

### Formatted Printing: printf

Do NOT write on this test. Record all answers on the bubble sheet. **Closed book. No notes.** Work strictly from memory. **No calculators. No time limit. Scratch paper okay.**

On the following printf questions you are given a list of inputs. For each problem line determine which printf statement created the accompanying outputs. (u means space.)

Which of these printf statements created the outputs shown for each problem below? (x is int x;)

- |  |   |                                      |
|--|---|--------------------------------------|
| (A) <code>printf("uuuu%+duuu",x);</code> | (D) <code>printf("u%duuuuuu",x);</code> | (G) <code>printf("%+-8d",x);</code>  |
| (B) <code>printf("uuu%u-3duu",x);</code> | (E) <code>printf("u%05duu",x);</code>   | (H) <code>printf("%0u8d",x);</code>  |
| (C) <code>printf("uu%+5du",x);</code>    | (F) <code>printf("%u8d",x);</code>      | (I) <code>printf("%06duu",x);</code> |

inputs:	<u>9</u>	<u>-2</u>	<u>1459284759</u>	<u>-1662308468</u>
1/1p.	<u>+9uuuuuuu</u>	<u>-2uuuuuuu</u>	<u>+1459284759uu</u>	<u>-1662308468uu</u>
2/1p.	<u>uuuu9uuu</u>	<u>uuu-2uuu</u>	<u>uuuu1459284759uu</u>	<u>uuu-1662308468uu</u>
3/1p.	<u>uuuuu+9u</u>	<u>uuuuu-2u</u>	<u>uu+1459284759u</u>	<u>uu-1662308468u</u>
4/1p.	<u>uu9uuuuuuu</u>	<u>u-2uuuuuuu</u>	<u>uu1459284759uuuuuuu</u>	<u>u-1662308468uuuuuuu</u>
5/1p.	<u>uuuuuuu9</u>	<u>uuuuuuu-2</u>	<u>u1459284759</u>	<u>-1662308468</u>
6/1p.	<u>u00009uu</u>	<u>u-0002uu</u>	<u>u1459284759uu</u>	<u>u-1662308468uu</u>
7/1p.	<u>u0000009</u>	<u>-0000002</u>	<u>u1459284759</u>	<u>-1662308468</u>
8/1p.	<u>000009uu</u>	<u>-00002uu</u>	<u>1459284759uu</u>	<u>-1662308468uu</u>

Which of these printf statements created the outputs shown for each problem below? (x is int x;)

- |  |  |                                     |
|--|--|-------------------------------------|
| (A) <code>printf("uuu%04d",x);</code>  | (D) <code>printf("u%+-4duu",x);</code> | (G) <code>printf("%-6d",x);</code>  |
| (B) <code>printf("uuu%2duu",x);</code> | (E) <code>printf("u%-5du",x);</code>   | (H) <code>printf("%0+7d",x);</code> |
| (C) <code>printf("uu%u-4du",x);</code> | (F) <code>printf("u%6d",x);</code>     | (I) <code>printf("%07d",x);</code>  |

inputs:	<u>4</u>	<u>-3</u>	<u>1422389026</u>	<u>-1320354952</u>
9/1p.	<u>uuuu4uu</u>	<u>uuu-3uu</u>	<u>uuu1422389026uu</u>	<u>uuu-1320354952uu</u>
10/1p.	<u>uuuuuuu4</u>	<u>uuuuu-3</u>	<u>u1422389026</u>	<u>u-1320354952</u>
11/1p.	<u>4uuuuuuu</u>	<u>-3uuuuu</u>	<u>1422389026u</u>	<u>-1320354952u</u>
12/1p.	<u>0000004</u>	<u>-00003</u>	<u>1422389026</u>	<u>-1320354952</u>
13/1p.	<u>uuu4uuu</u>	<u>uu-3uuu</u>	<u>uuu1422389026u</u>	<u>uu-1320354952u</u>
14/1p.	<u>u+4uuu</u>	<u>u-3uuu</u>	<u>u+1422389026uu</u>	<u>u-1320354952uu</u>
15/1p.	<u>u4uuuuu</u>	<u>u-3uuuu</u>	<u>u1422389026u</u>	<u>u-1320354952u</u>
16/1p.	<u>uuu0004</u>	<u>uuu-003</u>	<u>uuu1422389026</u>	<u>uuu-1320354952</u>

Which of these printf statements created the outputs shown for each problem below? (x is int x;)

