{24} = 1$ $r_{25} = 1$ $r_{26} = 1$ $r_{27} = 1$ $r_{28} = 1$ $r_{29} = 54$ $r_{30} = 26$ $r_{31} = 17$	$r_{20} = 0$ $r_{21} = 0$ $r_{22} = 0$ $r_{23} = -6$ $r_{24} = -9$ $r_{25} = -89$ $r_{26} = 0$ $r_{27} = 0$ $r_{28} = 0$ $r_{29} = -63$ $r_{30} = -5$ $r_{31} = -84$
2	$r_0 < r_1$ $\#45 > r_2$ $\#49 < r_3$ $\#50 \geq r_4$ $r_4 \leq r_5$ $r_5 \leq r_6$ $(r_0 \geq r_1) \wedge (r_2 = r_3)$ $(r_2 > r_3) \vee (r_4 \geq r_5)$ $(r_4 = r_5) \vee (r_6 \neq r_7)$ $(r_6 > r_7) \vee (r_8 > r_9)$ $(r_8 \neq r_9) \wedge (r_{10} \neq r_{11})$ $(\#67 \neq \#28) \vee (\#54 = \#51)$	$r_{20} = 1$ $r_{21} = 1$ $r_{22} = 1$ $r_{23} = 1$ $r_{24} = 1$ $r_{25} = 1$ $r_{26} = 1$ $r_{27} = 1$ $r_{28} = 1$ $r_{29} = 69$ $r_{30} = 19$ $r_{31} = 37$	$r_{20} = 0$ $r_{21} = 0$ $r_{22} = 0$ $r_{23} = -10$ $r_{24} = -2$ $r_{25} = -71$ $r_{26} = 0$ $r_{27} = 0$ $r_{28} = 0$ $r_{29} = -84$ $r_{30} = -15$ $r_{31} = -33$
3	$\#62 \leq r_1$ $r_1 \geq r_2$ $r_2 \geq r_3$ $\#77 < r_4$ $\#73 < r_5$ $\#5 = r_6$ $(r_0 > r_1) \vee (r_2 \leq r_3)$ $(r_2 \leq r_3) \wedge (r_4 \leq r_5)$ $(r_4 = r_5) \wedge (r_6 < r_7)$ $(r_6 \neq r_7) \wedge (r_8 < r_9)$ $(r_8 \neq \#61) \vee (\#30 = \#4)$ $(r_{10} = r_{11}) \vee (r_{12} \geq r_{13})$	$r_{20} = 1$ $r_{21} = 1$ $r_{22} = 1$ $r_{23} = 1$ $r_{24} = 1$ $r_{25} = 1$ $r_{26} = 1$ $r_{27} = 1$ $r_{28} = 1$ $r_{29} = 26$ $r_{30} = 40$ $r_{31} = 87$	$r_{20} = 0$ $r_{21} = 0$ $r_{22} = 0$ $r_{23} = -44$ $r_{24} = -14$ $r_{25} = -3$ $r_{26} = 0$ $r_{27} = 0$ $r_{28} = 0$ $r_{29} = -7$ $r_{30} = -22$ $r_{31} = -11$
4	$r_0 < r_1$ $r_1 \geq r_2$ $\#92 = r_3$ $r_3 \geq r_4$ $r_4 \neq \#51$ $r_5 > r_6$ $(r_0 < r_1) \vee (r_2 \geq r_3)$ $(\#96 \neq r_3) \vee (r_4 = r_5)$ $(r_4 > r_5) \wedge (r_6 \leq r_7)$	$r_{20} = 1$ $r_{21} = 1$ $r_{22} = 1$ $r_{23} = 1$ $r_{24} = 1$ $r_{25} = 1$ $r_{26} = 1$ $r_{27} = 1$ $r_{28} = 1$	$r_{20} = 0$ $r_{21} = 0$ $r_{22} = 0$ $r_{23} = -14$ $r_{24} = -15$ $r_{25} = -64$ $r_{26} = 0$ $r_{27} = 0$ $r_{28} = 0$

