

## **Program Traces:**

For 11 blocks and 5 stacks

Original State :

1 | C

2 | D E I K

3 | A

4 | J

5 | B F G H

iter=1, f=g+h=70, depth =0

iter=2, f=g+h=49, depth =1

iter=3, f=g+h=46, depth =2

iter=4, f=g+h=45, depth =3

iter=5, f=g+h=45, depth =3

iter=6, f=g+h=46, depth =2

iter=7, f=g+h=45, depth =3

iter=8, f=g+h=45, depth =3

iter=9, f=g+h=46, depth =4

iter=10, f=g+h=46, depth =4

iter=11, f=g+h=46, depth =4

iter=12, f=g+h=46, depth =4

iter=13, f=g+h=46, depth =4

iter=14, f=g+h=46, depth =4

iter=15, f=g+h=46, depth =4

iter=16, f=g+h=46, depth =4

iter=17, f=g+h=47, depth =3

iter=18, f=g+h=47, depth =3

iter=19, f=g+h=47, depth =3

iter=20, f=g+h=47, depth =5

iter=21, f=g+h=47, depth =5

iter=22, f=g+h=47, depth =5

iter=23, f=g+h=47, depth =5

iter=24, f=g+h=47, depth =3

iter=25, f=g+h=47, depth =3

iter=26, f=g+h=47, depth =5

iter=27, f=g+h=47, depth =5

iter=28, f=g+h=47, depth =5

iter=29, f=g+h=47, depth =3

iter=30, f=g+h=47, depth =5

iter=31, f=g+h=47, depth =5

iter=32, f=g+h=47, depth =5

iter=33, f=g+h=47, depth =5

iter=34, f=g+h=47, depth =5  
iter=35, f=g+h=47, depth =5  
iter=36, f=g+h=47, depth =5  
iter=37, f=g+h=47, depth =5  
iter=38, f=g+h=47, depth =5  
iter=39, f=g+h=48, depth =2  
iter=40, f=g+h=47, depth =3  
iter=41, f=g+h=46, depth =4  
iter=42, f=g+h=46, depth =4  
iter=43, f=g+h=47, depth =5  
iter=44, f=g+h=47, depth =5  
iter=45, f=g+h=47, depth =5  
iter=46, f=g+h=47, depth =5  
iter=47, f=g+h=48, depth =6  
iter=48, f=g+h=48, depth =6  
iter=49, f=g+h=48, depth =4  
iter=50, f=g+h=48, depth =4  
iter=51, f=g+h=48, depth =6  
iter=52, f=g+h=48, depth =6  
iter=53, f=g+h=48, depth =6  
iter=54, f=g+h=48, depth =6  
iter=55, f=g+h=48, depth =4  
iter=56, f=g+h=48, depth =4  
iter=57, f=g+h=48, depth =6  
iter=58, f=g+h=48, depth =6  
iter=59, f=g+h=48, depth =6  
iter=60, f=g+h=48, depth =4  
iter=61, f=g+h=48, depth =4  
iter=62, f=g+h=48, depth =6  
iter=63, f=g+h=48, depth =6  
iter=64, f=g+h=48, depth =4  
iter=65, f=g+h=48, depth =6  
iter=66, f=g+h=48, depth =6  
iter=67, f=g+h=48, depth =4  
iter=68, f=g+h=48, depth =4  
iter=69, f=g+h=48, depth =4  
iter=70, f=g+h=48, depth =4  
iter=71, f=g+h=48, depth =4  
iter=72, f=g+h=48, depth =6  
iter=73, f=g+h=48, depth =4  
iter=74, f=g+h=48, depth =4  
iter=75, f=g+h=48, depth =6  
iter=76, f=g+h=48, depth =4

iter=77, f=g+h=48, depth =6  
iter=78, f=g+h=48, depth =2  
iter=79, f=g+h=47, depth =3  
iter=80, f=g+h=46, depth =4  
iter=81, f=g+h=46, depth =4  
iter=82, f=g+h=47, depth =5  
iter=83, f=g+h=47, depth =5  
iter=84, f=g+h=47, depth =5  
iter=85, f=g+h=47, depth =5  
iter=86, f=g+h=48, depth =4  
iter=87, f=g+h=48, depth =4  
iter=88, f=g+h=48, depth =4  
iter=89, f=g+h=48, depth =6  
iter=90, f=g+h=48, depth =6  
iter=91, f=g+h=48, depth =6  
iter=92, f=g+h=48, depth =6  
iter=93, f=g+h=48, depth =6  
iter=94, f=g+h=48, depth =6  
iter=95, f=g+h=48, depth =6  
iter=96, f=g+h=48, depth =6  
iter=97, f=g+h=48, depth =6  
iter=98, f=g+h=48, depth =6  
iter=99, f=g+h=48, depth =6  
iter=100, f=g+h=48, depth =4  
iter=101, f=g+h=48, depth =6  
iter=102, f=g+h=48, depth =6  
iter=103, f=g+h=48, depth =4  
iter=104, f=g+h=48, depth =6  
iter=105, f=g+h=48, depth =6  
iter=106, f=g+h=48, depth =6  
iter=107, f=g+h=48, depth =6  
iter=108, f=g+h=48, depth =6  
iter=109, f=g+h=48, depth =6  
iter=110, f=g+h=48, depth =6  
iter=111, f=g+h=48, depth =4  
iter=112, f=g+h=48, depth =4  
iter=113, f=g+h=49, depth =5  
iter=114, f=g+h=49, depth =3  
iter=115, f=g+h=46, depth =4  
iter=116, f=g+h=47, depth =5  
iter=117, f=g+h=47, depth =5  
iter=118, f=g+h=47, depth =5  
iter=119, f=g+h=48, depth =4

