

```
1: // $Id: hello-world.cpp,v 1.26 2019-05-15 17:13:01-07 - - $
2:
3: #include <cmath>
4: #include <iostream>
5: #include <memory>
6: #include <string>
7: #include <vector>
8: using namespace std;
9:
10: #include <GL/freeglut.h>
11: #include <libgen.h>
12:
13: // Characteristics of the window.
14: struct window {
15:     string name;
16:     int width {384};
17:     int height {256};
18: } window;
19:
20: template <typename item_t>
21: struct cycle_iterator {
22:     const vector<item_t> items;
23:     size_t curr_item {0};
24:     cycle_iterator (initializer_list<item_t> list):
25:         items(vector<item_t> (list)) {}
26:     const item_t& operator*() { return items[curr_item]; }
27:     const item_t& operator[] (size_t index) {
28:         return items[(curr_item + index) % items.size()];
29:     }
30:     cycle_iterator& operator++() {
31:         curr_item = (curr_item + 1) % items.size();
32:         return *this;
33:     }
34: };
35:
36: cycle_iterator<string> greetings {
37:     "Hello, World!",
38:     "Hodie natus est radici frater.",
39:     "Goodbye, World!",
40: };
41:
42: GLubyte RED[] = {0xFF, 0x00, 0x00};
43: GLubyte GREEN[] = {0x00, 0xFF, 0x00};
44: GLubyte BLUE[] = {0x00, 0x00, 0xFF};
45: cycle_iterator<GLubyte*> colors {RED, GREEN, BLUE};
46:
47: cycle_iterator<void*> glut_fonts {
48:     GLUT_BITMAP_TIMES_ROMAN_24,
49:     GLUT_BITMAP_HELVETICA_18,
50:     GLUT_BITMAP_9_BY_15,
51: };
52:
```

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53:
54: void draw_rectangle (const GLubyte* color) {
55:     glBegin (GL_POLYGON);
56:     glColor3ubv (color);
57:     glVertex2f (0, 0);
58:     glVertex2f (window.width, 0);
59:     glVertex2f (window.width, window.height);
60:     glVertex2f (0, window.height);
61:     glEnd();
62: }
63:
64: void draw_ellipse (const GLubyte* color) {
65:     glBegin (GL_POLYGON);
66:     glColor3ubv (color);
67:     const GLfloat delta = 2 * M_PI / 64;
68:     const GLfloat width = window.width / 2.5;
69:     const GLfloat height = window.height / 2.5;
70:     const GLfloat xoffset = window.width / 2.0;
71:     const GLfloat yoffset = window.height / 2.0;
72:     for (GLfloat theta = 0; theta < 2 * M_PI; theta += delta) {
73:         GLfloat xpos = width * cos (theta) + xoffset;
74:         GLfloat ypos = height * sin (theta) + yoffset;
75:         glVertex2f (xpos, ypos);
76:     }
77:     glEnd();
78: }
79:
80: void draw_greeting (const string& greeting, const GLubyte* color) {
81:     const GLubyte* glgreeting =
82:         reinterpret_cast<const GLubyte*> (greeting.c_str());
83:
84:     void* font = *glut_fonts;
85:     int greeting_width = glutBitmapLength (font, glgreeting);
86:     int greeting_height = glutBitmapHeight (font);
87:
88:     glColor3ubv (color);
89:
90:     float xpos = window.width / 2.0 - greeting_width / 2.0;
91:     float ypos = window.height / 2.0 - greeting_height / 4.0;
92:     glRasterPos2f (xpos, ypos);
93:
94:     glutBitmapString (font, glgreeting);
95: }
96:
97: void display() {
98:     glClearColor (0.15, 0.15, 0.15, 1.0);
99:     glClear (GL_COLOR_BUFFER_BIT);
100:
101:     draw_rectangle (colors[0]);
102:     draw_ellipse (colors[1]);
103:     draw_greeting (*greetings, colors[2]);
104:
105:     glutSwapBuffers();
106: }
107:
```

```
108:
109: void invert_colors() {
110:     for (size_t color = 0; color < 3; ++color) {
111:         for (size_t rgb = 0; rgb < 3; ++rgb) {
112:             colors[color][rgb] ^= 0xFF;
113:         }
114:     }
115: }
116:
117: void keyboard (GLubyte key, int, int) {
118:     enum {BS = 8, LF = 10, CR = 13, ESC = 27, DEL = 127};
119:     switch (key) {
120:         case ' ': case BS: case CR: case LF: case DEL:
121:             invert_colors();
122:             break;
123:         case 'c': case 'C':
124:             ++colors;
125:             break;
126:         case 'f': case 'F':
127:             ++glut_fonts;
128:             break;
129:         case 'g': case 'G':
130:             ++greetings;
131:             break;
132:         case 'q': case 'Q': case ESC:
133:             exit (EXIT_SUCCESS);
134:     }
135:     glutPostRedisplay();
136: }
137:
138: void mouse (int button, int state, int, int) {
139:     if (state == GLUT_DOWN) {
140:         switch (button) {
141:             case GLUT_LEFT_BUTTON:
142:                 ++glut_fonts;
143:                 break;
144:             case GLUT_MIDDLE_BUTTON:
145:                 ++greetings;
146:                 break;
147:             case GLUT_RIGHT_BUTTON:
148:                 ++colors;
149:                 break;
150:         }
151:     }
152:     glutPostRedisplay();
153: }
154:
```

```
155:
156: void reshape (int width, int height) {
157:     window.width = width;
158:     window.height = height;
159:     glMatrixMode (GL_PROJECTION);
160:     glLoadIdentity();
161:     gluOrtho2D (0, window.width, 0, window.height);
162:     glMatrixMode (GL_MODELVIEW);
163:     glViewport (0, 0, window.width, window.height);
164:     glutPostRedisplay();
165: }
166:
167: void print_howto() {
168: cout << R"(
169: To cycle the colors: right mouse button or key 'c' or 'C'.
170: To cycle the fonts: left mouse button or key 'f' or 'F'.
171: To cycle the greetings: middle mouse button or key 'g' or 'G'.
172: To invert the colors: key Space, Backspace, Return, or Delete.
173: To quit: key 'q' or 'Q' or ESC.
174: )";
175: }
176:
177: int main (int argc, char** argv) {
178:     print_howto();
179:     window.name = basename (argv[0]);
180:     glutInit (&argc, argv);
181:     glutInitDisplayMode (GLUT_RGBA | GLUT_DOUBLE);
182:     glutInitWindowSize (window.width, window.height);
183:     glutCreateWindow (window.name.c_str());
184:     glutDisplayFunc (display);
185:     glutReshapeFunc (reshape);
186:     glutKeyboardFunc (keyboard);
187:     glutMouseFunc (mouse);
188:     glutMainLoop();
189:     return 0;
190: }
191:
192: //TEST// mkpspdf hello-world.cpp.ps hello-world.cpp*
193:
```

```
1: @@@@ mkc: starting hello-world.cpp
2: checksource hello-world.cpp
3: ident hello-world.cpp
4: hello-world.cpp:
5:      $Id: hello-world.cpp,v 1.26 2019-05-15 17:13:01-07 - - $
6: cpplint.py.perl hello-world.cpp
7: Done processing hello-world.cpp
8: g++ -g -O0 -Wall -Wextra -Wpedantic -Wshadow -fdiagnostics-color=never -
std=gnu++2a -Wold-style-cast hello-world.cpp -o hello-world -lm -lglut -lGL -lX11 -ldrm -lm
9: rm -f hello-world.o
10: @@@@ mkc: finished hello-world.cpp
```

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2: %Çì\217ç
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5: stream
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05/15/19
17:13:33

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hello-world.cpp.pdf

2/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

3/24

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9: endobj

10: 6 0 obj

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12: endobj

13: 15 0 obj

14: <</Length 16 0 R/Filter /FlateDecode>>

15: stream

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05/15/19
17:13:33

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hello-world.cpp.pdf

5/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

6/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

7/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

9/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

10/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

11/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

12/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

13/24

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30: endobj
31: 21 0 obj
32: 870
33: endobj
34: 25 0 obj
35: <</Length 26 0 R/Filter /FlateDecode>>
36: stream
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05/15/19
17:13:33

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hello-world.cpp.pdf

14/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

15/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

16/24

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05/15/19
17:13:33

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hello-world.cpp.pdf

18/24

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05/15/19
17:13:33

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19/24

"P\235\002T\224&¶vö]íç\236Û¹K\204fÊÄ\016cîMô\221}¶ë\030PW°1+|ð°\202/©HÖ\177
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\207%JÛ-\223îæië0\035\\222ëÛC\222\$wg\221Yg•ô4°</\206¶JÛ27î\202/¹â\225\216eUÃ
\227¬8çY^\035\017ð\222Ëxy1P7&bÛöæn\210\231NÆ\034\2141ÿË\205â÷t9\204îN\206\034¼
\024y>\031rôRdo*d\037¿\024Û\237


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ûx$AâdöÄ Bé; \222 îî)öÜ\034\202âx*aîb]~üt|x\037ÃÝ\223H?ÂLÖtÂÑŷnÖy
®Êû U«Ö\220\027'k=âhj=\202ÿÆó1¥\206Ã'k@âh\233\037- \223u \210\2161_è³?\027
\037k9\026\202Ê"çÿ%D.»<\036\002\017\017©\020¹l\212ääzö]§¤\223u\236h<Ê
50: \236\210.Ô\006iv'k=Ñèq²\203\036â\235¬î\020üLÖ¼\ 'îy»ÔÖñ\220\026tÊ\037nêD¤
Oîgg\220Wªûø.ðÛÊ\032
51: q\237ñ\211®\023ê\202÷ù2ä\225ù\001^)ëÖ\034Y\037}°î\033ÿK±ip#ûdÿ\013"\031}
¿endstream
52: endobj
53: 31 0 obj
54: 1024
55: endobj
56: 35 0 obj
57: <</Length 36 0 R/Filter /FlateDecode>>
58: stream
59: x\234Ã\227j\223\2336\024\206iö+îEgb•\005$>\005Wé&ÿØvw\2328\236æ"\233\231
h\2051ó\002"\222\210wûë+ÃPx2\230í&\027Øüê9G: :ø#\227\000îP\2073¬\220•J'«\021
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$ \216Ã!¼Ka\235£\005I2\022dADÿÿy\215^£0=B&öÖüØ»wnü\024|ÛI\235\020\020ê\206\224Z
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bBÃ\036'\036\206\001$ŷ\230Öµ^Åû\0020#\221\237A[çbsÔ"•\001Ëj.ÀHø°-[óJj³\022y;
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öÖâ²UZØP$ \204¬xwN©îÆ"\235\212Å53ª.»\226¹\030\013\003\235\215:ÆSÖW\222â\227¹\035
"0£Ö\227îÇM&Wp\237Êîmÿr\2049Ãó1ofÊä
60: Ê|ÔÃ\024ö_\205Ø7R\2311f\177>æðÛÖ¥0xÂ¾T±ç>1Dŷ\026\024\206³¹M'\223
¹5\227u1:QÑ|ÃÓiÛ\023¿\034|é\234öÃ?Rŷ:ø•E\235Êŷ\233âßQöüª\025\235îêÖ¼P\202\0311Ð
\217\221îw±è#¹}x.¿öü\034\003\237¬dñh\032|5<ß\234\001\217æ«[4\236\006ÿCÛßJ|ösäóÖ
ø\232L3ÖQ9mÆV\222²\031£\236®\7\013WÊ\234\031ö\003¾\213\030¾YN\017tQ\230\212\215
p7èç\022z%+Vûä\030Eø\004
61: úÖ\024¿\211ð\2230\005g\204\216ADÿ\037âöëC\221^Û\223hløcaâ²,\0057¶XªÊ îÔM
«°\201210»Ã\2006î¬úá\031":\026\006U\201³\201Ö\005"? \033\035÷âç\217¼ ú\207g'\035
+ôî\016ûÄrëöü? \207¬Ñ\177r\207æÄendstream
62: endobj
63: 36 0 obj
64: 832
65: endobj
66: 4 0 obj
67: <</Type/Page/MediaBox [0 0 612 792]
68: /Rotate 0/Parent 3 0 R
69: /Resources<</ProcSet[/PDF /Text]
70: /ExtGState 12 0 R
71: /Font 13 0 R
72: >>
73: /Contents 5 0 R