	$(r6 = \#99) \vee (\#91 \neq \#85)$ $(r8 \neq r9) \wedge (r10 \neq r11)$ $(r10 > r11) \vee (r12 < r13)$	$r29 = 58$ $r30 = 40$ $r31 = 1$	$r29 = -27$ $r30 = -62$ $r31 = -96$
5	$r0 \geq r1$ $r1 \geq r2$ $\#6 \geq r3$ $\#37 < r4$ $r4 = r5$ $r5 = r6$ $(r0 < r1) \wedge (r2 > r3)$ $(r2 < r3) \wedge (r4 > r5)$ $(r4 \leq r5) \vee (r6 \leq r7)$ $(r6 \leq r7) \vee (r8 > r9)$ $(r8 \geq r9) \vee (r10 \leq r11)$ $(r10 < \#52) \vee (\#44 < \#52)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 41$ $r30 = 37$ $r31 = 12$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -95$ $r24 = -88$ $r25 = -12$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -6$ $r30 = -97$ $r31 = -46$
6	$r0 < r1$ $r1 \neq r2$ $r2 < r3$ $r3 > \#57$ $\#51 = r5$ $r5 = r6$ $(r0 \geq \#96) \vee (\#80 > \#4)$ $(r2 \neq r3) \wedge (r4 \neq r5)$ $(r4 < r5) \vee (r6 > r7)$ $(\#9 \neq r7) \wedge (r8 < r9)$ $(r8 < r9) \vee (r10 \geq r11)$ $(r10 > r11) \wedge (r12 \neq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 86$ $r30 = 52$ $r31 = 65$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -31$ $r24 = -65$ $r25 = -81$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -58$ $r30 = -38$ $r31 = -91$
7	$r0 < r1$ $r1 \leq r2$ $\#45 > r3$ $\#53 \leq r4$ $r4 \geq r5$ $r5 < r6$ $(r0 = \#89) \wedge (\#66 \leq \#23)$ $(r2 < r3) \wedge (r4 = r5)$ $(\#73 \geq r5) \vee (r6 < r7)$ $(r6 < r7) \wedge (r8 \neq r9)$ $(r8 \geq r9) \vee (r10 \leq r11)$ $(r10 \neq r11) \wedge (r12 = r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 2$ $r30 = 49$ $r31 = 63$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -11$ $r24 = -72$ $r25 = -86$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -27$ $r30 = -82$ $r31 = -74$
8	$r0 \neq r1$ $r1 > r2$ $\#20 \geq r3$ $r3 \geq \#15$ $r4 > \#81$ $r5 \geq r6$ $(r0 \geq r1) \vee (r2 \neq r3)$ $(r2 \leq r3) \vee (r4 \leq r5)$ $(\#43 = r5) \wedge (r6 < r7)$ $(r6 = r7) \vee (r8 \geq r9)$ $(r8 \geq \#77) \vee (\#22 < \#91)$ $(r10 < r11) \vee (r12 \geq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 56$ $r30 = 12$ $r31 = 42$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -12$ $r24 = -41$ $r25 = -60$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -62$ $r30 = -13$ $r31 = -57$
9	$r0 \geq \#11$ $r1 \geq \#32$ $r2 < r3$ $r3 = r4$ $r4 \geq \#28$ $r5 \leq r6$ $(r0 \neq r1) \wedge (r2 < r3)$ $(r2 \neq r3) \vee (r4 \leq r5)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -38$ $r24 = -23$ $r25 = -22$ $r26 = 0$ $r27 = 0$