- |  |   |   |
|--|---|---|
| (A) <code>printf("uuu%+03duuu",x);</code>  | (D) <code>printf("uu%u-4duuu",x);</code>  | (G) <code>printf("u%u05duuu",x);</code> |
| (B) <code>printf("uu%u06d",x);</code>      | (E) <code>printf("uu%02duuuuu",x);</code> | (H) <code>printf("u%u+6duu",x);</code>  |
| (C) <code>printf("uu%u+duuuuuu",x);</code> | (F) <code>printf("u%u-8d",x);</code>      | (I) <code>printf("u%u8d",x);</code>     |

inputs:	<u>0</u>	<u>-9</u>	<u>1672455513</u>	<u>-1505829951</u>
17/1p.	<u>uu+0uuuuuuu</u>	<u>uu-9uuuuuuu</u>	<u>uu+1672455513uuuuuu</u>	<u>uu-1505829951uuuuuu</u>
18/1p.	<u>uuuuu+0uu</u>	<u>uuuuu-9uu</u>	<u>u+1672455513uu</u>	<u>u-1505829951uu</u>
19/1p.	<u>uu0uuuuuuu</u>	<u>uu-9uuuuuu</u>	<u>uu1672455513uuu</u>	<u>uu-1505829951uuu</u>
20/1p.	<u>uu0000uuu</u>	<u>u-0009uuu</u>	<u>uu1672455513uuu</u>	<u>u-1505829951uuu</u>
21/1p.	<u>uuu+0uuu</u>	<u>uuu-09uuu</u>	<u>uuu+1672455513uuu</u>	<u>uuu-1505829951uuu</u>
22/1p.	<u>uuu00000u</u>	<u>uu-00009u</u>	<u>uuu1672455513u</u>	<u>uu-1505829951u</u>
23/1p.	<u>uu0uuuuuuu</u>	<u>u-9uuuuuuu</u>	<u>uu1672455513</u>	<u>u-1505829951</u>
24/1p.	<u>uuuuuuuuu0</u>	<u>uuuuuuuuu-9</u>	<u>u1672455513</u>	<u>u-1505829951</u>

Which of these printf statements created the outputs shown for each problem below? (x is `char * x` ;)

- (A) `printf("uuuu%-2suuu",x);`   (D) `printf("u%-3suumu",x);`   (G) `printf("%-7s",x);`  
 (B) `printf("uuuu%3su",x);`   (E) `printf("u%-5su",x);`   (H) `printf("%5suu",x);`  
 (C) `printf("uu%2suumu",x);`   (F) `printf("u%4suu",x);`   (I) `printf("%7s",x);`

inputs:	<u>"</u>	<u>"x"</u>	<u>"vq"</u>	<u>"qpkg"</u>	<u>"zckvpg"</u>	<u>"ywkdpbqd"</u>
25/1p.	uuuuuuuu	uuuuuuuu <u>x</u>	uuuuuu <u>vq</u>	uuuu <u>qpkg</u>	uu <u>zckvpg</u>	<u>ywkdpbqd</u>
26/1p.	uuuuuuuu	uuuu <u>xuuu</u>	uuuu <u>vquu</u>	uuuu <u>qpkguu</u>	uuuu <u>zckvpguu</u>	uuuu <u>ywkdpbqduu</u>
27/1p.	uuuuuuuu	<u>xuuuuuuu</u>	<u>vquuuuuu</u>	<u>qpkguuuu</u>	<u>zckvpgu</u>	<u>ywkdpbqd</u>
28/1p.	uuuuuuuu	uuuuuu <u>xu</u>	uuuuuu <u>vqu</u>	uuuu <u>qpkgu</u>	uuuu <u>zckvpgu</u>	uuuu <u>ywkdpbqd</u>
29/1p.	uuuuuuuu	uuuuuu <u>xuu</u>	uuuu <u>vquu</u>	uu <u>qpkguu</u>	uu <u>zckvpguu</u>	uu <u>ywkdpbqduu</u>
30/1p.	uuuuuuuu	uuuuuu <u>xuuu</u>	uuuu <u>vquuu</u>	uu <u>qpkguu</u>	uu <u>zckvpgu</u>	uu <u>ywkdpbqd</u>

Which of these printf statements created the outputs shown for each problem below? (x is `char * x` ;)

- (A) `printf("uuuu%su",x);`   (D) `printf("u%-3su",x);`   (G) `printf("%-2suumu",x);`  
 (B) `printf("uuu%suu",x);`   (E) `printf("u%-4su",x);`   (H) `printf("%4su",x);`  
 (C) `printf("uu%1suuu",x);`   (F) `printf("u%3su",x);`   (I) `printf("%5s",x);`

inputs:	<u>"</u>	<u>"z"</u>	<u>"cq"</u>	<u>"ldbz"</u>	<u>"wgvvgx"</u>	<u>"qycpdygx"</u>
31/1p.	uuuuuu	<u>uZuuu</u>	<u>ucquu</u>	<u>uldbz</u>	<u>wgvvvx</u>	<u>qycpdygx</u>
32/1p.	uuuuuu	<u>uZuuu</u>	<u>ucquu</u>	<u>uldbzu</u>	<u>wgvvgxu</u>	<u>qycpdygxu</u>
33/1p.	uuuuuu	<u>uuuZuu</u>	<u>uuucquu</u>	<u>uuuldbzu</u>	<u>uuuwgvvgxuu</u>	<u>uuuqycpdygxuu</u>
34/1p.	uuuuuu	<u>uuuuZu</u>	<u>uuuuucqu</u>	<u>uuuuuldbzu</u>	<u>uuuuwgvvgxu</u>	<u>uuuuqycpdygxu</u>
35/1p.	uuuuuu	<u>uuuuzu</u>	<u>uuucqu</u>	<u>lbdzu</u>	<u>wgvvgxu</u>	<u>qycpdygxu</u>