74: >>
75: endobj
76: 14 0 obj
77: <</Type/Page/MediaBox [0 0 612 792]
78: /Rotate 0/Parent 3 0 R
79: /Resources<</ProcSet[/PDF /Text]
80: /ExtGState 17 0 R
81: /Font 18 0 R
82: >>
83: /Contents 15 0 R
84: >>
```

```
85: endobj
86: 19 0 obj
87: <</Type/Page/MediaBox [0 0 612 792]
88: /Rotate 0/Parent 3 0 R
89: /Resources<</ProcSet[/PDF /Text]
90: /ExtGState 22 0 R
91: /Font 23 0 R
92: >>
93: /Contents 20 0 R
94: >>
95: endobj
96: 24 0 obj
97: <</Type/Page/MediaBox [0 0 612 792]
98: /Rotate 0/Parent 3 0 R
99: /Resources<</ProcSet[/PDF /Text]
100: /ExtGState 27 0 R
101: /Font 28 0 R
102: >>
103: /Contents 25 0 R
104: >>
105: endobj
106: 29 0 obj
107: <</Type/Page/MediaBox [0 0 612 792]
108: /Rotate 0/Parent 3 0 R
109: /Resources<</ProcSet[/PDF /Text]
110: /ExtGState 32 0 R
111: /Font 33 0 R
112: >>
113: /Contents 30 0 R
114: >>
115: endobj
116: 34 0 obj
117: <</Type/Page/MediaBox [0 0 612 792]
118: /Rotate 0/Parent 3 0 R
119: /Resources<</ProcSet[/PDF /Text]
120: /ExtGState 37 0 R
121: /Font 38 0 R
122: >>
123: /Contents 35 0 R
124: >>
125: endobj
126: 3 0 obj
127: << /Type /Pages /Kids [
128: 4 0 R
129: 14 0 R
130: 19 0 R
131: 24 0 R
132: 29 0 R
133: 34 0 R
134: ] /Count 6
135: >>
136: endobj
137: 1 0 obj
138: <</Type /Catalog /Pages 3 0 R
139: /Metadata 39 0 R
140: >>
141: endobj
142: 7 0 obj
```

```
143: <</Type/ExtGState
144: /OPM 1>>endobj
145: 12 0 obj
146: <</R7
147: 7 0 R>>
148: endobj
149: 13 0 obj
150: <</R8
151: 8 0 R/R10
152: 10 0 R/R9
153: 9 0 R/R11
154: 11 0 R>>
155: endobj
156: 17 0 obj
157: <</R7
158: 7 0 R>>
159: endobj
160: 18 0 obj
161: <</R8
162: 8 0 R/R10
163: 10 0 R/R9
164: 9 0 R/R11
165: 11 0 R>>
166: endobj
167: 22 0 obj
168: <</R7
169: 7 0 R>>
170: endobj
171: 23 0 obj
172: <</R8
173: 8 0 R/R10
174: 10 0 R/R9
175: 9 0 R/R11
176: 11 0 R>>
177: endobj
178: 27 0 obj
179: <</R7
180: 7 0 R>>
181: endobj
182: 28 0 obj
183: <</R8
184: 8 0 R/R10
185: 10 0 R/R9
186: 9 0 R/R11
187: 11 0 R>>
188: endobj
189: 32 0 obj
190: <</R7
191: 7 0 R>>
192: endobj
193: 33 0 obj
194: <</R8
195: 8 0 R/R10
196: 10 0 R/R9
197: 9 0 R/R11
198: 11 0 R>>
199: endobj
200: 37 0 obj
```

```
201: <</R7
202: 7 0 R>>
203: endobj
204: 38 0 obj
205: <</R8
206: 8 0 R/R10
207: 10 0 R/R9
208: 9 0 R/R11
209: 11 0 R>>
210: endobj
211: 8 0 obj
212: <</BaseFont/Times-Bold/Type/Font
213: /Subtype/Type1>>
214: endobj
215: 10 0 obj
216: <</BaseFont/Times-Roman/Type/Font
217: /Subtype/Type1>>
218: endobj
219: 9 0 obj
220: <</BaseFont/Helvetica-Bold/Type/Font
221: /Subtype/Type1>>
222: endobj
223: 11 0 obj
224: <</BaseFont/Courier-Bold/Type/Font
225: /Subtype/Type1>>
226: endobj
227: 39 0 obj
228: <</Type/Metadata
229: /Subtype/XML/Length 1430>>stream
230: <?xpacket begin='ï»¿' id='W5M0MpCehiHzreSzNTczkc9d'??>
231: <?adobe-xap-filters esc="CRLF"??>
232: <x:xmpmeta xmlns:x='adobe:ns:meta/' x:xmptk='XMP toolkit 2.9.1-13, frame
work 1.6'>
233: <rdf:RDF xmlns:rdf='http://www.w3.org/1999/02/22-rdf-syntax-ns#' xmlns:i
X='http://ns.adobe.com/iX/1.0/'>
234: <rdf:Description rdf:about='uuid:fd9d2e88-af8b-11f4-0000-be943387ce8c' x
mlns:pdf='http://ns.adobe.com/pdf/1.3/' pdf:Producer='GPL Ghostscript 9.07'>
235: <rdf:Description rdf:about='uuid:fd9d2e88-af8b-11f4-0000-be943387ce8c' x
mlns:xmp='http://ns.adobe.com/xap/1.0/'><xmp:ModifyDate>2019-05-15T17:13:33-07:
00</xmp:ModifyDate>
236: <xmp:CreateDate>2019-05-15T17:13:33-07:00</xmp:CreateDate>
237: <xmp:CreatorTool>GNU Enscript 1.6.6</xmp:CreatorTool></rdf:Description>
238: <rdf:Description rdf:about='uuid:fd9d2e88-af8b-11f4-0000-be943387ce8c' x
mlns:xapMM='http://ns.adobe.com/xap/1.0/mm/' xapMM:DocumentID='uuid:fd9d2e88-af
8b-11f4-0000-be943387ce8c'>
239: <rdf:Description rdf:about='uuid:fd9d2e88-af8b-11f4-0000-be943387ce8c' x
mlns:dc='http://purl.org/dc/elements/1.1/' dc:format='application/pdf'><dc:titl
e><rdf:Alt><rdf:li xml:lang='x-default'>./hello-world.cpp.ps</rdf:li></rdf:Alt>
</dc:title><dc:creator><rdf:Seq><rdf:li>Wesley Mackey</rdf:li></rdf:Seq></dc:cr
eator></rdf:Description>
240: </rdf:RDF>
241: </x:xmpmeta>
242:
243:
244: <?xpacket end='w'??>
245: endstream
246: endobj
247: 2 0 obj
```

```
248: <</Producer(GPL Ghostscript 9.07)
249: /CreationDate(D:20190515171333-07'00')
250: /ModDate(D:20190515171333-07'00')
251: /Title(/hello-world.cpp.ps)
252: /Author(Wesley Mackey)
253: /Creator(GNU Enscript 1.6.6)>>endobj
254: xref
255: 0 40
256: 0000000000 65535 f
257: 0000007406 00000 n
258: 0000009834 00000 n
259: 0000007312 00000 n
260: 0000006342 00000 n
261: 0000000015 00000 n
262: 0000001146 00000 n
263: 0000007471 00000 n
264: 0000008058 00000 n
265: 0000008190 00000 n
266: 0000008123 00000 n
267: 0000008259 00000 n
268: 0000007512 00000 n
269: 0000007542 00000 n
270: 0000006502 00000 n
271: 0000001166 00000 n
272: 0000002271 00000 n
273: 0000007603 00000 n
274: 0000007633 00000 n
275: 0000006664 00000 n
276: 0000002292 00000 n
277: 0000003234 00000 n
278: 0000007694 00000 n
279: 0000007724 00000 n
280: 0000006826 00000 n
281: 0000003254 00000 n
282: 0000004281 00000 n
283: 0000007785 00000 n
284: 0000007815 00000 n
285: 0000006988 00000 n
286: 0000004301 00000 n
287: 0000005397 00000 n
288: 0000007876 00000 n
289: 0000007906 00000 n
290: 0000007150 00000 n
291: 0000005418 00000 n
292: 0000006322 00000 n
293: 0000007967 00000 n
294: 0000007997 00000 n
295: 0000008327 00000 n
296: trailer
297: << /Size 40 /Root 1 0 R /Info 2 0 R
298: /ID [<05D7B8EBA667F206B442BCE2A751FE02><05D7B8EBA667F206B442BCE2A751FE02
>]
299: >>
300: startxref
301: 10038
302: %%EOF
```

```
1: %!PS-Adobe-3.0
2: %%BoundingBox: 38 24 574 768
3: %%Title: Enscript Output
4: %%For: Wesley Mackey
5: %%Creator: GNU Enscript 1.6.6
6: %%CreationDate: Wed May 15 17:16:23 2019
7: %%Orientation: Portrait
8: %%Pages: (attend)
9: %%DocumentMedia: Letter 612 792 0 ( ) ( )
10: %%DocumentNeededResources: (attend)
11: %%EndComments
12: %%BeginProlog
13: %%BeginResource: procset Enscript-Prolog 1.6 6
14: %
15: % Procedures.
16: %
17:
18: /_S {      % save current state
19:   /_s save def
20: } def
21: /_R {      % restore from saved state
22:   _s restore
23: } def
24:
25: /S {      % showpage protecting gstate
26:   gsave
27:   showpage
28:   grestore
29: } bind def
30:
31: /MF {      % fontname newfontname -> -      make a new encoded font
32:   /newfontname exch def
33:   /fontname exch def
34:
35:   /fontdict fontname findfont def
36:   /newfont fontdict maxlength dict def
37:
38:   fontdict {
39:     exch
40:     dup /FID eq {
41:       % skip FID pair
42:       pop pop
43:     } {
44:       % copy to the new font dictionary
45:       exch newfont 3 1 roll put
46:     } ifelse
47:   } forall
48:
49:   newfont /FontName newfontname put
50:
51:   % insert only valid encoding vectors
52:   encoding_vector length 256 eq {
53:     newfont /Encoding encoding_vector put
54:   } if
55:
56:   newfontname newfont definefont pop
57: } def
58:
```

```
59: /MF_PS { % fontname newfontname -> -      make a new font preserving its e
nc
60:   /newfontname exch def
61:   /fontname exch def
62:
63:   /fontdict fontname findfont def
64:   /newfont fontdict maxlength dict def
65:
66:   fontdict {
67:     exch
68:     dup /FID eq {
69:       % skip FID pair
70:       pop pop
71:     } {
72:       % copy to the new font dictionary
73:       exch newfont 3 1 roll put
74:     } ifelse
75:   } forall
76:
77:   newfont /FontName newfontname put
78:
79:   newfontname newfont definefont pop
80: } def
81:
82: /SF { % fontname width height -> -      set a new font
83:   /height exch def
84:   /width exch def
85:
86:   findfont
87:   [width 0 0 height 0 0] makefont setfont
88: } def
89:
90: /SUF { % fontname width height -> -      set a new user font
91:   /height exch def
92:   /width exch def
93:
94:   /F-gs-user-font MF
95:   /F-gs-user-font width height SF
96: } def
97:
98: /SUF_PS { % fontname width height -> -  set a new user font preserving i
ts enc
99:   /height exch def
100:  /width exch def
101:
102:  /F-gs-user-font MF_PS
103:  /F-gs-user-font width height SF
104: } def
105:
106: /M {moveto} bind def
107: /s {show} bind def
108:
109: /Box { % x y w h -> -      define box path
110:   /d_h exch def /d_w exch def /d_y exch def /d_x exch def
111:   d_x d_y moveto
112:   d_w 0 rlineto
113:   0 d_h rlineto
114:   d_w neg 0 rlineto
```

```
115:   closepath
116: } def
117:
118: /bgs { % x y height blskip gray str -> -      show string with bg colo
r
119:   /str exch def
120:   /gray exch def
121:   /blskip exch def
122:   /height exch def
123:   /y exch def
124:   /x exch def
125:
126:   gsave
127:     x y blskip sub str stringwidth pop height Box
128:     gray setgray
129:     fill
130:   grestore
131:   x y M str s
132: } def
133:
134: /bgcs { % x y height blskip red green blue str -> -  show string with bg
color
135:   /str exch def
136:   /blue exch def
137:   /green exch def
138:   /red exch def
139:   /blskip exch def
140:   /height exch def
141:   /y exch def
142:   /x exch def
143:
144:   gsave
145:     x y blskip sub str stringwidth pop height Box
146:     red green blue setrgbcolor
147:     fill
148:   grestore
149:   x y M str s
150: } def
151:
152: % Highlight bars.
153: /highlight_bars { % nlines lineheight output_y_margin gray -> -
154:   gsave
155:     setgray
156:     /ymarg exch def
157:     /lineheight exch def
158:     /nlines exch def
159:
160:     % This 2 is just a magic number to sync highlight lines to text.
161:     0 d_header_y ymarg sub 2 sub translate
162:
163:     /cw d_output_w cols div def
164:     /nrows d_output_h ymarg 2 mul sub lineheight div cvi def
165:
166:     % for each column
167:     0 1 cols 1 sub {
168:       cw mul /xp exch def
169:
170:       % for each rows
```



```
171:      0 1 nrows 1 sub {
172:        /rn exch def
173:        rn lineheight mul neg /yp exch def
174:        rn nlines idiv 2 mod 0 eq {
175:          % Draw highlight bar. 4 is just a magic indentation.
176:          xp 4 add yp cw 8 sub lineheight neg Box fill
177:        } if
178:      } for
179:    } for
180:
181:    grestore
182:  } def
183:
184: % Line highlight bar.
185: /line_highlight {      % x y width height gray -> -
186:   gsave
187:   /gray exch def
188:   Box gray setgray fill
189:   grestore
190: } def
191:
192: % Column separator lines.
193: /column_lines {
194:   gsave
195:   .1 setlinewidth
196:   0 d_footer_h translate
197:   /cw d_output_w cols div def
198:   1 1 cols 1 sub {
199:     cw mul 0 moveto
200:     0 d_output_h rlineto stroke
201:   } for
202:   grestore
203: } def
204:
205: % Column borders.
