

### 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. (   means space.)

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

- |                                      |                                     |                                    |
|--------------------------------------|-------------------------------------|------------------------------------|
| (A) <code>printf("uuuu%u",x);</code> | (D) <code>printf("%-3d",x);</code>  | (G) <code>printf("%+7d",x);</code> |
| (B) <code>printf("u%05d",x);</code>  | (E) <code>printf("%-6d",x);</code>  | (H) <code>printf("%+8d",x);</code> |
| (C) <code>printf("uu%3d",x);</code>  | (F) <code>printf("%u-7d",x);</code> | (I) <code>printf("%8d",x);</code>  |

inputs:	<u>9</u>	<u>-8</u>	<u>1432258278</u>	<u>-1620260045</u>
1/1p.	<u>  </u> 00009 <u>  </u>	<u>  </u> -0008 <u>  </u>	<u>  </u> 1432258278 <u>  </u>	<u>  </u> -1620260045 <u>  </u>
2/1p.	<u>      </u> 9	<u>      </u> -8	1432258278	-1620260045
3/1p.	<u>      </u> +9	<u>      </u> -8	+1432258278	-1620260045
4/1p.	<u>      </u> +9 <u>  </u>	<u>      </u> -8 <u>  </u>	+1432258278 <u>  </u>	-1620260045 <u>  </u>
5/1p.	<u>  </u> 9 <u>      </u>	<u>  </u> -8 <u>      </u>	<u>  </u> 1432258278 <u>      </u>	<u>  </u> -1620260045 <u>      </u>
6/1p.	<u>      </u> 9 <u>      </u>	<u>      </u> -8 <u>      </u>	<u>      </u> 1432258278 <u>      </u>	<u>      </u> -1620260045 <u>      </u>
7/1p.	<u>  </u> 9 <u>      </u>	<u>  </u> -8 <u>      </u>	<u>  </u> 1432258278 <u>      </u>	<u>  </u> -1620260045 <u>      </u>
8/1p.	<u>      </u> 9 <u>      </u>	<u>      </u> -8 <u>      </u>	<u>      </u> 1432258278 <u>      </u>	<u>      </u> -1620260045 <u>      </u>

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

- |  |                                    |                                     |
|--|------------------------------------|-------------------------------------|
| (A) <code>printf("uuuu%3d",x);</code>  | (D) <code>printf("u%4d",x);</code> | (G) <code>printf("%09d",x);</code>  |
| (B) <code>printf("uuuu%05d",x);</code> | (E) <code>printf("%-7d",x);</code> | (H) <code>printf("%-10d",x);</code> |
| (C) <code>printf("uu%-7d",x);</code>   | (F) <code>printf("%+9d",x);</code> | (I) <code>printf("%08d",x);</code>  |

inputs:	<u>4</u>	<u>-6</u>	<u>1864788978</u>	<u>-1596288316</u>
9/1p.	<u>      </u> 4 <u>  </u>	<u>      </u> -6 <u>  </u>	<u>      </u> 1864788978 <u>  </u>	<u>      </u> -1596288316 <u>  </u>
10/1p.	<u>  </u> 000000004	<u>  </u> -00000006	<u>  </u> 1864788978	<u>  </u> -1596288316
11/1p.	<u>  </u> +4 <u>      </u>	<u>  </u> -6 <u>      </u>	<u>  </u> +1864788978	<u>  </u> -1596288316
12/1p.	<u>      </u> 4 <u>      </u>	<u>      </u> -6 <u>      </u>	<u>      </u> 1864788978 <u>  </u>	<u>      </u> -1596288316 <u>  </u>
13/1p.	<u>  </u> 4 <u>      </u>	<u>  </u> -6 <u>      </u>	<u>  </u> 1864788978	-1596288316
14/1p.	<u>      </u> 004 <u>  </u>	<u>      </u> -006 <u>  </u>	<u>      </u> 1864788978 <u>  </u>	<u>      </u> -1596288316 <u>  </u>
15/1p.	<u>      </u> 4 <u>  </u>	<u>      </u> -6 <u>  </u>	<u>      </u> 1864788978 <u>  </u>	<u>      </u> -1596288316 <u>  </u>
16/1p.	0000004 <u>  </u>	-0000006 <u>  </u>	1864788978 <u>  </u>	-1596288316 <u>  </u>