	$(r4 > r5) \wedge (r6 \neq r7)$ $(r6 > r7) \wedge (r8 \neq r9)$ $(r8 \neq \#84) \wedge (\#23 \geq \#24)$ $(\#81 < \#35) \wedge (\#5 \neq \#79)$	$r28 = 1$ $r29 = 42$ $r30 = 1$ $r31 = 47$	$r28 = 0$ $r29 = -34$ $r30 = -43$ $r31 = -4$
10	$\#25 \neq r1$ $r1 > r2$ $r2 \geq \#9$ $r3 < r4$ $r4 = r5$ $r5 > r6$ $(r0 = r1) \wedge (r2 \neq r3)$ $(r2 = r3) \vee (r4 > r5)$ $(r4 \geq r5) \vee (r6 > r7)$ $(\#46 = r7) \wedge (r8 = r9)$ $(\#0 > r9) \wedge (r10 = r11)$ $(r10 = r11) \vee (r12 \leq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 34$ $r30 = 17$ $r31 = 62$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -15$ $r24 = -10$ $r25 = -43$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -32$ $r30 = -52$ $r31 = -77$
11	$r0 > r1$ $r1 \leq \#60$ $\#70 \geq r3$ $r3 > \#84$ $\#41 \geq r5$ $r5 \leq r6$ $(r0 > r1) \wedge (r2 \neq r3)$ $(\#92 > r3) \wedge (r4 > r5)$ $(\#80 \geq r5) \vee (r6 < r7)$ $(r6 \leq r7) \vee (r8 < r9)$ $(r8 > r9) \vee (r10 \geq r11)$ $(\#56 \neq r11) \vee (r12 \neq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 13$ $r30 = 43$ $r31 = 10$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -86$ $r24 = -62$ $r25 = -9$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -45$ $r30 = -21$ $r31 = -14$
12	$r0 \neq \#9$ $r1 = r2$ $r2 < r3$ $r3 > r4$ $r4 < \#44$ $r5 > r6$ $(\#73 \geq r1) \wedge (r2 = r3)$ $(\#56 = r3) \wedge (r4 > r5)$ $(r4 = \#75) \wedge (\#51 \leq \#60)$ $(r6 = \#46) \vee (\#45 = \#29)$ $(\#64 > r9) \wedge (r10 < r11)$ $(r10 \neq r11) \vee (r12 \neq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 67$ $r30 = 38$ $r31 = 46$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -92$ $r24 = -65$ $r25 = -36$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -44$ $r30 = -58$ $r31 = -63$
13	$r0 > r1$ $r1 \neq \#85$ $r2 = r3$ $\#76 \leq \#88$ $r4 < r5$ $r5 \leq r6$ $(\#38 < r1) \vee (r2 \geq r3)$ $(r2 \neq r3) \wedge (r4 \neq r5)$ $(r4 \geq r5) \vee (r6 < r7)$ $(r6 > r7) \wedge (r8 > r9)$ $(r8 < r9) \wedge (r10 = r11)$ $(r10 \leq r11) \vee (r12 \neq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 90$ $r30 = 20$ $r31 = 60$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -68$ $r24 = -44$ $r25 = -68$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -97$ $r30 = -60$ $r31 = -29$
14	$r0 < r1$ $r1 \leq r2$ $r2 \leq \#62$ $r3 < \#12$ $r4 < r5$ $r5 < r6$ $(r0 < r1) \wedge (r2 \neq r3)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -43$ $r24 = -5$ $r25 = -16$ $r26 = 0$

	$(r2 \neq r3) \vee (r4 \geq r5)$ $(r4 > r5) \vee (r6 \leq r7)$ $(r6 < \#68) \vee (\#20 < \#47)$ $(r8 = r9) \vee (r10 \neq r11)$ $(r10 = \#66) \vee (\#18 > \#96)$	$r27 = 1$ $r28 = 1$ $r29 = 56$ $r30 = 32$ $r31 = 20$	$r27 = 0$ $r28 = 0$ $r29 = -91$ $r30 = -63$ $r31 = -93$
15	$r0 = \#42$ $r1 \leq r2$ $r2 < r3$ $\#73 \leq r4$ $\#39 < r5$ $r5 \neq r6$ $(\#89 < r1) \wedge (r2 \leq r3)$ $(r2 = r3) \vee (r4 = r5)$ $(r4 > r5) \wedge (r6 = r7)$ $(r6 \geq r7) \wedge (r8 = r9)$ $(r8 < r9) \vee (r10 \leq r11)$ $(r10 > \#2) \vee (\#6 \neq \#9)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 28$ $r30 = 4$ $r31 = 66$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -56$ $r24 = -27$ $r25 = -41$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -66$ $r30 = -61$ $r31 = -22$
16	$r0 \neq r1$ $r1 > \#45$ $\#34 < r3$ $r3 > r4$ $\#34 \geq r5$ $r5 \geq r6$ $(r0 = r1) \vee (r2 < r3)$ $(r2 = r3) \wedge (r4 \neq r5)$ $(\#82 \geq r5) \wedge (r6 \neq r7)$ $(\#19 < r7) \vee (r8 \neq r9)$ $(\#49 \leq r9) \wedge (r10 = r11)$ $(r10 < r11) \wedge (r12 = r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 99$ $r30 = 90$ $r31 = 97$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -61$ $r24 = -89$ $r25 = -86$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -46$ $r30 = -58$ $r31 = -46$
17	$r0 \leq r1$ $r1 > r2$ $r2 \neq r3$ $\#47 \geq r4$ $r4 = r5$ $r5 > r6$ $(r0 \leq r1) \vee (r2 \neq r3)$ $(r2 \neq r3) \wedge (r4 < r5)$ $(r4 > r5) \vee (r6 > r7)$ $(r6 \leq r7) \wedge (r8 \geq r9)$ $(r8 \geq r9) \vee (r10 > r11)$ $(\#40 \leq r11) \vee (r12 \geq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 29$ $r30 = 63$ $r31 = 20$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -77$ $r24 = -91$ $r25 = -45$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -30$ $r30 = -36$ $r31 = -17$
18	$\#59 = r1$ $r1 < r2$ $\#48 > r3$ $r3 > r4$ $r4 \neq r5$ $r5 = r6$ $(r0 < r1) \wedge (r2 = r3)$ $(r2 = r3) \wedge (r4 \geq r5)$ $(r4 = r5) \vee (r6 \leq r7)$ $(r6 \neq \#33) \wedge (\#0 \neq \#2)$ $(r8 < r9) \wedge (r10 \neq r11)$ $(r10 > r11) \vee (r12 \geq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 11$ $r30 = 97$ $r31 = 22$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -34$ $r24 = -27$ $r25 = -46$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -79$ $r30 = -61$ $r31 = -85$
19	$r0 \leq \#85$ $r1 = r2$ $\#81 > r3$ $\#70 > r4$ $r4 \geq r5$ $\#29 > r6$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -75$ $r24 = -18$ $r25 = -72$