206: /column_borders {
207:   gsave
208:   .1 setlinewidth
209:   0 d_footer_h moveto
210:   0 d_output_h rlineto
211:   d_output_w 0 rlineto
212:   0 d_output_h neg rlineto
213:   closepath stroke
214:   grestore
215: } def
216:
217: % Do the actual underlay drawing
218: /draw_underlay {
219:   ul_style 0 eq {
220:     ul_str true charpath stroke
221:   } {
222:     ul_str show
223:   } ifelse
224: } def
225:
226: % Underlay
227: /underlay {      % - -> -
228:   gsave
```

```
229:    0 d_page_h translate
230:    d_page_h neg d_page_w atan rotate
231:
232:    ul_gray setgray
233:    ul_font setfont
234:    /dw d_page_h dup mul d_page_w dup mul add sqrt def
235:    ul_str stringwidth pop dw exch sub 2 div ul_h_ptsize -2 div moveto
236:    draw_underlay
237:    grestore
238: } def
239:
240: /user_underlay {          % - -> -
241:     gsave
242:     ul_x ul_y translate
243:     ul_angle rotate
244:     ul_gray setgray
245:     ul_font setfont
246:     0 0 ul_h_ptsize 2 div sub moveto
247:     draw_underlay
248:     grestore
249: } def
250:
251: % Page prefeed
252: /page_prefeed {          % bool -> -
253:     statusdict /prefeed known {
254:         statusdict exch /prefeed exch put
255:     } {
256:         pop
257:     } ifelse
258: } def
259:
260: % Wrapped line markers
261: /wrapped_line_mark {     % x y charwidth charheight type -> -
262:     /type exch def
263:     /h exch def
264:     /w exch def
265:     /y exch def
266:     /x exch def
267:
268:     type 2 eq {
269:         % Black boxes (like TeX does)
270:         gsave
271:         0 setlinewidth
272:         x w 4 div add y h 2 div add M
273:         0 h rlineto w 2 div 0 rlineto 0 h neg rlineto
274:         closepath fill
275:         grestore
276:     } {
277:         type 3 eq {
278:             % Small arrows
279:             gsave
280:             .2 setlinewidth
281:             x w 2 div add y h 2 div add M
282:             w 4 div 0 rlineto
283:             x w 4 div add y lineto stroke
284:
285:             x w 4 div add w 8 div add y h 4 div add M
286:             x w 4 div add y lineto
```

```
287:      w 4 div h 8 div rlineto stroke
288:      grestore
289:    } {
290:      % do nothing
291:    } ifelse
292:  } ifelse
293: } def
294:
295: % EPSF import.
296:
297: /BeginEPSF {
298:   /b4_Inc_state save def           % Save state for cleanup
299:   /dict_count countdictstack def   % Count objects on dict stack
300:   /op_count count 1 sub def        % Count objects on operand stack
301:   userdict begin
302:   /showpage { } def
303:   0 setgray 0 setlinecap
304:   1 setlinewidth 0 setlinejoin
305:   10 setmiterlimit [ ] 0 setdash newpath
306:   /languagelevel where {
307:     pop languagelevel
308:     1 ne {
309:       false setstrokeadjust false setoverprint
310:     } if
311:   } if
312: } bind def
313:
314: /EndEPSF {
315:   count op_count sub { pos } repeat % Clean up stacks
316:   countdictstack dict_count sub { end } repeat
317:   b4_Inc_state restore
318: } bind def
319:
320: % Check PostScript language level.
321: /languagelevel where {
322:   pop /gs_languagelevel languagelevel def
323: } {
324:   /gs_languagelevel 1 def
325: } ifelse
326: %%EndResource
327: %%BeginResource: procset Enscript-Encoding-88591 1.6 6
328: /encoding_vector [
329:   /.notdef      /.notdef      /.notdef      /.notdef
330:   /.notdef      /.notdef      /.notdef      /.notdef
331:   /.notdef      /.notdef      /.notdef      /.notdef
332:   /.notdef      /.notdef      /.notdef      /.notdef
333:   /.notdef      /.notdef      /.notdef      /.notdef
334:   /.notdef      /.notdef      /.notdef      /.notdef
335:   /.notdef      /.notdef      /.notdef      /.notdef
336:   /.notdef      /.notdef      /.notdef      /.notdef
337:   /space        /exclam      /quotedbl     /numbersign
338:   /dollar       /percent      /ampersand    /quoteright
339:   /parenleft    /parenright  /asterisk     /plus
340:   /comma        /hyphen     /period       /slash
341:   /zero         /one        /two         /three
342:   /four         /five       /six         /seven
343:   /eight        /nine       /colon       /semicolon
344:   /less         /equal      /greater     /question
```

```

345: /at /A /B /C
346: /D /E /F /G
347: /H /I /J /K
348: /L /M /N /O
349: /P /Q /R /S
350: /T /U /V /W
351: /X /Y /Z /bracketleft
352: /backslash /bracketright /asciicircum /underscore
353: /quoteleft /a /b /c
354: /d /e /f /g
355: /h /i /j /k
356: /l /m /n /o
357: /p /q /r /s
358: /t /u /v /w
359: /x /y /z /braceleft
360: /bar /braceright /tilde /.notdef
361: /.notdef /.notdef /.notdef /.notdef
362: /.notdef /.notdef /.notdef /.notdef
363: /.notdef /.notdef /.notdef /.notdef
364: /.notdef /.notdef /.notdef /.notdef
365: /.notdef /.notdef /.notdef /.notdef
366: /.notdef /.notdef /.notdef /.notdef
367: /.notdef /.notdef /.notdef /.notdef
368: /.notdef /.notdef /.notdef /.notdef
369: /space /exclamdown /cent /sterling
370: /currency /yen /brokenbar /section
371: /dieresis /copyright /ordfeminine /guillemotleft
372: /logicalnot /hyphen /registered /macron
373: /degree /plusminus /twosuperior /threesuperior
374: /acute /mu /paragraph /bullet
375: /cedilla /onesuperior /ordmasculine /guillemotright
376: /onequarter /onehalf /threequarters /questiondown
377: /Agrave /Aacute /Acircumflex /Atilde
378: /Adieresis /Aring /AE /Ccedilla
379: /Egrave /Eacute /Ecircumflex /Edieresis
380: /Igrave /Iacute /Icircumflex /Idieresis
381: /Eth /Ntilde /Ograve /Oacute
382: /Ocircumflex /Otilde /Odieresis /multiply
383: /Oslash /Ugrave /Uacute /Ucircumflex
384: /Udieresis /Yacute /Thorn /germandbls
385: /agrave /aacute /acircumflex /atilde
386: /adieresis /aring /ae /ccedilla
387: /egrave /eacute /ecircumflex /edieresis
388: /igrave /iacute /icircumflex /idieresis
389: /eth /ntilde /ograde /oacute
390: /ocircumflex /otilde /odieresis /divide
391: /oslash /ugrave /uacute /ucircumflex
392: /udieresis /yacute /thorn /ydieresis
393: ] def
394: %%EndResource
395: %%EndProlog
396: %%BeginSetup
397: %%IncludeResource: font Courier-Bold
398: /HFpt_w 10 def
399: /HFpt_h 10 def
400: /Courier-Bold /HF-gs-font MF
401: /HF /HF-gs-font findfont [HFpt_w 0 0 HFpt_h 0 0] makefont def
402: /Courier-Bold /F-gs-font MF

```

```
403: /F-gs-font 11 11 SF
404: /#copies 1 def
405: % Pagedevice definitions:
406: gs_languagelevel 1 gt {
407:   <<
408:     /PageSize [612 792]
409:   >> setpagedevice
410: } if
411: %%BeginResource: procset Enscript-Header-enscript-mycolor 1.6 6
412: %%IncludeResource: font Times-Bold
413: %%IncludeResource: font Times-Roman
414:
415: % Fonts.
416: /Times-Bold /HeaderFont-Bold MF
417: /HeaderDateF /HeaderFont-Bold findfont 12 scalefont def
418:
419: /Times-Roman /HeaderFont-Times MF
420: /HeaderHDRF /HeaderFont-Times findfont 14 scalefont def
421:
422: /HeaderPageNumF /Helvetica-Bold findfont 28.8 scalefont def
423: /HeaderPageCountF /Helvetica-Bold findfont 18 scalefont def
424:
425: /do_header {      % print enscript header
426:   gsave
427:     d_header_x d_header_y translate
428:
429:     /dhw d_header_w 4 sub def
430:
431:     /linecolor {0 0 0 setrgbcolor} bind def % line color
432:     /txcolor   {0 0 0 setrgbcolor} bind def % text color
433:     /fncolor   {0 0 0 setrgbcolor} bind def % filename line color
434:
435:     .5 setlinewidth
436:
437:     % line across bottom of the header area
438:     linecolor
439:     0 0 moveto dhw 0 lineto
440:
441:     % side boxes
442:     /sbw d_header_h 2 mul def      % side box width
443:
444:     % left side box
445:     0 0 sbw d_header_h Box
446:     linecolor
447:     stroke
448:
449:     % date/time in left box
450:     txcolor
451:     HeaderDateF setfont
452:     moddatestr dup stringwidth pop sbw exch sub 2 div
453:     d_header_h 2 div 2 add moveto show
454:     modtimestr dup stringwidth pop sbw exch sub 2 div
455:     d_header_h 5 div moveto show
456:
457:     % right side box
458:     dhw sbw sub 0 sbw d_header_h Box
459:     linecolor
460:     stroke
```

```
461:
462:    % get width of pagecount
463:    HeaderPageCountF setfont
464:    pagecountstr stringwidth pop
465:
466:    txcolor
467:    HeaderPageNumF setfont
468:    pagenumstr stringwidth pop add    % add to width of pagecount
469:    sbw exch sub 2 div dhw sbw sub add
470:    d_header_h .2 mul moveto
471:
472:    pagenumstr show
473:
474:    HeaderPageCountF setfont
475:    pagecountstr show
476:
477:    % filename
478:    fncolor
479:    HeaderHDRF setfont
480:    dhw fname stringwidth pop sub 2 div d_header_h 8 div moveto
481:    fname show
482:
483:    % user supplied header string.
484:    user_header_p {
485:        /h d_header_h 8 div 5 mul def
486:
487:        % HACK around a bug in enscript 1.6.0:
488:        % for some reason this is getting set to "(null)" and
489:        %
490:        user_header_center_str (\(null\)) eq {
491:            /user_header_center_str () def
492:        } if
493:
494:        % Implement strict enscript compatibility.