Which of these printf statements created the outputs shown for each problem below? (x is `double x` ;)

- (A) `printf("uuu%+10.0f",x);`   (D) `printf("u%12.4f",x);`   (G) `printf("%+14.0f",x);`  
 (B) `printf("uu%+11.0f",x);`   (E) `printf("%+012.2fuu",x);`   (H) `printf("%+14f",x);`  
 (C) `printf("u%012.2f",x);`   (F) `printf("%+014f",x);`   (I) `printf("%12fuu",x);`

inputs:	<u>7</u>	<u>-4.04</u>	<u>6.6584</u>	<u>-396722.213188</u>
36/1p.	<u>u0000007.0000u</u>	<u>-000004.0400u</u>	<u>u0000006.6584u</u>	<u>-396722.2132u</u>
37/1p.	<u>uuuuuuuuuuu+7u</u>	<u>uuuuuuuuuuu-4u</u>	<u>uuuuuuuuuuu+7u</u>	<u>uuuuuuu-396722u</u>
38/1p.	<u>uuuu7.000000uu</u>	<u>uuu-4.040000uu</u>	<u>uuuu6.658400uu</u>	<u>-396722.213188uu</u>
39/1p.	<u>uu+0000000007u</u>	<u>uu-0000000004u</u>	<u>uu+0000000007u</u>	<u>uu-0000396722u</u>
40/1p.	<u>+00000007.00uu</u>	<u>-00000004.04uu</u>	<u>+00000006.66uu</u>	<u>-00396722.21uu</u>
41/1p.	<u>u000000007.00u</u>	<u>u-00000004.04u</u>	<u>u000000006.66u</u>	<u>u-00396722.21u</u>

Which of these printf statements created the outputs shown for each problem below? (x is `double x` ;)

- (A) `printf("uuu%0+11f",x);`   (D) `printf("u%012.4f",x);`   (G) `printf("%014.4f",x);`  
 (B) `printf("uu%+12.4f",x);`   (E) `printf("%+13.2fuu",x);`   (H) `printf("%13.0fuu",x);`  
 (C) `printf("u%+010.6fuuu",x);`   (F) `printf("%0+14.2f",x);`   (I) `printf("%14.2f",x);`

inputs:	<u>7</u>	<u>5.88</u>	<u>2.0720</u>	<u>-579077.437408</u>
42/1p.	<u>uuuuuuu+7.0000</u>	<u>uuuuuuu+5.8800</u>	<u>uuuuuuu+2.0720</u>	<u>uu-579077.4374</u>
43/1p.	<u>uuu+007.000000</u>	<u>uuu+005.880000</u>	<u>uuu+002.072000</u>	<u>uuu-579077.437408</u>
44/1p.	<u>+0000000007.00</u>	<u>+0000000005.88</u>	<u>+0000000002.07</u>	<u>-0000579077.44</u>
45/1p.	<u>uuuuuuuuu+7.00</u>	<u>uuuuuuuuu+5.88</u>	<u>uuuuuuuuu+2.07</u>	<u>uuuu-579077.44</u>
46/1p.	<u>u+07.000000uuu</u>	<u>u+05.880000uuu</u>	<u>u+02.072000uuu</u>	<u>u-579077.437408uuu</u>
47/1p.	<u>u0000007.0000u</u>	<u>u0000005.8800u</u>	<u>u0000002.0720u</u>	<u>u-579077.4374u</u>

Total points 47.

**Answer Key** (points per line)

1 (1).	G	25 (1).	I
2 (1).	B	26 (1).	A
3 (1).	C	27 (1).	G
4 (1).	D	28 (1).	B
5 (1).	F	29 (1).	F
6 (1).	E	30 (1).	E
7 (1).	H	31 (1).	E
8 (1).	I	32 (1).	D
9 (1).	B	33 (1).	B
10 (1).	F	34 (1).	A
11 (1).	G	35 (1).	H
12 (1).	I	36 (1).	D
13 (1).	C	37 (1).	A
14 (1).	D	38 (1).	I
15 (1).	E	39 (1).	B
16 (1).	A	40 (1).	E
17 (1).	C	41 (1).	C
18 (1).	H	42 (1).	B
19 (1).	D	43 (1).	A
20 (1).	G	44 (1).	F
21 (1).	A	45 (1).	I
22 (1).	B	46 (1).	C
23 (1).	F	47 (1).	D
24 (1).	I		

Total points 47.