	$(r0 \geq r1) \vee (r2 = r3)$ $(r2 \leq \#43) \wedge (\#85 \geq \#84)$ $(r4 = \#62) \vee (\#16 < \#45)$ $(r6 = r7) \vee (r8 < r9)$ $(r8 < r9) \vee (r10 \neq r11)$ $(r10 \geq r11) \vee (r12 \neq r13)$	$r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 22$ $r30 = 77$ $r31 = 94$	$r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -95$ $r30 = -98$ $r31 = -7$
20	$r0 \geq r1$ $\#44 \neq r2$ $\#28 > r3$ $\#62 \leq r4$ $r4 \neq \#31$ $r5 \geq r6$ $(r0 \geq r1) \vee (r2 = r3)$ $(r2 < r3) \wedge (r4 < r5)$ $(r4 \neq r5) \wedge (r6 \leq r7)$ $(r6 \geq r7) \wedge (r8 \leq r9)$ $(r8 > \#59) \vee (\#25 \neq \#55)$ $(r10 \geq r11) \wedge (r12 \neq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 4$ $r30 = 65$ $r31 = 31$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -25$ $r24 = -91$ $r25 = -62$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -2$ $r30 = -61$ $r31 = -15$
21	$\#67 = r1$ $r1 > \#41$ $r2 > r3$ $\#90 \geq r4$ $\#99 \leq r5$ $r5 \geq r6$ $(r0 < r1) \wedge (r2 < r3)$ $(r2 \leq r3) \vee (r4 < r5)$ $(r4 = r5) \vee (r6 < r7)$ $(r6 \geq r7) \wedge (r8 \geq r9)$ $(r8 \geq r9) \wedge (r10 \geq r11)$ $(\#28 \leq r11) \wedge (r12 > r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 28$ $r30 = 19$ $r31 = 36$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -25$ $r24 = -12$ $r25 = -61$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -98$ $r30 = -67$ $r31 = -57$
22	$r0 \neq r1$ $r1 < r2$ $r2 > r3$ $\#88 \neq r4$ $r4 \geq r5$ $r5 = r6$ $(r0 > r1) \wedge (r2 \neq r3)$ $(\#60 > \#45) \vee (\#93 = \#89)$ $(r4 > r5) \wedge (r6 = r7)$ $(\#62 \leq r7) \vee (r8 \geq r9)$ $(\#98 > r9) \vee (r10 = r11)$ $(r10 > r11) \vee (r12 \neq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 18$ $r30 = 69$ $r31 = 44$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -78$ $r24 = -49$ $r25 = -55$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -57$ $r30 = -50$ $r31 = -91$
23	$r0 > r1$ $r1 > \#44$ $r2 > \#82$ $\#86 \leq \#73$ $r4 > r5$ $r5 < r6$ $(r0 > r1) \wedge (r2 = r3)$ $(r2 > r3) \wedge (r4 = r5)$ $(\#20 > \#38) \vee (\#61 \neq \#58)$ $(r6 < r7) \vee (r8 \neq r9)$ $(r8 > r9) \wedge (r10 = r11)$ $(r10 = r11) \vee (r12 < r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 90$ $r30 = 4$ $r31 = 83$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -47$ $r24 = -61$ $r25 = -86$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -26$ $r30 = -41$ $r31 = -72$
24	$r0 > r1$ $r1 \neq \#47$ $\#78 \leq r3$ $r3 \neq \#66$ $r4 \geq \#49$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -28$ $r24 = -32$