495:        user_header_center_str () eq user_header_right_str () eq and {
496:            dhw user_header_left_str stringwidth pop sub 2 div
497:            h moveto user_header_left_str show
498:        } {
499:            sbw 5 add h moveto user_header_left_str show
500:
501:            dhw user_header_center_str stringwidth pop sub 2 div
502:            h moveto user_header_center_str show
503:
504:            dhw sbw sub 5 sub user_header_right_str stringwidth pop
505:            sub h moveto user_header_right_str show
506:        } ifelse
507:    } if
508:
509:    grestore
510: } bind def
511: %%EndResource
512: /d_page_w 536 def
513: /d_page_h 744 def
514: /d_header_x 0 def
515: /d_header_y 708 def
516: /d_header_w 536 def
517: /d_header_h 36 def
518: /d_footer_x 0 def
```

```
519: /d_footer_y 0 def
520: /d_footer_w 536 def
521: /d_footer_h 0 def
522: /d_output_w 536 def
523: /d_output_h 708 def
524: /cols 1 def
525: %%EndSetup
526: %%Page: (1) 1
527: %%BeginPageSetup
528: _s
529: 38 24 translate
530: /pagenum 1 def
531: /fname (hello-world.cpp) def
532: /fdire (.) def
533: /ftail (hello-world.cpp) def
534: % User defined strings:
535: /pagenumstr (1) def
536: /moddatestr (05/15/19) def
537: /pagecountstr (/4) def
538: /modtimestr (17:16:15) def
539: /user_header_p true def
540: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
541: /user_header_center_str () def
542: /user_header_right_str () def
543: /user_footer_p false def
544: %%EndPageSetup
545: column_borders
546: do_header
547: 32.4 694 M (1:) s
548: 52.2 694 M
549: (// $Id: hello-world.cpp,v 1.26 2019-05-15 17:13:01-07 - - $) s
550: 32.4 682 M (2:) s
551: 32.4 670 M (3:) s
552: 52.2 670 M
553: (#include <cmath>) s
554: 32.4 658 M (4:) s
555: 52.2 658 M
556: (#include <iostream>) s
557: 32.4 646 M (5:) s
558: 52.2 646 M
559: (#include <memory>) s
560: 32.4 634 M (6:) s
561: 52.2 634 M
562: (#include <string>) s
563: 32.4 622 M (7:) s
564: 52.2 622 M
565: (#include <vector>) s
566: 32.4 610 M (8:) s
567: 52.2 610 M
568: (using namespace std;) s
569: 32.4 598 M (9:) s
570: 25.8 586 M (10:) s
571: 52.2 586 M
572: (#include <GL/freeglut.h>) s
573: 25.8 574 M (11:) s
574: 52.2 574 M
575: (#include <libgen.h>) s
```

```
576: 25.8 562 M (12:) s
577: 25.8 550 M (13:) s
578: 52.2 550 M
579: (// Characteristics of the window.) s
580: 25.8 538 M (14:) s
581: 52.2 538 M
582: (struct window {) s
583: 25.8 526 M (15:) s
584: 52.2 526 M
585: (    string name;) s
586: 25.8 514 M (16:) s
587: 52.2 514 M
588: (    int width {384};) s
589: 25.8 502 M (17:) s
590: 52.2 502 M
591: (    int height {256};) s
592: 25.8 490 M (18:) s
593: 52.2 490 M
594: (} window;) s
595: 25.8 478 M (19:) s
596: 25.8 466 M (20:) s
597: 52.2 466 M
598: (template <typename item_t>) s
599: 25.8 454 M (21:) s
600: 52.2 454 M
601: (struct cycle_iterator {) s
602: 25.8 442 M (22:) s
603: 52.2 442 M
604: (    const vector<item_t> items;) s
605: 25.8 430 M (23:) s
606: 52.2 430 M
607: (    size_t curr_item {0};) s
608: 25.8 418 M (24:) s
609: 52.2 418 M
610: (    cycle_iterator \(\initializer_list<item_t> list\):) s
611: 25.8 406 M (25:) s
612: 52.2 406 M
613: (                items\(\vector<item_t> \(\list\)\) {}}) s
614: 25.8 394 M (26:) s
615: 52.2 394 M
616: (    const item_t& operator*\(\) { return items[curr_item]; }) s
617: 25.8 382 M (27:) s
618: 52.2 382 M
619: (    const item_t& operator[] \(\size_t index\) {) s
620: 25.8 370 M (28:) s
621: 52.2 370 M
622: (        return items[\(\curr_item + index\) % items.size\(\)\];) s
623: 25.8 358 M (29:) s
624: 52.2 358 M
625: (    }) s
626: 25.8 346 M (30:) s
627: 52.2 346 M
628: (    cycle_iterator& operator++\(\) { ) s
629: 25.8 334 M (31:) s
630: 52.2 334 M
631: (        curr_item = \(\curr_item + 1\) % items.size\(\)\);) s
632: 25.8 322 M (32:) s
633: 52.2 322 M
```



```
634: (    return *this;) s
635: 25.8 310 M (33:) s
636: 52.2 310 M
637: (    }) s
638: 25.8 298 M (34:) s
639: 52.2 298 M
640: (};) s
641: 25.8 286 M (35:) s
642: 25.8 274 M (36:) s
643: 52.2 274 M
644: (cycle_iterator<string> greetings {}) s
645: 25.8 262 M (37:) s
646: 52.2 262 M
647: (    "Hello, World!",) s
648: 25.8 250 M (38:) s
649: 52.2 250 M
650: (    "Hodie natus est radici frater.",) s
651: 25.8 238 M (39:) s
652: 52.2 238 M
653: (    "Goodbye, World!",) s
654: 25.8 226 M (40:) s
655: 52.2 226 M
656: (};) s
657: 25.8 214 M (41:) s
658: 25.8 202 M (42:) s
659: 52.2 202 M
660: (GLubyte RED[] = {0xFF, 0x00, 0x00};) s
661: 25.8 190 M (43:) s
662: 52.2 190 M
663: (GLubyte GREEN[] = {0x00, 0xFF, 0x00};) s
664: 25.8 178 M (44:) s
665: 52.2 178 M
666: (GLubyte BLUE[] = {0x00, 0x00, 0xFF};) s
667: 25.8 166 M (45:) s
668: 52.2 166 M
669: (cycle_iterator<GLubyte*> colors {RED, GREEN, BLUE};) s
670: 25.8 154 M (46:) s
671: 25.8 142 M (47:) s
672: 52.2 142 M
673: (cycle_iterator<void*> glut_fonts {}) s
674: 25.8 130 M (48:) s
675: 52.2 130 M
676: (    GLUT_BITMAP_TIMES_ROMAN_24,) s
677: 25.8 118 M (49:) s
678: 52.2 118 M
679: (    GLUT_BITMAP_HELVETICA_18,) s
680: 25.8 106 M (50:) s
681: 52.2 106 M
682: (    GLUT_BITMAP_9_BY_15,) s
683: 25.8 94 M (51:) s
684: 52.2 94 M
685: (};) s
686: 25.8 82 M (52:) s
687: _R
688: S
689: %%Page: (2) 2
690: %%BeginPageSetup
691: _S
```

```
692: 38 24 translate
693: /pagenum 2 def
694: /fname (hello-world.cpp) def
695: /fdir (.) def
696: /ftail (hello-world.cpp) def
697: % User defined strings:
698: /pagenumstr (2) def
699: /moddatestr (05/15/19) def
700: /pagecountstr (/4) def
701: /modtimestr (17:16:15) def
702: /user_header_p true def
703: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
704: /user_header_center_str () def
705: /user_header_right_str () def
706: /user_footer_p false def
707: %%EndPageSetup
708: column_borders
709: do_header
710: 25.8 694 M (53:) s
711: 25.8 682 M (54:) s
712: 52.2 682 M
713: (void draw_rectangle \((const GLubyte* color\) {) s
714: 25.8 670 M (55:) s
715: 52.2 670 M
716: ( glBegin \((GL_POLYGON\);) s
717: 25.8 658 M (56:) s
718: 52.2 658 M
719: ( glColor3ubv \((color\);) s
720: 25.8 646 M (57:) s
721: 52.2 646 M
722: ( glVertex2f \((0, 0\);) s
723: 25.8 634 M (58:) s
724: 52.2 634 M
725: ( glVertex2f \((window.width, 0\);) s
726: 25.8 622 M (59:) s
727: 52.2 622 M
728: ( glVertex2f \((window.width, window.height\);) s
729: 25.8 610 M (60:) s
730: 52.2 610 M
731: ( glVertex2f \((0, window.height\);) s
732: 25.8 598 M (61:) s
733: 52.2 598 M
734: ( glEnd\(\);) s
735: 25.8 586 M (62:) s
736: 52.2 586 M
737: (}) s
738: 25.8 574 M (63:) s
739: 25.8 562 M (64:) s
740: 52.2 562 M
741: (void draw_ellipse \((const GLubyte* color\) {) s
742: 25.8 550 M (65:) s
743: 52.2 550 M
744: ( glBegin \((GL_POLYGON\);) s
745: 25.8 538 M (66:) s
746: 52.2 538 M
747: ( glColor3ubv \((color\);) s
748: 25.8 526 M (67:) s
```

```
749: 52.2 526 M
750: (   const GLfloat delta = 2 * M_PI / 64;) s
751: 25.8 514 M (68:) s
752: 52.2 514 M
753: (   const GLfloat width = window.width / 2.5;) s
754: 25.8 502 M (69:) s
755: 52.2 502 M
756: (   const GLfloat height = window.height / 2.5;) s
757: 25.8 490 M (70:) s
758: 52.2 490 M
759: (   const GLfloat xoffset = window.width / 2.0;) s
760: 25.8 478 M (71:) s
761: 52.2 478 M
762: (   const GLfloat yoffset = window.height / 2.0;) s
763: 25.8 466 M (72:) s
764: 52.2 466 M
765: (   for \(\GLfloat theta = 0; theta < 2 * M_PI; theta += delta\) {) s
766: 25.8 454 M (73:) s
767: 52.2 454 M
768: (       GLfloat xpos = width * cos \(\theta\) + xoffset;) s
769: 25.8 442 M (74:) s
770: 52.2 442 M
771: (       GLfloat ypos = height * sin \(\theta\) + yoffset;) s
772: 25.8 430 M (75:) s
773: 52.2 430 M
774: (       glVertex2f \(\xpos, ypos\);) s
775: 25.8 418 M (76:) s
776: 52.2 418 M
777: (   }) s
778: 25.8 406 M (77:) s
779: 52.2 406 M
780: (   glEnd\(\);) s
781: 25.8 394 M (78:) s
782: 52.2 394 M
783: (}) s
784: 25.8 382 M (79:) s
785: 25.8 370 M (80:) s
786: 52.2 370 M
787: (void draw_greeting \(\const string& greeting, const GLubyte* color\) {)
s
788: 25.8 358 M (81:) s
789: 52.2 358 M
790: (   const GLubyte* glgreeting =) s
791: 25.8 346 M (82:) s
792: 52.2 346 M
793: (       reinterpret_cast<const GLubyte*> \(\greeting.c_str\(\)\);) s
794: 25.8 334 M (83:) s
795: 25.8 322 M (84:) s
796: 52.2 322 M
797: (   void* font = *glut_fonts;) s
798: 25.8 310 M (85:) s
799: 52.2 310 M
800: (   int greeting_width = glutBitmapLength \(\font, glgreeting\);) s
801: 25.8 298 M (86:) s
802: 52.2 298 M
803: (   int greeting_height = glutBitmapHeight \(\font\);) s
804: 25.8 286 M (87:) s
805: 25.8 274 M (88:) s
```

```
806: 52.2 274 M
807: (   glColor3ubv \(\color\);) s
808: 25.8 262 M (89:) s
809: 25.8 250 M (90:) s
810: 52.2 250 M
811: (   float xpos = window.width / 2.0 - greeting_width / 2.0;) s
812: 25.8 238 M (91:) s
813: 52.2 238 M
814: (   float ypos = window.height / 2.0 - greeting_height / 4.0;) s
815: 25.8 226 M (92:) s
816: 52.2 226 M
817: (   glRasterPos2f \(\xpos, ypos\);) s
818: 25.8 214 M (93:) s
819: 25.8 202 M (94:) s
820: 52.2 202 M
821: (   glutBitmapString \(\font, glgreeting\);) s
822: 25.8 190 M (95:) s
823: 52.2 190 M
824: (}) s
825: 25.8 178 M (96:) s
826: 25.8 166 M (97:) s
827: 52.2 166 M
828: (void display\(\) {) s
829: 25.8 154 M (98:) s
830: 52.2 154 M
831: (   glClearColor \(\0.15, 0.15, 0.15, 1.0\);) s
832: 25.8 142 M (99:) s
833: 52.2 142 M
