

```
1: #!/afs/cats.ucsc.edu/courses/cmps112-wm/usr/smalltalk/bin/gst -f
2: "$Id: outbits.st,v 1.9 2016-10-26 13:50:03-07 - - $"
3: execname := '$RCSfile: outbits.st,v $' =~ '.*: (.*)v.*' at: 1.
4:
5: ""
6: " Opens a file given as the first argument and writes out bits."
7: ""
8:
9: nl := Character nl.
10:
11: Object subclass: OutBits [
12:   |bitIndex currentByte myStream|
13:   OutBits class >> new [
14:     self shouldNotImplement.
15:   ]
16:   OutBits class >> new: fileStream [
17:     |result|
18:     result := super new.
19:     result init: fileStream.
20:     ^result
21:   ]
22:   clearByte [
23:     bitIndex := 8.
24:     currentByte := 0.
25:   ]
26:   init: fileStream [
27:     myStream := fileStream.
28:     self clearByte.
29:   ]
30:   flushByte [
31:     bitIndex = 8 ifFalse: [
32:       myStream nextPutByte: currentByte.
33:       self clearByte.
34:     ]
35:   ]
36:   writeBit: bit [
37:     currentByte := currentByte bitAt: bitIndex put: bit.
38:     bitIndex := bitIndex - 1.
39:     bitIndex = 0 ifTrue: [self flushByte].
40:   ]
41: ]
42:
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43:
44: " Output of bitstream hello world."
45: bitArray := #(
46:   1 0 1 0   1 0 1 1
47:   0 1 0 0   1 0 0 0
48:   0 1 1 0   0 1 0 1
49:   0 1 1 0   1 1 0 0
50:   0 1 1 0   1 1 0 0
51:   0 1 1 0   1 1 1 1
52:   0 0 1 0   1 1 0 0
53:   0 0 1 0   0 0 0 0
54:   0 1 0 1   0 1 1 1
55:   0 1 1 0   1 1 1 1
56:   0 1 1 1   0 0 1 0
57:   0 1 1 0   1 1 0 0
58:   0 1 1 0   0 1 0 0
59:   0 0 1 0   0 0 0 1
60:   1 0 1 1   1 0 1 1
61:   0 0 0 0   1 0 1 0
62:   0 0 1 1   0 0 1 0
63:   1 1 0 1   0 1 1 1
64:   0 0 1 1   0 0 1 0
65:   0 0 1 1   1 1 0 1
66:   0 0 1 1   0 1 0 0
67:   0 0 0 0   1 0 1 0
68: ) .
69:
```

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70:
71: writeBitArray := [:outfile|
72:   |outBytes|
73:   outBytes := OutBits new: outfile.
74:   bitArray do: [:bit| outBytes writeBit: bit].
75:   outBytes flushByte.
76: ].
77:
78: Smalltalk arguments size = 0
79:   ifTrue: [writeBitArray value: stdout]
80:   ifFalse: [
81:     |outfilename|
82:     outfile := Smalltalk arguments at: 1.
83:     [ |outfile|
84:       outfile := FileStream open: outfilemode mode: FileStream write.
85:       writeBitArray value: outfile.
86:       outfile close.
87:     ] on: SystemExceptions.FileError do: [:signal |
88:       |errno|
89:       errno := File errno.
90:       stdout flush.
91:       stderr << execname << ' : ' << filename << ' : '
92:         << signal messageText << nl.
93:       stderr flush.
94:     ]
95:   ]
96:
97: "TEST: outbits.st"
98: "TEST: outbits.st | od -c"
99: "TEST: outbits.st /tmp/outbits.tmp"
100: "TEST: cat -n /tmp/outbits.tmp"
101: "TEST: od -c /tmp/outbits.tmp"
102: "TEST: binarydump/binarydump /tmp/outbits.tmp"
103: "TEST: binarydump/hexadecimaldump /tmp/outbits.tmp"
104:
105:
```

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1: ::::::::::::::::::::::::::::
2: mkst: outbits.st
3: ::::::::::::::::::::::::::::
4: «Hello, World!»
5: 2×2=4
6: ::::::::::::::Exit status 0
7: ::::::::::::::::::::::::::::
8: mkst: outbits.st | od -c
9: ::::::::::::::::::::::::::::
10: 0000000 « H e l l o , W o r l d ! » \n
11: 0000020 2 × 2 = 4 \n
12: 0000026
13: ::::::::::::::Exit status 0
14: ::::::::::::::::::::::::::::
15: mkst: outbits.st /tmp/outbits.tmp
16: ::::::::::::::::::::::::::::
17: ::::::::::::::Exit status 0
18: ::::::::::::::::::::::::::::
19: mkst: cat -n /tmp/outbits.tmp
20: ::::::::::::::::::::::::::::
21: 1 «Hello, World!»
22: 2 2×2=4
23: ::::::::::::::Exit status 0
24: ::::::::::::::::::::::::::::
25: mkst: od -c /tmp/outbits.tmp
26: ::::::::::::::::::::::::::::
27: 0000000 « H e l l o , W o r l d ! » \n
28: 0000020 2 × 2 = 4 \n
29: 0000026
30: ::::::::::::::Exit status 0
31: ::::::::::::::::::::::::::::
32: mkst: binarydump/binarydump /tmp/outbits.tmp
33: ::::::::::::::::::::::::::::
34: /tmp/outbits.tmp:
35: 0 10101011 01001000 01100101 01101100
36: 253 AB 110 48 H 145 65 e 154 6C 1
37: 4 01101100 01101111 00101100 00100000
38: 154 6C 1 157 6F o 054 2C , 040 20
39: 8 01010111 01101111 01110010 01101100
40: 127 57 W 157 6F o 162 72 r 154 6C 1
41: 12 01100100 00100001 10111011 00001010
42: 144 64 d 041 21 ! 273 BB 012 0A
43: 16 00110010 11010111 00110010 00111101
44: 062 32 2 327 D7 062 32 2 075 3D =
45: 20 00110100 00001010
46: 064 34 4 012 0A
47: 22
48: ::::::::::::::Exit status 0
49: ::::::::::::::::::::::::::::
50: mkst: binarydump/hexadecimaldump /tmp/outbits.tmp
51: ::::::::::::::::::::::::::::
52: /tmp/outbits.tmp:
53: 0 AB48656C 6C6F2C20 576F726C 6421BB0A |.Hello, World!..|
54: 16 32D7323D 340A |2.2=4. |
55: ::::::::::::::Exit status 0
```