	$r5 \geq r6$ $(r0 \neq r1) \vee (r2 > r3)$ $(r2 \leq r3) \wedge (r4 > r5)$ $(\#7 \leq r5) \vee (r6 \leq r7)$ $(r6 > \#24) \vee (\#33 \geq \#85)$ $(\#24 = r9) \wedge (r10 \geq r11)$ $(\#6 \neq r11) \vee (r12 \leq r13)$	$r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 67$ $r30 = 59$ $r31 = 68$	$r25 = -14$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -75$ $r30 = -22$ $r31 = -98$
25	$r0 < r1$ $r1 = r2$ $\#48 = r3$ $r3 \neq r4$ $r4 < \#81$ $r5 \neq r6$ $(r0 \leq r1) \wedge (r2 = r3)$ $(r2 \neq r3) \wedge (r4 < r5)$ $(r4 \geq r5) \vee (r6 \geq r7)$ $(r6 \leq r7) \vee (r8 \geq r9)$ $(r8 = \#99) \wedge (\#97 < \#88)$ $(r10 \geq r11) \vee (r12 = r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 16$ $r30 = 1$ $r31 = 6$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -43$ $r24 = -49$ $r25 = -35$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -85$ $r30 = -32$ $r31 = -86$
26	$r0 \geq \#4$ $r1 \geq r2$ $r2 = \#56$ $r3 < r4$ $r4 \neq r5$ $r5 > r6$ $(r0 < r1) \wedge (r2 \neq r3)$ $(r2 = r3) \wedge (r4 = r5)$ $(r4 = r5) \vee (r6 = r7)$ $(r6 \leq r7) \wedge (r8 \neq r9)$ $(r8 \neq r9) \vee (r10 \geq r11)$ $(r10 \leq r11) \vee (r12 = r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 90$ $r30 = 44$ $r31 = 3$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -51$ $r24 = -59$ $r25 = -71$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -42$ $r30 = -73$ $r31 = -96$
27	$r0 \neq r1$ $r1 = r2$ $r2 = r3$ $\#39 \neq r4$ $r4 \neq r5$ $\#83 \geq r6$ $(\#57 > r1) \wedge (r2 \geq r3)$ $(r2 \leq r3) \vee (r4 = r5)$ $(r4 \neq \#17) \wedge (\#37 \leq \#53)$ $(r6 < r7) \wedge (r8 > r9)$ $(r8 > r9) \wedge (r10 \neq r11)$ $(r10 < r11) \wedge (r12 = r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 57$ $r30 = 41$ $r31 = 66$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -84$ $r24 = -89$ $r25 = -22$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -18$ $r30 = -39$ $r31 = -79$
28	$r0 = \#33$ $r1 \geq r2$ $\#28 \leq r3$ $r3 = r4$ $\#7 \neq \#47$ $r5 < r6$ $(r0 > r1) \vee (r2 < r3)$ $(r2 < \#21) \wedge (\#41 \leq \#59)$ $(r4 = r5) \vee (r6 > r7)$ $(r6 = r7) \vee (r8 \neq r9)$ $(r8 \neq r9) \vee (r10 \neq r11)$ $(r10 \leq r11) \vee (r12 = r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 4$ $r30 = 18$ $r31 = 24$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -43$ $r24 = -61$ $r25 = -51$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -13$ $r30 = -88$ $r31 = -41$
29	$r0 < \#14$ $\#43 > \#23$ $\#4 > r3$ $r3 \leq r4$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -71$