834: (   glClear \(\GL_COLOR_BUFFER_BIT\);) s
835: 19.2 130 M (100:) s
836: 19.2 118 M (101:) s
837: 52.2 118 M
838: (   draw_rectangle \(\colors[0]\);) s
839: 19.2 106 M (102:) s
840: 52.2 106 M
841: (   draw_ellipse \(\colors[1]\);) s
842: 19.2 94 M (103:) s
843: 52.2 94 M
844: (   draw_greeting \(*greetings, colors[2]\);) s
845: 19.2 82 M (104:) s
846: 19.2 70 M (105:) s
847: 52.2 70 M
848: (   glutSwapBuffers\(\);) s
849: 19.2 58 M (106:) s
850: 52.2 58 M
851: (}) s
852: 19.2 46 M (107:) s
853: _R
854: S
855: %%Page: (3) 3
856: %%BeginPageSetup
857: _S
858: 38 24 translate
859: /pagenum 3 def
860: /fname (hello-world.cpp) def
861: /fdir (.) def
862: /ftail (hello-world.cpp) def
863: % User defined strings:
```

```
864: /pagenumstr (3) def
865: /moddatestr (05/15/19) def
866: /pagecountstr (/4) def
867: /modtimestr (17:16:15) def
868: /user_header_p true def
869: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
870: /user_header_center_str () def
871: /user_header_right_str () def
872: /user_footer_p false def
873: %%EndPageSetup
874: column_borders
875: do_header
876: 19.2 694 M (108:) s
877: 19.2 682 M (109:) s
878: 52.2 682 M
879: (void invert_colors\(\) {) s
880: 19.2 670 M (110:) s
881: 52.2 670 M
882: ( for \ (size_t color = 0; color < 3; ++color\ ) {) s
883: 19.2 658 M (111:) s
884: 52.2 658 M
885: ( for \ (size_t rgb = 0; rgb < 3; ++rgb\ ) {) s
886: 19.2 646 M (112:) s
887: 52.2 646 M
888: ( colors[color][rgb] ^= 0xFF;) s
889: 19.2 634 M (113:) s
890: 52.2 634 M
891: ( } ) s
892: 19.2 622 M (114:) s
893: 52.2 622 M
894: ( } ) s
895: 19.2 610 M (115:) s
896: 52.2 610 M
897: ( } ) s
898: 19.2 598 M (116:) s
899: 19.2 586 M (117:) s
900: 52.2 586 M
901: (void keyboard \ (GLubyte key, int, int\ ) {) s
902: 19.2 574 M (118:) s
903: 52.2 574 M
904: ( enum {BS = 8, LF = 10, CR = 13, ESC = 27, DEL = 127};) s
905: 19.2 562 M (119:) s
906: 52.2 562 M
907: ( switch \ (key\ ) {) s
908: 19.2 550 M (120:) s
909: 52.2 550 M
910: ( case ' ': case BS: case CR: case LF: case DEL:) s
911: 19.2 538 M (121:) s
912: 52.2 538 M
913: ( invert_colors\(\);) s
914: 19.2 526 M (122:) s
915: 52.2 526 M
916: ( break;) s
917: 19.2 514 M (123:) s
918: 52.2 514 M
919: ( case 'c': case 'C':) s
920: 19.2 502 M (124:) s
```

```
921: 52.2 502 M
922: (          ++colors;) s
923: 19.2 490 M (125:) s
924: 52.2 490 M
925: (          break;) s
926: 19.2 478 M (126:) s
927: 52.2 478 M
928: (          case 'f': case 'F':) s
929: 19.2 466 M (127:) s
930: 52.2 466 M
931: (          ++glut_fonts;) s
932: 19.2 454 M (128:) s
933: 52.2 454 M
934: (          break;) s
935: 19.2 442 M (129:) s
936: 52.2 442 M
937: (          case 'g': case 'G':) s
938: 19.2 430 M (130:) s
939: 52.2 430 M
940: (          ++greetings;) s
941: 19.2 418 M (131:) s
942: 52.2 418 M
943: (          break;) s
944: 19.2 406 M (132:) s
945: 52.2 406 M
946: (          case 'q': case 'Q': case ESC:) s
947: 19.2 394 M (133:) s
948: 52.2 394 M
949: (          exit \ (EXIT_SUCCESS\);) s
950: 19.2 382 M (134:) s
951: 52.2 382 M
952: (    }) s
953: 19.2 370 M (135:) s
954: 52.2 370 M
955: (    glutPostRedisplay\(\);) s
956: 19.2 358 M (136:) s
957: 52.2 358 M
958: (}) s
959: 19.2 346 M (137:) s
960: 19.2 334 M (138:) s
961: 52.2 334 M
962: (void mouse \ (int button, int state, int, int\) {}) s
963: 19.2 322 M (139:) s
964: 52.2 322 M
965: (    if \ (state == GLUT_DOWN\) {}) s
966: 19.2 310 M (140:) s
967: 52.2 310 M
968: (    switch \ (button\) {}) s
969: 19.2 298 M (141:) s
970: 52.2 298 M
971: (    case GLUT_LEFT_BUTTON:) s
972: 19.2 286 M (142:) s
973: 52.2 286 M
974: (    ++glut_fonts;) s
975: 19.2 274 M (143:) s
976: 52.2 274 M
977: (    break;) s
978: 19.2 262 M (144:) s
```

```
979: 52.2 262 M
980: (          case GLUT_MIDDLE_BUTTON:) s
981: 19.2 250 M (145:) s
982: 52.2 250 M
983: (          ++greetings;) s
984: 19.2 238 M (146:) s
985: 52.2 238 M
986: (          break;) s
987: 19.2 226 M (147:) s
988: 52.2 226 M
989: (          case GLUT_RIGHT_BUTTON:) s
990: 19.2 214 M (148:) s
991: 52.2 214 M
992: (          ++colors;) s
993: 19.2 202 M (149:) s
994: 52.2 202 M
995: (          break;) s
996: 19.2 190 M (150:) s
997: 52.2 190 M
998: (          }) s
999: 19.2 178 M (151:) s
1000: 52.2 178 M
1001: (          }) s
1002: 19.2 166 M (152:) s
1003: 52.2 166 M
1004: (    glutPostRedisplay\\(\\);) s
1005: 19.2 154 M (153:) s
1006: 52.2 154 M
1007: (}) s
1008: 19.2 142 M (154:) s
1009: _R
1010: S
1011: %%Page: (4) 4
1012: %%BeginPageSetup
1013: _S
1014: 38 24 translate
1015: /pagenum 4 def
1016: /fname (hello-world.cpp) def
1017: /fdire (.) def
1018: /ftail (hello-world.cpp) def
1019: % User defined strings:
1020: /pagenumstr (4) def
1021: /moddatestr (05/15/19) def
1022: /pagecountstr (/4) def
1023: /modtimestr (17:16:15) def
1024: /user_header_p true def
1025: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1026: /user_header_center_str () def
1027: /user_header_right_str () def
1028: /user_footer_p false def
1029: %%EndPageSetup
1030: column_borders
1031: do_header
1032: 19.2 694 M (155:) s
1033: 19.2 682 M (156:) s
1034: 52.2 682 M
1035: (void reshape \\(int width, int height\\) {}) s
```

```
1036: 19.2 670 M (157:) s
1037: 52.2 670 M
1038: ( window.width = width;) s
1039: 19.2 658 M (158:) s
1040: 52.2 658 M
1041: ( window.height = height;) s
1042: 19.2 646 M (159:) s
1043: 52.2 646 M
1044: ( glMatrixMode \ (GL_PROJECTION\);) s
1045: 19.2 634 M (160:) s
1046: 52.2 634 M
1047: ( glLoadIdentity\(\);) s
1048: 19.2 622 M (161:) s
1049: 52.2 622 M
1050: ( gluOrtho2D \ (0, window.width, 0, window.height\);) s
1051: 19.2 610 M (162:) s
1052: 52.2 610 M
1053: ( glMatrixMode \ (GL_MODELVIEW\);) s
1054: 19.2 598 M (163:) s
1055: 52.2 598 M
1056: ( glViewport \ (0, 0, window.width, window.height\);) s
1057: 19.2 586 M (164:) s
1058: 52.2 586 M
1059: ( glutPostRedisplay\(\);) s
1060: 19.2 574 M (165:) s
1061: 52.2 574 M
1062: (}) s
1063: 19.2 562 M (166:) s
1064: 19.2 550 M (167:) s
1065: 52.2 550 M
1066: (void print_howto\(\) {) s
1067: 19.2 538 M (168:) s
1068: 52.2 538 M
1069: (cout << R"\() s
1070: 19.2 526 M (169:) s
1071: 52.2 526 M
1072: (To cycle the colors: right mouse button or key 'c' or 'C'.) s
1073: 19.2 514 M (170:) s
1074: 52.2 514 M
1075: (To cycle the fonts: left mouse button or key 'f' or 'F'.) s
1076: 19.2 502 M (171:) s
1077: 52.2 502 M
1078: (To cycle the greetings: middle mouse button or key 'g' or 'G'.) s
1079: 19.2 490 M (172:) s
1080: 52.2 490 M
1081: (To invert the colors: key Space, Backspace, Return, or Delete.) s
1082: 19.2 478 M (173:) s
1083: 52.2 478 M
1084: (To quit: key 'q' or 'Q' or ESC.) s
1085: 19.2 466 M (174:) s
1086: 52.2 466 M
1087: (\");) s
1088: 19.2 454 M (175:) s
1089: 52.2 454 M
1090: (}) s
1091: 19.2 442 M (176:) s
1092: 19.2 430 M (177:) s
1093: 52.2 430 M
```



```
1094: (int main \((int argc, char** argv\) {) s
1095: 19.2 418 M (178:) s
1096: 52.2 418 M
1097: (    print_howto\(\);) s
1098: 19.2 406 M (179:) s
1099: 52.2 406 M
1100: (    window.name = basename \((argv[0]\);) s
1101: 19.2 394 M (180:) s
1102: 52.2 394 M
1103: (    glutInit \((&argc, argv\);) s
1104: 19.2 382 M (181:) s
1105: 52.2 382 M
1106: (    glutInitDisplayMode \((GLUT_RGBA | GLUT_DOUBLE\);) s
1107: 19.2 370 M (182:) s
1108: 52.2 370 M
1109: (    glutInitWindowSize \((window.width, window.height\);) s
1110: 19.2 358 M (183:) s
1111: 52.2 358 M
1112: (    glutCreateWindow \((window.name.c_str\(\)\);) s
1113: 19.2 346 M (184:) s
1114: 52.2 346 M
1115: (    glutDisplayFunc \((display\);) s
1116: 19.2 334 M (185:) s
1117: 52.2 334 M
1118: (    glutReshapeFunc \((reshape\);) s
1119: 19.2 322 M (186:) s
1120: 52.2 322 M
1121: (    glutKeyboardFunc \((keyboard\);) s
1122: 19.2 310 M (187:) s
1123: 52.2 310 M
1124: (    glutMouseFunc \((mouse\);) s
1125: 19.2 298 M (188:) s
1126: 52.2 298 M
1127: (    glutMainLoop\(\);) s
1128: 19.2 286 M (189:) s
1129: 52.2 286 M
1130: (    return 0;) s
1131: 19.2 274 M (190:) s
1132: 52.2 274 M
1133: (}) s
1134: 19.2 262 M (191:) s
1135: 19.2 250 M (192:) s
1136: 52.2 250 M
1137: (//TEST// mkpspdf hello-world.cpp.ps hello-world.cpp*) s
1138: 19.2 238 M (193:) s
1139: _R
1140: S
1141: %%Page: (1) 5
1142: %%BeginPageSetup
1143: _S
1144: 38 24 translate
1145: /pagenum 1 def
1146: /fname (hello-world.cpp.log) def
1147: /fdir (.) def
1148: /ftail (hello-world.cpp.log) def
1149: % User defined strings:
1150: /pagenumstr (1) def
1151: /moddatestr (05/15/19) def
```

```
1152: /pagecountstr (/1) def
1153: /modtimestr (17:16:23) def
1154: /user_header_p true def
1155: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1156: /user_header_center_str () def
1157: /user_header_right_str () def
1158: /user_footer_p false def
1159: %%EndPageSetup
1160: column_borders
1161: do_header
1162: 32.4 694 M (1:) s
1163: 52.2 694 M
1164: (@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ mkc: starting hello-world.cpp) s
1165: 32.4 682 M (2:) s
1166: 52.2 682 M
1167: (checksource hello-world.cpp) s
1168: 32.4 670 M (3:) s
1169: 52.2 670 M
1170: (ident hello-world.cpp) s
1171: 32.4 658 M (4:) s
1172: 52.2 658 M
1173: (hello-world.cpp:) s
1174: 32.4 646 M (5:) s
1175: 52.2 646 M
1176: (      $Id: hello-world.cpp,v 1.26 2019-05-15 17:13:01-07 - - $) s
1177: 32.4 634 M (6:) s
1178: 52.2 634 M
1179: (cpplint.py.perl hello-world.cpp) s
1180: 32.4 622 M (7:) s