iter=120, f=g+h=47, depth =5  
iter=121, f=g+h=47, depth =5  
iter=122, f=g+h=48, depth =6  
iter=123, f=g+h=48, depth =6  
iter=124, f=g+h=48, depth =6  
iter=125, f=g+h=48, depth =6  
iter=126, f=g+h=48, depth =6  
iter=127, f=g+h=48, depth =4  
iter=128, f=g+h=43, depth =5  
iter=129, f=g+h=42, depth =6  
iter=130, f=g+h=42, depth =6  
iter=131, f=g+h=42, depth =6  
iter=132, f=g+h=43, depth =7  
iter=133, f=g+h=43, depth =7  
iter=134, f=g+h=43, depth =7  
iter=135, f=g+h=43, depth =7  
iter=136, f=g+h=43, depth =7  
iter=137, f=g+h=43, depth =7  
iter=138, f=g+h=43, depth =7  
iter=139, f=g+h=43, depth =7  
iter=140, f=g+h=43, depth =7  
iter=141, f=g+h=43, depth =7  
iter=142, f=g+h=43, depth =7  
iter=143, f=g+h=43, depth =7  
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iter=145, f=g+h=44, depth =8  
iter=146, f=g+h=44, depth =8  
iter=147, f=g+h=44, depth =8  
iter=148, f=g+h=44, depth =8  
iter=149, f=g+h=44, depth =8  
iter=150, f=g+h=44, depth =8  
iter=151, f=g+h=44, depth =8  
iter=152, f=g+h=44, depth =8  
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iter=154, f=g+h=44, depth =8  
iter=155, f=g+h=44, depth =8  
iter=156, f=g+h=44, depth =8  
iter=157, f=g+h=44, depth =8  
iter=158, f=g+h=44, depth =8  
iter=159, f=g+h=44, depth =8  
iter=160, f=g+h=44, depth =8  
iter=161, f=g+h=44, depth =8  
iter=162, f=g+h=45, depth =5

iter=163, f=g+h=42, depth =6  
iter=164, f=g+h=43, depth =7  
iter=165, f=g+h=43, depth =7  
iter=166, f=g+h=43, depth =7  
iter=167, f=g+h=43, depth =7  
iter=168, f=g+h=44, depth =6  
iter=169, f=g+h=43, depth =7  
iter=170, f=g+h=43, depth =7  
iter=171, f=g+h=43, depth =7  
iter=172, f=g+h=44, depth =8  
iter=173, f=g+h=44, depth =8  
iter=174, f=g+h=44, depth =8  
iter=175, f=g+h=44, depth =8  
iter=176, f=g+h=44, depth =6  
iter=177, f=g+h=43, depth =7  
iter=178, f=g+h=44, depth =8  
iter=179, f=g+h=44, depth =8  
iter=180, f=g+h=44, depth =8  
iter=181, f=g+h=44, depth =8  
iter=182, f=g+h=44, depth =8  
iter=183, f=g+h=44, depth =8  
iter=184, f=g+h=44, depth =8  
iter=185, f=g+h=44, depth =8  
iter=186, f=g+h=44, depth =8  
iter=187, f=g+h=44, depth =8  
iter=188, f=g+h=44, depth =8  
iter=189, f=g+h=44, depth =8  
iter=190, f=g+h=45, depth =7  
iter=191, f=g+h=44, depth =8  
iter=192, f=g+h=44, depth =8  
iter=193, f=g+h=45, depth =7  
iter=194, f=g+h=45, depth =7  
iter=195, f=g+h=45, depth =7  
iter=196, f=g+h=44, depth =8  
iter=197, f=g+h=44, depth =8  
iter=198, f=g+h=45, depth =7  
iter=199, f=g+h=45, depth =7  
iter=200, f=g+h=45, depth =7  
iter=201, f=g+h=44, depth =8  
iter=202, f=g+h=44, depth =8  
iter=203, f=g+h=44, depth =8  
iter=204, f=g+h=39, depth =9  
iter=205, f=g+h=36, depth =10