	$r4 > r5$ $r5 \leq r6$ $(r0 \neq r1) \wedge (r2 \leq r3)$ $(r2 \leq r3) \wedge (r4 \geq r5)$ $(r4 < r5) \vee (r6 \leq r7)$ $(r6 > r7) \vee (r8 < r9)$ $(r8 \leq r9) \vee (r10 = r11)$ $(r10 \leq r11) \vee (r12 = r13)$	$r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 20$ $r30 = 33$ $r31 = 36$	$r24 = -69$ $r25 = -47$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -54$ $r30 = -53$ $r31 = -80$
30	$r0 \leq r1$ $r1 \geq r2$ $r2 > r3$ $\#20 \leq r4$ $r4 < r5$ $r5 < r6$ $(r0 > r1) \vee (r2 \neq r3)$ $(r2 = r3) \wedge (r4 > r5)$ $(r4 < r5) \wedge (r6 > r7)$ $(r6 < r7) \vee (r8 > r9)$ $(r8 \neq \#89) \wedge (\#40 > \#90)$ $(r10 > r11) \vee (r12 \geq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 9$ $r30 = 69$ $r31 = 81$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -69$ $r24 = -74$ $r25 = -12$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -53$ $r30 = -92$ $r31 = -2$
31	$\#59 < r1$ $r1 \geq r2$ $r2 \leq r3$ $r3 \neq r4$ $r4 \leq r5$ $\#12 \leq r6$ $(\#24 \neq r1) \wedge (r2 \neq r3)$ $(r2 = r3) \wedge (r4 \neq r5)$ $(\#50 < r5) \vee (r6 > r7)$ $(\#30 > r7) \wedge (r8 = r9)$ $(r8 = r9) \vee (r10 \geq r11)$ $(r10 < r11) \vee (r12 \leq r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 34$ $r30 = 18$ $r31 = 64$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -35$ $r24 = -93$ $r25 = -13$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -37$ $r30 = -44$ $r31 = -49$
32	$r0 \geq r1$ $r1 \geq r2$ $r2 \neq r3$ $r3 < r4$ $r4 < r5$ $\#32 = r6$ $(r0 < r1) \wedge (r2 = r3)$ $(r2 \geq r3) \vee (r4 < r5)$ $(r4 = r5) \vee (r6 \neq r7)$ $(r6 \leq r7) \wedge (r8 < r9)$ $(r8 \geq r9) \vee (r10 \neq r11)$ $(r10 \leq r11) \vee (r12 > r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 78$ $r30 = 17$ $r31 = 12$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -13$ $r24 = -39$ $r25 = -15$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -36$ $r30 = -72$ $r31 = -23$
33	$r0 > r1$ $\#66 < r2$ $r2 \geq r3$ $\#4 \geq r4$ $r4 \leq \#10$ $r5 \neq \#97$ $(r0 > r1) \wedge (r2 = r3)$ $(r2 \neq r3) \wedge (r4 \geq r5)$ $(r4 \geq r5) \vee (r6 > r7)$ $(r6 \neq r7) \vee (r8 \neq r9)$ $(r8 = r9) \wedge (r10 = r11)$ $(r10 \leq r11) \wedge (r12 > r13)$	$r20 = 1$ $r21 = 1$ $r22 = 1$ $r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 8$ $r30 = 83$ $r31 = 37$	$r20 = 0$ $r21 = 0$ $r22 = 0$ $r23 = -31$ $r24 = -82$ $r25 = -52$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -95$ $r30 = -10$ $r31 = -99$
34	$r0 > r1$ $r1 < r2$ $r2 > r3$	$r20 = 1$ $r21 = 1$ $r22 = 1$	$r20 = 0$ $r21 = 0$ $r22 = 0$

	$r3 < r4$ $r4 < \#14$ $r5 \leq r6$ $(r0 \leq \#15) \vee (\#14 = \#88)$ $(r2 \leq \#92) \wedge (\#86 \leq \#41)$ $(r4 \leq r5) \wedge (r6 \geq r7)$ $(r6 \leq r7) \vee (r8 \neq r9)$ $(r8 \leq r9) \wedge (r10 \leq r11)$ $(r10 \neq r11) \vee (r12 \neq r13)$	$r23 = 1$ $r24 = 1$ $r25 = 1$ $r26 = 1$ $r27 = 1$ $r28 = 1$ $r29 = 82$ $r30 = 61$ $r31 = 63$	$r23 = -96$ $r24 = -86$ $r25 = -28$ $r26 = 0$ $r27 = 0$ $r28 = 0$ $r29 = -50$ $r30 = -57$ $r31 = -49$
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Tabela 1.3. Logika.