1181: 52.2 622 M
1182: (Done processing hello-world.cpp) s
1183: 32.4 610 M (8:) s
1184: 52.2 610 M
1185: (g++ -g -O0 -Wall -Wextra -Wpedantic -Wshadow -fdiagnostics-color=never
-) s
1186: 5 598 M
1187: (std=gnu++2a -Wold-style-cast hello-world.cpp -o hello-world -lm -lglut
-lGLU -l) s
1188: 5 586 M
1189: (GL -lX11 -ldrm -lm) s
1190: 32.4 574 M (9:) s
1191: 52.2 574 M
1192: (rm -f hello-world.o) s
1193: 25.8 562 M (10:) s
1194: 52.2 562 M
1195: (@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ mkc: finished hello-world.cpp) s
1196: _R
1197: S
1198: %%Page: (1) 6
1199: %%BeginPageSetup
1200: _S
1201: 38 24 translate
1202: /pagenum 1 def
1203: /fname (hello-world.cpp.pdf) def
1204: /fdire (.) def
1205: /ftail (hello-world.cpp.pdf) def
1206: % User defined strings:
```

```
1207: /pagenumstr (1) def
1208: /moddatestr (05/15/19) def
1209: /pagecountstr (/24) def
1210: /modtimestr (17:13:33) def
1211: /user_header_p true def
1212: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1213: /user_header_center_str () def
1214: /user_header_right_str () def
1215: /user_footer_p false def
1216: %%EndPageSetup
1217: column_borders
1218: do_header
1219: 32.4 694 M (1:) s
1220: 52.2 694 M
1221: (%PDF-1.4) s
1222: 32.4 682 M (2:) s
1223: 52.2 682 M
1224: (%Çi\217ç) s
1225: 32.4 670 M (3:) s
1226: 52.2 670 M
1227: (5 0 obj) s
1228: 32.4 658 M (4:) s
1229: 52.2 658 M
1230: (<</Length 6 0 R/Filter /FlateDecode>>) s
1231: 32.4 646 M (5:) s
1232: 52.2 646 M
1233: (stream) s
1234: 32.4 634 M (6:) s
1235: 52.2 634 M
1236: (x\234\205Vioă6\024ü@_ñ\232|-\\234X2IŸP\\003H¶^o) s
1237: 32.4 622 M (7:) s
1238: 52.2 622 M
1239: (gŮİj[\024q \(\022c«Đá\225è\034) s
1240: 5 622 M
1241: (ðŒK]&}\004µ\035\233\026ç) s
1242: 5 622 M
1243: (gæQt¾\003ò1 úŬ}F\2312°r`Q\)) s
1244: 170 622 M
1245: (|\212á" &\002Ë°\0218\210\177+©òU+àAi\212àªÅ8\006A\220\)) s
1246: 5 610 M
1247: (\226\203°q*_ÆX\nÇ¶»\201~Ã%gm\031Ë\205òJÁí,û\21028÷¹,\0270\001ÿ
Ni\225b°\210nŮ&) s
1248: 5 598 M
1249: (\006Çâ\2273EEÖ) s
1250: 90.8 598 M
1251: (ó\2277ðŸQ4nŮ\226ç06h\230è.ø±çbg\214\215q;?ñ\225/\212éö"\035pW{1
î½¶) s
1252: 5 586 M
1253: (¾\007Ä-©$\\0050ÖM×á\034\236PjÀ5y) s
1254: 5 586 M
1255: (Å-ĐÖ\021&\036\007x\002Ff;Ëy±YOkÄ±tD@#°Ó \2264M\013í;(\ÓX\217V«Æ
æ\213 b6\214) s
1256: 5 574 M
1257: (\034r\034e«) s
1258: 32.4 562 M (8:) s
1259: 52.2 562 M
1260: (#O{ËFgU\225,ò\214æ¬\032ŸáíB{ÄX+v4_#\\211jc\030Äëéb) s
```

```
1261: _R
1262: S
1263: %%Page: (2) 7
1264: %%BeginPageSetup
1265: _S
1266: 38 24 translate
1267: /pagenum 2 def
1268: /fname (hello-world.cpp.pdf) def
1269: /fdir (.) def
1270: /ftail (hello-world.cpp.pdf) def
1271: % User defined strings:
1272: /pagenumstr (2) def
1273: /moddatestr (05/15/19) def
1274: /pagecountstr (/24) def
1275: /modtimestr (17:13:33) def
1276: /user_header_p true def
1277: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1278: /user_header_center_str () def
1279: /user_header_right_str () def
1280: /user_footer_p false def
1281: %%EndPageSetup
1282: column_borders
1283: do_header
1284: 5 694 M
1285: (ü%\231s\220n\202S^\232\)*%\036\0174\033!u4\202ä\213x) s
1286: _R
1287: S
1288: %%Page: (3) 8
1289: %%BeginPageSetup
1290: _S
1291: 38 24 translate
1292: /pagenum 3 def
1293: /fname (hello-world.cpp.pdf) def
1294: /fdir (.) def
1295: /ftail (hello-world.cpp.pdf) def
1296: % User defined strings:
1297: /pagenumstr (3) def
1298: /moddatestr (05/15/19) def
1299: /pagecountstr (/24) def
1300: /modtimestr (17:13:33) def
1301: /user_header_p true def
1302: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1303: /user_header_center_str () def
1304: /user_header_right_str () def
1305: /user_footer_p false def
1306: %%EndPageSetup
1307: column_borders
1308: do_header
1309: 5 694 M
1310: (;J\207+\200ub\003A0Ó\220Ya\013Ů,\021Ö\220\003\032\177\036\0
17nüß\224°\2053E%ãÃ/) s
1311: 5 682 M
1312: (\212\177r-\032\035i\217I\036Yë\230ÂŮ(\013Ůö}\003®\001æ\036
\)*V00\023\030k\017) s
1313: 5 670 M
1314: (\223Ñ~(\237\004ÂPcP\216$_) s
```

```
1315: 163.4 670 M
1316: (\\204³\\207,$\\021+J\\201p;Ä°â\\205\\220\\207\\031-VaD;bn\\233) s
1317: 5 658 M
1318: (\\006αzμ+İÖ\\233]Ww\\213ç\\206öx$³Ñ]Ié"]3]2\\212ñ\\0362Mn\\0274iA*Pα\\2
06) s
1319: 5 658 M
1320: (Ñ\\216\\017Ë°) s
1321: _R
1322: S
1323: %%Page: (4) 9
1324: %%BeginPageSetup
1325: _S
1326: 38 24 translate
1327: /pagenum 4 def
1328: /fname (hello-world.cpp.pdf) def
1329: /fdire (.) def
1330: /ftail (hello-world.cpp.pdf) def
1331: % User defined strings:
1332: /pagenumstr (4) def
1333: /moddatestr (05/15/19) def
1334: /pagecountstr (/24) def
1335: /modtimestr (17:13:33) def
1336: /user_header_p true def
1337: /user_header_left_str ($cmpls109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1338: /user_header_center_str () def
1339: /user_header_right_str () def
1340: /user_footer_p false def
1341: %%EndPageSetup
1342: column_borders
1343: do_header
1344: 5 694 M
1345: (#FËαbITaQ\\007lIá!ÉãâA\\027ô}\\220Ûø:bÝ<<\\013@\\237"\\000´á4\\036ß) s
1346: 394.4 694 M
1347: (\\200-\\000I^3Äl ) s
1348: 5 682 M
1349: (İ\\206k¾H g\\033´αÉbÉâ\\231x¶\\214ê³|ét\\001b~wHúÜ\\030ÍViËx\\032i\\21
lil®) s
1350: 440.6 682 M
1351: (\\022~-`"9\\202) s
1352: 5 670 M
1353: (•-EOQJ\\003\\216*CP@É"!B\\Tä\\025\\203¶Ço;Æ\\206¹\\0222\\211!E\\222ük\\
003î½.Ë\\232:\\203g$) s
1354: 5 658 M
1355: (\\031"|Ä¼ü\\Mò\\204%aÊ Ê á]Ů,W\\177\\231\\017Æ\\202Ej\\201ühdíÖ\\03
5±sμ-\\237\\017àüEp) s
1356: 5 646 M
1357: (ø>\\036[üİÄ\\017\\206FÑÉ\\-KøaÇÖeP\\222_o|Ÿ¼\\001\\211îü?²ë\\033©fË\\20
6w\\222>ÖÔçPŸ2´μâ\\) s
1358: 5 634 M
1359: (\\025Y\\236nj\\177jgö\\232²Öy#ei 2!Ñ@~%/D\\236\\236v\\226E\\025P\\02
2&\\224¾\\203m]ø) s
1360: 5 622 M
1361: (\\200&!É \\207ü\\235°e"í"Ä8"»ß1Ÿ.R) s
1362: 5 622 M
1363: (ks&ö-ŮöÖ\\037Y°â$\\007â£JŮ\\220:uô©>\\234\\207öW}:ÿp4\\024 w\\006\\025
qBü-îÖ\\025PŸŮ2) s
1364: 5 610 M
```

```
1365: (\\214\\223\\(\\201;¼\\026-u¹JÊýhZ\\024ñí\\023=@nç\\035C&î) s
1366: 5 610 M
1367: (\\231}LÔÛúö\\211ßEW\\223_ùÆyÇï;Ç\\217\\037\\207\\200\\036\\021jß¥[Ê4v\\
212|W\\223Êç¾¬-è) s
1368: 5 598 M
1369: (\\213â2s§ì|ö²]Ö×ÊUÖáÈ;\\222\\223÷|û$EÉ\\023çÒ\\207-\\224aC%qkoÛ:\\207¹
î\\213$æDö¹\\037Û) s
1370: 5 586 M
1371: (\\025ü7[j\\237\\)uf:ûæ\\007ç\\027páÛ\\037\\201\\177q9ü\\032\\ÿ~yö9 |\\02
4¶w\\030ÿi2ûsâ_|8) s
1372: 5 574 M
1373: (\\013°+Ð\\026:\\214ö\\202ô¿\\003lI@%ÖC«ùÊipyøçü\\0070\\036,\\003endstre
am) s
1374: 32.4 562 M (9:) s
1375: 52.2 562 M
1376: (endobj) s
1377: 25.8 550 M (10:) s
1378: 52.2 550 M
1379: (6 0 obj) s
1380: 25.8 538 M (11:) s
1381: 52.2 538 M
1382: (1061) s
1383: 25.8 526 M (12:) s
1384: 52.2 526 M
1385: (endobj) s
1386: 25.8 514 M (13:) s
1387: 52.2 514 M
1388: (15 0 obj) s
1389: 25.8 502 M (14:) s
1390: 52.2 502 M
1391: (<</Length 16 0 R/Filter /FlateDecode>>) s
1392: 25.8 490 M (15:) s
1393: 52.2 490 M
1394: (stream) s
1395: 25.8 478 M (16:) s
1396: 52.2 478 M
1397: (x\\234\\225VmoÛ6\\020p®_q\\037\\206Mq-\\231¤%RJ\\233\\001s\\221|\\035¼%
M¼\\001C]) s
1398: 5 466 M
1399: (\\030\\216MË\\032dI\\225\\224:ÆDÿ>\\222z£\\224hÍ\\034;âË=\\017îî¹\\223ô
\\005\\220\\215\\001Ê¿) s
1400: 5 454 M
1401: (ê°9\\030\\223[\\006An ,2|\\036\\002â p$\\024\\001Cb\\226qãîpáh(\\020Û\\
\\2266lJ\\020\\034) s
1402: _R
1403: S
1404: %%Page: (5) 10
1405: %%BeginPageSetup
1406: _S
1407: 38 24 translate
1408: /pagenum 5 def
1409: /fname (hello-world.cpp.pdf) def
1410: /fdire (.) def
1411: /ftail (hello-world.cpp.pdf) def
1412: % User defined strings:
1413: /pagenumstr (5) def
1414: /moddatestr (05/15/19) def
1415: /pagecountstr (/24) def
```

```
1416: /modtimestr (17:13:33) def
1417: /user_header_p true def
1418: /user_header_left_str ($cmpls109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1419: /user_header_center_str () def
1420: /user_header_right_str () def
1421: /user_footer_p false def
1422: %%EndPageSetup
1423: column_borders
1424: do_header
1425: 5 694 M
1426: (\\227;j\\034éË\\030•Ëä\\230z\\215I9Ü\\013Ö\\2221\\013\\214/\\006.ÇÕes\\
200ÜB,å\\001&°Ø\\031¥) s
1427: 5 682 M
1428: (§\\030\\bsê`'®X>\\030&r'X|Ÿ³Åß\\206\\2051êú\\214R°0±=X1) s
1429: 5 682 M
1430: (\\023³s<=/÷/\\027ÆGÃñk'\\231øÉ\\030UxCçû@<I¥y\\200=Ûñ<ÁáÛ¥\\017D\\222KS
\\032R\\033aâ) s
1431: 5 670 M
1432: (\\013céÄÄ\\)w\\005/vä¶E\\230k#\\002\\026±\\231²Øó\\(J¬c\\222E[{\\223|*\\0
22,\\016AÄQ\\214Ää) s
1433: 5 658 M
1434: (\\207î!î1ð-äaðK\\236\\207A|àq\\2210çõ}'=b1%\\)\\217\\203hçQ5\\001#\\030î
.Æ¾Zpt*\\202eðT) s
1435: 5 646 M
1436: (\\021\\227;=\\227,R\\200¹±\\030}2]çüîç) s
1437: 216.2 646 M
1438: (\\231_\\223p\\013û1}\\e|s-ÃÑ\\034\\226æ&\\211ó\\002®æ) s
1439: 5 634 M
1440: (\\017+§\\202\\217'\\223DI¶<\\203\\177î>/~-ñn\\205\\007\\200 \\232ñ \\21
4\\005îj¾°¹\\236ÿuuÿû) s
1441: 5 622 M
1442: (ðïukKuÛ•\\222kúpÿU\\035fx5S|\\233pÉ³\\202?\\222\\235°Dc@\\035CoÄð\\030Æ
Ûäh\\037Äm±icü) s
1443: 5 610 M
1444: (\\027aªÛ\\236\\207Ä¾Dñ\\024) s
1445: 5 610 M
1446: (;7) s
1447: _R
1448: S
1449: %%Page: (6) 11
1450: %%BeginPageSetup
1451: _S
1452: 38 24 translate
1453: /pagenum 6 def
1454: /fname (hello-world.cpp.pdf) def
1455: /fdire (.) def
1456: /ftail (hello-world.cpp.pdf) def
1457: % User defined strings:
1458: /pagenumstr (6) def
1459: /moddatestr (05/15/19) def
1460: /pagecountstr (/24) def
1461: /modtimestr (17:13:33) def
1462: /user_header_p true def
1463: /user_header_left_str ($cmpls109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1464: /user_header_center_str () def