iter=206, f=g+h=35, depth =11  
iter=207, f=g+h=36, depth =10  
iter=208, f=g+h=35, depth =11  
iter=209, f=g+h=37, depth =11  
iter=210, f=g+h=36, depth =12  
iter=211, f=g+h=33, depth =13  
iter=212, f=g+h=30, depth =14  
iter=213, f=g+h=29, depth =15  
iter=214, f=g+h=26, depth =16  
iter=215, f=g+h=25, depth =17  
iter=216, f=g+h=24, depth =18  
iter=217, f=g+h=23, depth =19  
iter=218, f=g+h=22, depth =20  
iter=219, f=g+h=21, depth =21

Success! depth=21, total\_goal\_tests=219, max\_queue\_size=2304

Solution steps : 21

Step 0:

1 | C  
2 | D E I K  
3 | A  
4 | J  
5 | B F G H

Step 1:

1 |  
2 | D E I K  
3 | A C  
4 | J  
5 | B F G H

Step 2:

1 |  
2 | D E I  
3 | A C  
4 | J K  
5 | B F G H

Step 3:

1 |  
2 | D E I  
3 | A  
4 | J K C  
5 | B F G H

Step 4:

1 | A  
2 | D E I

3 |  
4 | J K C  
5 | B F G H

Step 5:

1 | A  
2 | D E I  
3 | H  
4 | J K C  
5 | B F G

Step 6:

1 | A  
2 | D E I  
3 | H G  
4 | J K C  
5 | B F

Step 7:

1 | A  
2 | D E I  
3 | H G F  
4 | J K C  
5 | B

Step 8:

1 | A B  
2 | D E I  
3 | H G F  
4 | J K C  
5 |

Step 9:

1 | A B C  
2 | D E I  
3 | H G F  
4 | J K  
5 |

Step 10:

1 | A B C  
2 | D E  
3 | H G F  
4 | J K  
5 | I

Step 11:

1 | A B C  
2 | D  
3 | H G F

4 | J K

5 | I E

Step 12:

1 | A B C D

2 |

3 | H G F

4 | J K

5 | I E

Step 13:

1 | A B C D

2 | F

3 | H G

4 | J K

5 | I E

Step 14:

1 | A B C D E

2 | F

3 | H G

4 | J K

5 | I

Step 15:

1 | A B C D E F

2 |

3 | H G

4 | J K

5 | I

Step 16:

1 | A B C D E F G

2 |

3 | H

4 | J K

5 | I

Step 17:

1 | A B C D E F G H

2 |

3 |

4 | J K

5 | I

Step 18:

1 | A B C D E F G H

2 | K

3 |

4 | J



5 | I

Step 19:

1 | A B C D E F G H I

2 | K

3 |

4 | J

5 |

Step 20:

1 | A B C D E F G H I J

2 | K

3 |

4 |

5 |

Step 21:

1 | A B C D E F G H I J K

2 |

3 |

4 |

5 |

### For 5 Block 3 Stacks

c:\Anuj\Test\src>java BlocksWorld 5 3

Original State :

1 | B

2 | A C E

3 | D

iter=1, f=g+h=28, depth =0

iter=2, f=g+h=19, depth =1

iter=3, f=g+h=20, depth =2

iter=4, f=g+h=23, depth =1

iter=5, f=g+h=25, depth =3

iter=6, f=g+h=24, depth =4

iter=7, f=g+h=19, depth =5

iter=8, f=g+h=18, depth =6

iter=9, f=g+h=15, depth =7

iter=10, f=g+h=16, depth =8

iter=11, f=g+h=15, depth =9

iter=12, f=g+h=14, depth =10

iter=13, f=g+h=13, depth =11

iter=14, f=g+h=12, depth =12

Success! depth=12, total\_goal\_tests=14, max\_queue\_size=28

Solution steps : 12

Step 0:

1 | B

2 | A C E

3 | D

Step 1:

1 |

2 | A C E

3 | D B

Step 2:

1 |

2 | A C

3 | D B E

Step 3:

1 |

2 | A

3 | D B E C

Step 4:

1 | A

2 |

3 | D B E C

Step 5:

1 | A

2 | C

3 | D B E

Step 6:

1 | A

2 | C E

3 | D B

Step 7:

1 | A B

2 | C E

3 | D

Step 8:

1 | A B

2 | C

3 | D E

Step 9:

1 | A B C

2 |

3 | D E

Step 10:

1 | A B C

2 | E

3 | D

Step 11:

1 | A B C D

2 | E

3 |

Step 12:

1 | A B C D E

2 |

3 |