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

- |  |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| (A) <code>printf("uuuu%+3d",x);</code> | (D) <code>printf("u%5d",x);</code>  | (G) <code>printf("%07d",x);</code>  |
| (B) <code>printf("uuu%02d",x);</code>  | (E) <code>printf("%-+5d",x);</code> | (H) <code>printf("%+07d",x);</code> |
| (C) <code>printf("uu%4d",x);</code>    | (F) <code>printf("%3d",x);</code>   | (I) <code>printf("%-+7d",x);</code> |

inputs:	<u>1</u>	<u>-7</u>	<u>1846225329</u>	<u>-2024817078</u>
17/1p.	<u>  </u> 000001	<u>  </u> -000007	<u>  </u> 1846225329	<u>  </u> -2024817078
18/1p.	<u>      </u> 1	<u>      </u> -7	<u>      </u> 1846225329	<u>      </u> -2024817078
19/1p.	<u>  </u> 01 <u>  </u>	<u>  </u> -7 <u>  </u>	<u>  </u> 1846225329 <u>  </u>	<u>  </u> -2024817078 <u>  </u>
20/1p.	<u>      </u> 1 <u>  </u>	<u>      </u> -7 <u>  </u>	<u>      </u> 1846225329 <u>  </u>	<u>      </u> -2024817078 <u>  </u>
21/1p.	+000001	-000007	+1846225329	-2024817078
22/1p.	<u>      </u> +1 <u>  </u>	<u>      </u> -7 <u>  </u>	<u>      </u> +1846225329	<u>      </u> -2024817078
23/1p.	<u>  </u> +1 <u>  </u>	<u>  </u> -7 <u>  </u>	<u>  </u> +1846225329	<u>  </u> -2024817078
24/1p.	<u>      </u> +1 <u>  </u>	<u>      </u> -7 <u>  </u>	<u>      </u> +1846225329	<u>      </u> -2024817078

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

- (A) `printf("uuuuuu%1s",x);`   (D) `printf("uu%-4s",x);`   (G) `printf("%-5s",x);`  
 (B) `printf("uuu%2s",x);`   (E) `printf("uu%suuuuu",x);`   (H) `printf("%-6s",x);`  
 (C) `printf("uuu%3s",x);`   (F) `printf("u%5s",x);`   (I) `printf("%7s",x);`

inputs:	<u>"</u>	<u>"l"</u>	<u>"vd"</u>	<u>"wdhh"</u>	<u>"dzxllk"</u>	<u>"ppxhhqvq"</u>
25/1p.	uuuuuuuu	uuuuuuu <u>l</u>	uuuu <u>vd</u>	uuu <u>wdhh</u>	u <u>dzxllk</u>	<u>ppxhhqvq</u>
26/1p.	uuuuuuuu	uuuuuu <u>l</u> u	uuuu <u>vd</u> u	uu <u>wdhh</u> u	u <u>dzxllk</u> u	<u>ppxhhqvq</u> u
27/1p.	uuuuuuuu	l <u>uuuuuuu</u>	vd <u>uuuuu</u>	wdhh <u>uuu</u>	dzxllk <u>uu</u>	<u>ppxhhqvq</u> uu
28/1p.	uuuuuuuu	uuuuuu <u>l</u> u	uuuu <u>vd</u> u	uuu <u>wdhh</u> u	uuu <u>dzxllk</u> u	<u>uuu</u> ppxhhqvq <u>uuu</u>
29/1p.	uuuuuuuu	u <u>u</u> l <u>uuuuu</u>	u <u>v</u> d <u>uuuuu</u>	u <u>w</u> d <u>hh</u> u <u>uuuuu</u>	u <u>u</u> dzxllk <u>uuuuu</u>	<u>u</u> u <u>ppxhhqvq</u> uuuuuu
30/1p.	uuuuuuuu	u <u>u</u> l <u>uuuu</u>	u <u>v</u> d <u>uuu</u>	u <u>w</u> d <u>hh</u> u	u <u>u</u> dzxllk <u>u</u>	<u>u</u> u <u>ppxhhqvq</u> u