1465: /user_header_right_str () def
```

```
1466: /user_footer_p false def
1467: %%EndPageSetup
1468: column_borders
1469: do_header
1470: 5 694 M
1471: (Â:è2P.íî6©¶¿©%\223) s
1472: 25.8 682 M (17:) s
1473: 52.2 682 M
1474: (¡~*w\236*$J"Ló\027éCÿ\207>ôâúPM\237Ů\207J\224¬\013øð"xÃ\005\02
0\030Ão«) s
1475: 5 670 M
1476: (\233\0170\001êh@o) s
1477: 110.6 670 M
1478: ("².\200°) s
1479: 156.8 670 M
1480: (\002LlWCûCè2ā-¼\232÷ð) s
1481: _R
1482: S
1483: %%Page: (7) 12
1484: %%BeginPageSetup
1485: _S
1486: 38 24 translate
1487: /pagenum 7 def
1488: /fname (hello-world.cpp.pdf) def
1489: /fdir (.) def
1490: /ftail (hello-world.cpp.pdf) def
1491: % User defined strings:
1492: /pagenumstr (7) def
1493: /moddatestr (05/15/19) def
1494: /pagecountstr (/24) def
1495: /modtimestr (17:13:33) def
1496: /user_header_p true def
1497: /user_header_left_str ($cmpls109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1498: /user_header_center_str () def
1499: /user_header_right_str () def
1500: /user_footer_p false def
1501: %%EndPageSetup
1502: column_borders
1503: do_header
1504: 5 694 M
1505: (á\037\223Ÿ.çÅsç#) s
1506: 5 694 M
1507: (\217\207ð$>^s@' -Ã.É\224\024%A±ç*oèu5|Óm^yuQf•#0\233¶\214âÖÄ\22
3&¹rFF!\013#) s
1508: 5 682 M
1509: (\027g\)\032\201~U\207«9æ<Ks*iª`F\220«ðiyNOxŮ\016O$=mOcE©\227\02
2Ôªî[»Êp³]\230xm) s
1510: 5 670 M
1511: (\027æ×îâ¡'í\022d\234\027a\0344Ÿ\222\027\231\230p) s
1512: 315.2 670 M
1513: (öÆ\030¼ŮGp3ÊWÆAÔ\034pÑŮ\223N\036) s
1514: 5 658 M
1515: (Ä'âa\ð,Íx±Ů¬ôâM\227ægá]ÍcoVÂE\031q\035³é5÷\003OSJÆ8\022\205\024
ËÄ\033\005ÑC±) s
1516: 5 646 M
1517: (\222\223¼M\224$é!îoB^Ōí&A³°8¬Ō¹xP\210ŸŸ\)\)ÆZXzâ=:À×4`Kø¾\*
ŮHX\023\211÷çû) s
```



```
1518: 5 634 M
1519: (\\215é5âúZÿöê¼ß´`ôcíµç\\217û\\$\\016\\227FÀ:Y³î tø\\210\\036Ë-Ð\\227g7I>
P÷|ßËé;:°NŸ\\235ª) s
1520: 5 622 M
1521: (Đihā»Ÿ&ðicÊ:M\\020æi´>ÉzÔ*Űif?âëLI \\237c6vç Ÿçvç êûO°âSâíõüúv5ûăŸ»Kqû°
"A\\026µŌ+\\) s
1522: 5 610 M
1523: (ù\\002\\207\\220z\\013\\221L\\030i2<óú!\\034Ê?;İüă\\030\\221\\036D\\177
\\036*\\000î\\001|=) s
1524: 5 598 M
1525: (\\200vG\\030Ōă|) s
1526: _R
1527: S
1528: %%Page: (8) 13
1529: %%BeginPageSetup
1530: _S
1531: 38 24 translate
1532: /pagemum 8 def
1533: /fname (hello-world.cpp.pdf) def
1534: /fdire (.) def
1535: /ftail (hello-world.cpp.pdf) def
1536: % User defined strings:
1537: /pagemumstr (8) def
1538: /moddatestr (05/15/19) def
1539: /pagecountstr (/24) def
1540: /modtimestr (17:13:33) def
1541: /user_header_p true def
1542: /user_header_left_str ($cmpts109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1543: /user_header_center_str () def
1544: /user_header_right_str () def
1545: /user_footer_p false def
1546: %%EndPageSetup
1547: column_borders
1548: do_header
1549: 5 694 M
1550: (\\025\\2324h\\001uê\\234bäv\\225°;®ŌŰĂñç³¼{sÂ\\210v\\205ĂHŌ¼zwûhü\\013\
\r,\\203endstream) s
1551: 25.8 682 M (18:) s
1552: 52.2 682 M
1553: (endobj) s
1554: 25.8 670 M (19:) s
1555: 52.2 670 M
1556: (16 0 obj) s
1557: 25.8 658 M (20:) s
1558: 52.2 658 M
1559: (1033) s
1560: 25.8 646 M (21:) s
1561: 52.2 646 M
1562: (endobj) s
1563: 25.8 634 M (22:) s
1564: 52.2 634 M
1565: (20 0 obj) s
1566: 25.8 622 M (23:) s
1567: 52.2 622 M
1568: (<</Length 21 0 R/Filter /FlateDecode>>) s
1569: 25.8 610 M (24:) s
1570: 52.2 610 M
```

```
1571: (stream) s
1572: 25.8 598 M (25:) s
1573: 52.2 598 M
1574: (x\\234\\215UÛrÚH\\024}i-,\\017©\\002\\022$zÑ\\212Ç\\0171\\006ÆS$\\031\\
203\\3U¶\\207b) s
1575: 5 586 M
1576: (\\021²\\022          aIÄvRû÷é\\226dh-Tlct¹}û\\234s7ó) s
1577: 295.4 586 M
1578: (X%\\200Åoñ\\205"75ÁK\\020\\2061b\\026) s
1579: 5 574 M
1580: (\\006ªaĐ\\231\\201ÄÄüSiç\\031Òā      e\\227'\\232Ç\\230\\214b) s
1581: 341.6 574 M
1582: (\\221nâÂ\\016d7!Gwn\\033Ö!$7) s
1583: 5 562 M
1584: (\\0378j\\216\\030{è\\021\\221Û.\\036«\\020.\\034.Ë\\002BÁÛ \\)\\001\\2
35ª\\206i\\0210uî\\016Q) s
1585: 5 550 M
1586: (\\033ë=Â_vÇù\\212\\024¬\\032ºm\\032\\006\\(\\204ª\\0268kÔ&f\\237º~~>tĐ5Ò
îW\\221&ÿ\\0239fé) s
1587: 5 538 M
1588: (\\235â•\\201Z\\002JR@,U³,\\216a«¹\\006&ÄE\\(É\\003) s
1589: 5 538 M
1590: (\\025\\023jó'! şâš\\034\\227hâX;|@b) s
1591: 25.8 526 M (26:) s
1592: 25.8 514 M (27:) s
1593: 52.2 514 M
1594: (UÍ,âÂ) s
1595: 5 514 M
1596: (\\202Hy\\212â`-@v»,\\023ÂI0Õ2D\\036òn\\025î\\022\\202mă\\)î}L\\022ßÛ\\20
6î6MzÂbé\\)î\\204\\(ÑîŸ) s
1597: 5 502 M
1598: (zAO\\202:$\\214átu          \\001p\\222\\2233yN|'ây\\0211ö\\005\\214èÄ\\0
049io¹Çîw\\024\\003) s
1599: 5 490 M
1600: (ãö÷Ê_\\203¿ŸîÆé|\\025\\005Q\\234Ûµi:ð³süü\\225\\207\\022\\204\\002Â&\\
\\212â®\\235ø?Ûy) s
1601: 25.8 478 M (28:) s
1602: 52.2 478 M
1603: (Y8\\234\\003>+î?\\200\\235Á\\207\\017Û\\207) s
1604: 25.8 466 M (29:) s
1605: 52.2 466 M
1606: (\\0069bTabo\\231\\203) s
1607: 164.4 466 M
1608: (£\\200âf\\005\\200\\226\\000øO.ö6{Ûßò\\013÷ð\\037\\207y\\036\\215) s
1609: 5 454 M
1610: (îpk¬tî\\227tç\\035Od•^,s\\037w\\030ŸN«83â\\232}s_\\226Ñ"ªóDÆ\\223Ÿò%u\\
205«Ëk\\231fo\\025) s
1611: 5 442 M
1612: (ŸÖ\\221îŸîCøylăY[ ]\\230\\214ø\\223â.) s
1613: _R
1614: S
1615: %%Page: (9) 14
1616: %%BeginPageSetup
1617: _S
1618: 38 24 translate
1619: /pagenum 9 def
1620: /fname (hello-world.cpp.pdf) def
1621: /fdir (.) def
```

```
1622: /ftail (hello-world.cpp.pdf) def
1623: % User defined strings:
1624: /pagenumstr (9) def
1625: /moddatestr (05/15/19) def
1626: /pagecountstr (/24) def
1627: /modtimestr (17:13:33) def
1628: /user_header_p true def
1629: /user_header_left_str ($cmpts109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1630: /user_header_center_str () def
1631: /user_header_right_str () def
1632: /user_footer_p false def
1633: %%EndPageSetup
1634: column_borders
1635: do_header
1636: 5 694 M
1637: (|Ã`|\030Î\\006Üçf\\027.\\207\\023áfæ/9'û) s
1638: 236 694 M
1639: (\\225<ûéê\\201KâÔeB\\212K\\231^-\\026\\211\\013-höSë) s
1640: 5 682 M
1641: (bV\\030\\203iaLF\\205Ã9û\\022) s
1642: _R
1643: S
1644: %%Page: (10) 15
1645: %%BeginPageSetup
1646: _S
1647: 38 24 translate
1648: /pagenum 10 def
1649: /fname (hello-world.cpp.pdf) def
1650: /fdir (.) def
1651: /ftail (hello-world.cpp.pdf) def
1652: % User defined strings:
1653: /pagenumstr (10) def
1654: /moddatestr (05/15/19) def
1655: /pagecountstr (/24) def
1656: /modtimestr (17:13:33) def
1657: /user_header_p true def
1658: /user_header_left_str ($cmpts109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1659: /user_header_center_str () def
1660: /user_header_right_str () def
1661: /user_footer_p false def
1662: %%EndPageSetup
1663: column_borders
1664: do_header
1665: 5 694 M
1666: (©Ö½6+\\2224ZëÔ2v\\027ßä) s
1667: 137 694 M
1668: (Ö kÖ*«5hÉÜZ\\025-\\230-D\\006Ô\\177Ki4Pn\\016\\224f\\022ŸY$ô\\202} :) s
1669: 5 682 M
1670: (ßD|MePë•´v\\003-w \\035Ë´) s
1671: _R
1672: S
1673: %%Page: (11) 16
1674: %%BeginPageSetup
1675: _S
1676: 38 24 translate
1677: /pagenum 11 def
```

```
1678: /fname (hello-world.cpp.pdf) def
1679: /fdir (.) def
1680: /ftail (hello-world.cpp.pdf) def
1681: % User defined strings:
1682: /pagenumstr (11) def
1683: /moddatestr (05/15/19) def
1684: /pagecountstr (/24) def
1685: /modtimestr (17:13:33) def
1686: /user_header_p true def
1687: /user_header_left_str ($cmpts109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1688: /user_header_center_str () def
1689: /user_header_right_str () def
1690: /user_footer_p false def
1691: %%EndPageSetup
1692: column_borders
1693: do_header
1694: 5 694 M
1695: (7Ð¸®\233ú[OfepnTY\031m' }<^¿Z|Æd~vÅu\237ý\224\217Öðß+g>»\031) s
1696: _R
1697: S
1698: %%Page: (12) 17
1699: %%BeginPageSetup
1700: _S
1701: 38 24 translate
1702: /pagenum 12 def
1703: /fname (hello-world.cpp.pdf) def
1704: /fdir (.) def
1705: /ftail (hello-world.cpp.pdf) def
1706: % User defined strings:
1707: /pagenumstr (12) def
1708: /moddatestr (05/15/19) def
1709: /pagecountstr (/24) def
1710: /modtimestr (17:13:33) def
1711: /user_header_p true def
1712: /user_header_left_str ($cmpts109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1713: /user_header_center_str () def
1714: /user_header_right_str () def
1715: /user_footer_p false def
1716: %%EndPageSetup
1717: column_borders
1718: do_header
1719: 5 694 M
1720: (\206³Y©Ó-y}\230Ô) s
1721: 5 694 M
1722: (Q•¿f$235°k?Û\005\213\227Ê°0f²jî<-\\032³äU\013f=\\227|xæ[\005Ë}\232FÛlÃ I\027©{jã) s
1723: 5 682 M
1724: (\230T\177\177#pÝ\210h8?\207ñäÆ\231_~ùçsù\202VnÂaurÆJl-\021YU3äÉ
päï/n\034çËg©ÄZm) s
1725: 5 670 M
1726: (5N\017\227VkGC$µÛv\034%|°¼\234) s
1727: _R
1728: S
1729: %%Page: (13) 18
1730: %%BeginPageSetup
1731: _S
```

```
1732: 38 24 translate
1733: /pagenum 13 def
1734: /fname (hello-world.cpp.pdf) def
1735: /fdire (.) def
1736: /ftail (hello-world.cpp.pdf) def
1737: % User defined strings:
1738: /pagenumstr (13) def
1739: /moddatestr (05/15/19) def
1740: /pagecountstr (/24) def
1741: /modtimestr (17:13:33) def
1742: /user_header_p true def
1743: /user_header_left_str ($cmyps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1744: /user_header_center_str () def
1745: /user_header_right_str () def
1746: /user_footer_p false def
1747: %%EndPageSetup
1748: column_borders
1749: do_header
1750: 5 694 M
1751: (\\033DÔ\\226âä"iÆ[4ÔÖâ"az5p³©\\016µÅ\\201Æ%Öi7ðëä\\226I\\203"\\223ÆûÔéÛ
çSg\\225ûÔ51\\237) s
1752: 5 682 M
1753: (Ûwnñ5ú\\037²5Esendstream) s
1754: 25.8 670 M (30:) s
1755: 52.2 670 M
1756: (endobj) s
1757: 25.8 658 M (31:) s
1758: 52.2 658 M
1759: (21 0 obj) s
1760: 25.8 646 M (32:) s