Grupa			
0-9	Jeśli wczytany znak	należy do	grupy znaków z Tabeli 1.4 to program przechodzi do kolejnego punktu w przeciwnym przypadku do punktu 1.2
10-19		nie należy do	
20-24		jest na skraju	
25-29		jest jednym z pierwszych sześciu znaków z	
30-34		jest jednym z ostatnich sześciu znaków	

Tabela 1.4. Znaki do zadań.

Grupa	Znaki
0	b c d e f g h i j k l m
1	o p q r s t u v w x y
2	+ , - . / 0 1 2 3 4 5 6 7
3	v w x y z [\] ^ _ `
4	> ? @ A B C D E F G H I J
5	c d e f g h i j k l m
6	# \$ % & ' () * + ,
7	Q R S T U V W X Y Z [\]
8	P Q R S T U V W X Y Z [\
9	\] ^ _ ` a b c d e f g h
10	P Q R S T U V W X Y
11	" # \$ % & ' () * + , -
12	() * + , - . / 0 1 2
13	l m n o p q r s t u
14	7 8 9 : ; < = > ? @
15	C D E F G H I J K L
16	5 6 7 8 9 : ; < = >
17	` a b c d e f g h i j k
18	A B C D E F G H I J K
19	4 5 6 7 8 9 : ; < = > ?
20	S T U V W X Y Z [\
21	g h i j k l m n o p q
22	i j k l m n o p q r s t
23	n o p q r s t u v w
24	' () * + , - . / 0 1
25	G H I J K L M N O P Q R
26	V W X Y Z [\] ^ _ ` a b
27	E F G H I J K L M N
28	> ? @ A B C D E F G H I
29	B C D E F G H I J K L M

30	Q R S T U V W X Y Z [\
31	j k l m n o p q r s
32	' () * + , - . / 0
33	E F G H I J K L M N
34	9 : ; < = > ? @ A B

Rysunek 1.1. Tablica ASCII.

Char	Ctrl	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
NUL	^@	0	00	space	32	20	@	64	40	`	96	60
SOH	^A	1	01	!	33	21	A	65	41	a	97	61
STX	^B	2	02	"	34	22	B	66	42	b	98	62
ETX	^C	3	03	#	35	23	C	67	43	c	99	63
EOT	^D	4	04	\$	36	24	D	68	44	d	100	64
ENQ	^E	5	05	%	37	25	E	69	45	e	101	65
ACK	^F	6	06	&	38	26	F	70	46	f	102	66
BEL	^G	7	07	'	39	27	G	71	47	g	103	67
BS	^H	8	08	(	40	28	H	72	48	h	104	68
HT	^I	9	09	)	41	29	I	73	49	i	105	69
LF	^J	10	0A	*	42	2A	J	74	4A	j	106	6A
VT	^K	11	0B	+	43	2B	K	75	4B	k	107	6B
FF	^L	12	0C	,	44	2C	L	76	4C	l	108	6C
CR	^M	13	0D	-	45	2D	M	77	4D	m	109	6D
SO	^N	14	0E	.	46	2E	N	78	4E	n	110	6E
SI	^O	15	0F	/	47	2F	O	79	4F	o	111	6F
DLE	^P	16	10	0	48	30	P	80	50	p	112	70
DC1	^Q	17	11	1	49	31	Q	81	51	q	113	71
DC2	^R	18	12	2	50	32	R	82	52	r	114	72
DC3	^S	19	13	3	51	33	S	83	53	s	115	73
DC4	^T	20	14	4	52	34	T	84	54	t	116	74
NAK	^U	21	15	5	53	35	U	85	55	u	117	75
SYN	^V	22	16	6	54	36	V	86	56	v	118	76
ETB	^W	23	17	7	55	37	W	87	57	w	119	77
CAN	^X	24	18	8	56	38	X	88	58	x	120	78
EM	^Y	25	19	9	57	39	Y	89	59	y	121	79
SUB	^Z	26	1A	:	58	3A	Z	90	5A	z	122	7A
ESC	^[	27	1B	;	59	3B	[	91	5B	{	123	7B
FS	^\	28	1C	<	60	3C	\	92	5C	|	124	7C
GS	^]	29	1D	=	61	3D	]	93	5D	}	125	7D
RS	^^	30	1E	>	62	3E	^	94	5E	~	126	7E
US	^_	31	1F	?	63	3F	_	95	5F	delete	127	7F