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

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

inputs:	<u>"</u>	<u>"z"</u>	<u>"wx"</u>	<u>"dlyj"</u>	<u>"qcbplw"</u>	<u>"zzwxwffk"</u>
31/1p.	uuuu	z <u>uuu</u>	wx <u>uu</u>	dlyj	qcbplw	zzwxwffk
32/1p.	uuuu	uuu <u>z</u>	u <u>wx</u>	dlyj	qcbplw	zzwxwffk
33/1p.	uuuu	z <u>uuu</u>	wx <u>uu</u>	dlyju	qcbplw <u>u</u>	zzwxwffk <u>u</u>
34/1p.	uuuu	uu <u>z</u> u	u <u>wx</u> u	dlyju	qcbplw <u>u</u>	zzwxwffk <u>u</u>
35/1p.	uuuu	uu <u>z</u> uu	u <u>wx</u> uu	u <u>dlyj</u> uu	u <u>qcbplw</u> uu	u <u>u</u> zwxwffk <u>uu</u>

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

- (A) `printf("uu%012.0f",x);`   (D) `printf("u%10.0fuuu",x);`   (G) `printf("%+014.4f",x);`  
 (B) `printf("uu%11.4f`u`",x);`   (E) `printf("u%11fuu",x);`   (H) `printf("%+13.2f`u`",x);`  
 (C) `printf("u%+013.2f",x);`   (F) `printf("%+012fuu",x);`   (I) `printf("%14.0f",x);`

inputs:	<u>9</u>	<u>-1.45</u>	<u>2.0551</u>	<u>-251017.790849</u>
36/1p.	uuuu9.000000uu	uuu-1.450000uu	uuuu2.055100uu	u-251017.790849uu
37/1p.	uu000000000009	uu-000000000001	uu000000000002	uu-00000251018
38/1p.	uuuuuuu+9.00u	uuuuuuu-1.45u	uuuuuuu+2.06u	uuu-251017.79u
39/1p.	uuuuuuu9.0000u	uuuuuuu-1.4500u	uuuuuuu2.0551u	uu-251017.7908u
40/1p.	uuuuuuuuuuuuu9	uuuuuuuuuuuuu-1	uuuuuuuuuuuuu2	uuuuuuu-251018
41/1p.	+00000009.0000	-00000001.4500	+00000002.0551	-00251017.7908

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

- (A) `printf("uu%011.6f`u`",x);`   (D) `printf("u%0+12.2f`u`",x);`   (G) `printf("%0+14f",x);`  
 (B) `printf("uu%10fuu",x);`   (E) `printf("u%0+13.0f",x);`   (H) `printf("%10.6fuuuu",x);`  
 (C) `printf("u%+011.0fuu",x);`   (F) `printf("u%012f`u`",x);`   (I) `printf("%11.4fuuu",x);`

inputs:	<u>1</u>	<u>8.40</u>	<u>-1.6226</u>	<u>-188363.206280</u>
42/1p.	u00001.000000u	u00008.400000u	u-0001.622600u	u-188363.206280u
43/1p.	u00001.000000u	u0008.400000u	u-001.622600u	u-188363.206280u
44/1p.	u+000000000001	u+000000000008	u-000000000002	u-000000188363
45/1p.	+000001.000000	+000008.400000	-000001.622600	-188363.206280
46/1p.	u+0000000001uu	u+0000000008uu	u-0000000002uu	u-0000188363uu
47/1p.	u1.000000uuuu	u8.400000uuuu	u-1.622600uuuu	-188363.206280uuuu

Total points 47.

**Answer Key** (points per line)

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

Total points 47.