Zadanie 3 – instrukcje warunkowe, skoki

Napisać program, którego zadaniem będzie załadowanie odpowiednich wartości do rejestrów na podstawie zadanych wyrażeń.

1. Napisać program, który:
 - 1.1. Załaduje kolejno liczby do rejestrów z [Tabeli 1.1](#).
 - 1.2. Dla każdego wyrażenia z [Tabeli 1.2](#), jeśli wyrażenie jest spełnione wykona instrukcję, w odpowiadającym mu wierszu z kolumny *Jeśli prawda*, w przeciwnym przypadku z kolumny *Jeśli fałsz*.
2. Uruchomić program i upewnić się co do poprawności jego działania.
3. Utworzyć nowy dokument tekstowy. Dokument ma zawierać kolejno:
 - 3.1. Obliczony numer grupy (g).
 - 3.2. Numery i wartości rejestrów z [Tabeli 1.1](#).
 - 3.3. Wiersz z [Tabeli 1.2](#), odpowiadający numerowi grupy studenta.
 - 3.4. Zrzut ekranu przedstawiającego rejestry.
4. Ustawić okna:
 - 4.1. W lewym górnym rogu ekranu ma znajdować się program WinDlx.
 - 4.2. W lewym dolnym rogu ekranu ma znajdować się kod programu.
 - 4.3. W prawym górnym rogu ekranu ma znajdować się przygotowany dokument.
5. Wpisać się na listę: <https://goo.gl/7Y17lh> i czekać na podejście prowadzącego.

Zadanie 4 – operacje wejścia/wyjścia

Napisać program, którego zadaniem będzie wczytanie, weryfikacja i wyświetlenie znaku podanego przez użytkownika.

1. Napisać program wykonujący poniższe operacje:
 - 1.1. Przekazać tekst na standardowe wyjście:
Witaj!
Program został napisany przez Macieja Lisa z grupy I1X1S1.
Moj numer stanowiska: 1.
W miejscu imienia, nazwiska, grupy i numeru stanowiska należy wpisać wartości, które odpowiadają studentowi, który wykonuje zadanie. Wartości zmienione mają zostać wczytane dynamicznie.
 - 1.2. Wyśle na standardowe wyjście tekst:
Proszę o podanie znaku:
 - 1.3. Wczyta znak ze standardowego wejścia.
Jeśli wczytanych znaków jest więcej niż jeden program powraca do punktu 1.2.
 - 1.4. Wykona logikę określoną w tabeli [Tabela 1.3](#).
 - 1.5. Wyświetli znak podany przez użytkownika w nowej linii.
 - 1.6. Powraca do punktu 1.2.
2. Uruchomić program i upewnić się co do poprawności jego działania.
3. Utworzyć nowy dokument tekstowy. Dokument ma zawierać kolejno:
 - 3.1. Numer grupy.
 - 3.2. Zastosowaną logikę z [Tabeli 1.3](#).
 - 3.3. Znaki z [Tabeli 1.4](#), wyłącznie które dotyczą logiki.
 - 3.4. Zrzut ekranu okna wejścia/wyjścia.
Należy podać kolejno: znak błędny, dwa znaki, prawidłowy.
 - 3.5. Zrzut ekranu przedstawiającego rejestry.
4. Ustawić okna:
 - 4.1. W lewym górnym rogu ekranu ma znajdować się program WinDlx.
WinDlx ma zostać zresetowany, program załadowany i uruchomiony.
 - 4.2. W lewym dolnym rogu ekranu ma znajdować się kod programu.
 - 4.3. Z prawej strony ekranu ma znajdować się przygotowany dokument.
5. Wpisać się na listę: <https://goo.gl/7Y17lh> i czekać na podejście prowadzącego.