1761: 52.2 646 M
1762: (870) s
1763: 25.8 634 M (33:) s
1764: 52.2 634 M
1765: (endobj) s
1766: 25.8 622 M (34:) s
1767: 52.2 622 M
1768: (25 0 obj) s
1769: 25.8 610 M (35:) s
1770: 52.2 610 M
1771: (<</Length 26 0 R/Filter /FlateDecode>>) s
1772: 25.8 598 M (36:) s
1773: 52.2 598 M
1774: (stream) s
1775: 25.8 586 M (37:) s
1776: 52.2 586 M
1777: (x\\234\\215\\225]sÛ8\\024\\206iÿ+îtv\\026È\\200-\\031üÅv\\232@3iÉÖ\\20
0Û^\\224NÆ±) s
1778: 5 574 M
1779: (\\205ñÆ\\034[\\204f?pûJ\\226          2$\\235\\035',Kiûè\\034\\037\\035ó\\
\\000HÇ\\200ÄS¹\\206) s
1780: 5 562 M
1781: (\\231f,\\034\\210+) s
1782: 5 562 M
1783: (Ã¥6t\\021\\230#\\004ÖDFà ~w\\022m©Y°Ój\\023,µÆ\\031\\232) s
1784: 321.8 562 M
1785: (2îrP3NÖi\\214\\017Örl»î\\0229Ûpª$) s
```

```
1786: 5 550 M
1787: (\\226±ö a9n.a\\006ç>\\017Ë\\0051\\202¿Öd¤\\030,s•í\\021\\006Çãó\\231ÖE\\
\\226\\201û×ëü\\177j) s
1788: 5 538 M
1789: (\\003¤Û\\226çØ6) s
1790: _R
1791: S
1792: %%Page: (14) 19
1793: %%BeginPageSetup
1794: _S
1795: 38 24 translate
1796: /pagenum 14 def
1797: /fname (hello-world.cpp.pdf) def
1798: /fdir (.) def
1799: /ftail (hello-world.cpp.pdf) def
1800: % User defined strings:
1801: /pagenumstr (14) def
1802: /moddatestr (05/15/19) def
1803: /pagecountstr (/24) def
1804: /modtimestr (17:13:33) def
1805: /user_header_p true def
1806: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1807: /user_header_center_str () def
1808: /user_header_right_str () def
1809: /user_footer_p false def
1810: %%EndPageSetup
1811: column_borders
1812: do_header
1813: 5 694 M
1814: (°©»àGZ\\027;c<\\034Ëö©~Ÿh#o\\037¤Ã\\177"Ç:½×ö÷Àt\\005J\\211\\000»úÈu9Ãó
e) s
1815: _R
1816: S
1817: %%Page: (15) 20
1818: %%BeginPageSetup
1819: _S
1820: 38 24 translate
1821: /pagenum 15 def
1822: /fname (hello-world.cpp.pdf) def
1823: /fdir (.) def
1824: /ftail (hello-world.cpp.pdf) def
1825: % User defined strings:
1826: /pagenumstr (15) def
1827: /moddatestr (05/15/19) def
1828: /pagecountstr (/24) def
1829: /modtimestr (17:13:33) def
1830: /user_header_p true def
1831: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1832: /user_header_center_str () def
1833: /user_header_right_str () def
1834: /user_footer_p false def
1835: %%EndPageSetup
1836: column_borders
1837: do_header
1838: 5 694 M
1839: (#\\001\\027R,\\205¶\\216°éq±) s
```

```
1840: 156.8 694 M
1841: (Ähv9\\027\\217ÄöÄt,\\035\\23100u$VlH\\232ÖÄ\\216\\226iä\\207EQg) s
1842: 5 682 M
1843: (\\202Û&È\\034ÖD.Û%Î\\212) s
1844: 25.8 670 M (38:) s
1845: 52.2 670 M
1846: (#o°È\\214wU\\225ÄyFrV\\031ip\\027\\017~`< \\005ÉäÔPPİ #xýéb) s
1847: _R
1848: S
1849: %%Page: (16) 21
1850: %%BeginPageSetup
1851: _S
1852: 38 24 translate
1853: /pagenum 16 def
1854: /fname (hello-world.cpp.pdf) def
1855: /fdir (.) def
1856: /ftail (hello-world.cpp.pdf) def
1857: % User defined strings:
1858: /pagenumstr (16) def
1859: /moddatestr (05/15/19) def
1860: /pagecountstr (/24) def
1861: /modtimestr (17:13:33) def
1862: /user_header_p true def
1863: /user_header_left_str ($cmpls109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1864: /user_header_center_str () def
1865: /user_header_right_str () def
1866: /user_footer_p false def
1867: %%EndPageSetup
1868: column_borders
1869: do_header
1870: 5 694 M
1871: (Û«&çö\\234\\034++İ\\013[ÖX'D\\005f\\232\\177ö\\215İöäF"ûH\\223\\210?¹
j\\023\\024\\004VŸ$g) s
1872: 5 682 M
1873: (°K"¶É\\203\\030nH\\022oØª\\007\\177÷¾û\\037\\032«ÖX\\001,4\\217èN^-\\035
ö»tp|HŸ\\023©$r-) s
1874: 5 670 M
1875: (\\034"bİ \\216Öë\\200\\225É\\217k\\032\\211".g•\\237\\026ó\\017ó\\013ÿj
pÇª$\\230lª\\232f4) s
1876: 5 658 M
1877: (\\210®"pD\\023ö`ê¶\\205X\\025nç°ÛPsÂÛ"ßÊç\\017\\207\\211}ö*ÆüY\\220×óÉt
öâjúpí\\031ª\\236/) s
1878: 5 646 M
1879: (Û\\025`drë\\223Ÿ\\177²ö"\\225\\001ûD+¶ QR\\025ip\\222-Öhÿ-çø\\004`w$Ysô
Ö\\027%-óí\\206î) s
1880: 5 634 M
1881: (\\030\\025) s
1882: _R
1883: S
1884: %%Page: (17) 22
1885: %%BeginPageSetup
1886: _S
1887: 38 24 translate
1888: /pagenum 17 def
1889: /fname (hello-world.cpp.pdf) def
1890: /fdir (.) def
1891: /ftail (hello-world.cpp.pdf) def
```

```
1892: % User defined strings:
1893: /pagenumstr (17) def
1894: /moddatestr (05/15/19) def
1895: /pagecountstr (/24) def
1896: /modtimestr (17:13:33) def
1897: /user_header_p true def
1898: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1899: /user_header_center_str () def
1900: /user_header_right_str () def
1901: /user_footer_p false def
1902: %%EndPageSetup
1903: column_borders
1904: do_header
1905: 5 694 M
1906: (µĐÖ¾z!Ÿ2xû\\026\\026oV]ey_/\\237Bø\\024|\\004Ø\\206@HSZVc\\(ë2gt[\\021,Ů
2Fs %Ů\\223'è\\204) s
1907: 5 682 M
1908: (\\0351î\\tô\\003ÏA/ÄÖ\\2247Ç\\030R²~\\005µ\\226"-\\024~          \\025\\
227\\204°$\\2179.Kç) s
1909: 5 670 M
1910: (\\210İ¾) s
1911: 38 670 M
1912: (\\214%ð²\\0054\\017À$\\177$¼vj|Â•,\\202\\220ôá<) s
1913: 302 670 M
1914: (î+9\\020¶-ō¾ MHJ\\030Q\\201Ã\\003ða) s
1915: 5 658 M
1916: (\\2330Ěè<È/øēĚty;:öµ_ōƆ\\(ev\\216Ěî\\034ĚîîĚ,ú8\\013\\222¼éî \\214Ã>\\20
4\\233 <;\\0237) s
1917: 5 646 M
1918: (\\217íç;JĚ\\036\\235) s
1919: 5 646 M
1920: (ucî±±ō #¼-î\\202\\212ÔÃUWÀ¿;î-£\\213Ů\\207ø*OD'ü*£\\222á"r|*\\237Ě\\023
ŸŮu\\237ŸŮĀâû;ø) s
1921: 5 634 M
1922: (\\007ēñdpù|6msİSĚx:ēeō\\227\\200űß\\026t\\207mĐEI\\002F$ê\\200\\021éěám
ĀJñŮŮ\\200£\\036nr) s
1923: 5 622 M
1924: (y¿İCîß÷rĚap\\035\\013ùªn\\034Í\\213»í°Ů\\216\\217ăē\\216\\006eÔXî\\233Ů
¶Çi{©Eo4\\206°ŮŮj÷) s
1925: 5 610 M
1926: (HfOx\\214Ôâè\\220,Ê!\\)ëv\\000¤,{èèðzøùðzû\\212\\031\\206?]ú\\206\\001Ů}
Q\\025Ñ\\032\\216pdō) s
1927: 5 598 M
1928: (ç:\\236:Ůă\\206\\002WŷuƆhŷ\\001/\\201~\\200endstream) s
1929: 25.8 586 M (39:) s
1930: 52.2 586 M
1931: (endobj) s
1932: 25.8 574 M (40:) s
1933: 52.2 574 M
1934: (26 0 obj) s
1935: 25.8 562 M (41:) s
1936: 52.2 562 M
1937: (955) s
1938: 25.8 550 M (42:) s
1939: 52.2 550 M
1940: (endobj) s
1941: 25.8 538 M (43:) s
```



```
1942: 52.2 538 M
1943: (30 0 obj) s
1944: 25.8 526 M (44:) s
1945: 52.2 526 M
1946: (<</Length 31 0 R/Filter /FlateDecode>>) s
1947: 25.8 514 M (45:) s
1948: 52.2 514 M
1949: (stream) s
1950: 25.8 502 M (46:) s
1951: 52.2 502 M
1952: (x\234Å\230[oÛ6\024\200ßö+ÎC°8M(\221\224u\005) s
1953: 25.8 490 M (47:) s
1954: 52.2 490 M
1955: (lé\212®C\201µ\211±>$ÃªP´¬E•\222T\234üü\221²â°©¬İ\001\006û&\232
:>üîã¹\020) s
1956: 5 478 M
1957: (p) s
1958: 25.8 466 M (48:) s
1959: 52.2 466 M
1960: (Ø&\200Î³¿²Ör.\002È¤\205á\235å\206\030è\034\203çú\030\002¬¿
n]Z\036¬) s
1961: 5 454 M
1962: (-îGp±\221 \212j¼\000÷ãbw\232\220oÓ\233±\037nE6Ã\225Ö°Ñ
\2ë«E6ãpÅJ8_h¬) s
1963: 5 442 M
1964: (\020) s
1965: 24.8 442 M
1966: (\205ÅÖÛ\220\022ö"îûs\002\201$SKk\206=\207èwt²øÇBØö½\ö}@204Ů! ,
RkF\202\230,±ë) s
1967: 5 430 M
1968: (\232ûo\027Ö'k\036=B\006úmlîîÛ•~\00444ªv) s
1969: 255.8 430 M
1970: (HhîÃPë\210î) s
1971: 5 430 M
1972: (\0031Ê\215\Û) s
1973: 77.6 430 M
1974: (ú6&4ÔÂ\006Ã; \233»Z\231\233Û\210\206\236\035\020) s
1975: 5 430 M
1976: (Íí \023Yñç"Ñ°\026Ej³|±\213:ëİ!8°]\032vjµø\021+\033Ip\204Ö¥ó\213
\224yV\225¼RÖ)) s
1977: 5 418 M
1978: (\222\233) s
1979: _R
1980: S
1981: %%Page: (18) 23
1982: %%BeginPageSetup
1983: _S
1984: 38 24 translate
1985: /pagenum 18 def
1986: /fname (hello-world.cpp.pdf) def
1987: /fdir (.) def
1988: /ftail (hello-world.cpp.pdf) def
1989: % User defined strings:
1990: /pagenumstr (18) def
1991: /moddatestr (05/15/19) def
1992: /pagecountstr (/24) def
1993: /modtimestr (17:13:33) def
1994: /user_header_p true def
```

```
1995: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
1996: /user_header_center_str () def
1997: /user_header_right_str () def
1998: /user_footer_p false def
1999: %%EndPageSetup
2000: column_borders
2001: do_header
2002: 5 694 M
2003: (Ÿ\\023\\202ê\\206WYáî"ŰZ\\215a¿\\213 \\001ŷŰ±0Äö\\034\\002³ji]ÍH|\\202|
\\214g??ó\\200ö\\226) s
2004: 5 682 M
2005: (Å U"T^eöÄ"\\223¿\\026¿[f+?X\\213WW3Ű+e+ÎneŸ) s
2006: 25.8 670 M (49:) s
2007: 52.2 670 M
2008: (Æ\\007\\177adŸ^6Op¹{Ÿæ½Ŏ\\223ŭñVÄë\\005Ä<\\216PšñSUGw@lê\\003Å$BØCÄ\\20
3MÖ'\\202) s
2009: 5 658 M
2010: (p\\000H?\\217¶ŰüG\\003\\232|È+e7\\017vÃE±\\027/èå\\177-+\\016\\215"\\03
1x;,ÇMF>îä³ŎS@\\031) s
2011: 5 646 M
2012: ( ?0 ĩIQèO~-Dç-) s
2013: 5 646 M
2014: (O\\223JåL\\017å*Ië5 e\\232'YUK=+\\021«\\213Z¼®ø\\035\\027\\200:Å\\210\\
006zg\\221Ű\\006\\035) s
2015: 5 634 M
2016: (ORŸ~³a==ŸF[ ]pHª\\207\\202#\\226È\\037Ű) s
2017: _R
2018: S
2019: %%Page: (19) 24
2020: %%BeginPageSetup
2021: _S
2022: 38 24 translate
2023: /pagenum 19 def
2024: /fname (hello-world.cpp.pdf) def
2025: /fdir (.) def
2026: /ftail (hello-world.cpp.pdf) def
2027: % User defined strings:
2028: /pagenumstr (19) def
2029: /moddatestr (05/15/19) def
2030: /pagecountstr (/24) def
2031: /modtimestr (17:13:33) def
2032: /user_header_p true def
2033: /user_header_left_str ($cmpps109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
2034: /user_header_center_str () def
2035: /user_header_right_str () def
2036: /user_footer_p false def
2037: %%EndPageSetup
2038: column_borders
2039: do_header
2040: 5 694 M
2041: ("P\\235\\002T\\224&¶vö]Íç\\236Ű¹K\\204fÊÄÄ\\016cîMö\\221}¶ë\\030Fw°l+|ö
°\\202/©HÖ\\177) s
2042: 5 682 M
2043: (\\013îTçC\\226_îŰÊ\\0044O\\201-\\022\\001¬®zu}2@}\\034w\\013c\\235\\22
4Ű\\205 ~\\9YJ) s
2044: 5 670 M
```

```
2045: (\\207%JŨ-\\223İæië0\\035\\222ëŮC\\222$ _wg\\221Yg•ô4°</\\206¶Jü27î\\20
2/¹à\\225\\216eUÃ) s
2046: 5 658 M
2047: (\\227-8çY^\\035\\017ð\\222Ēxŷ1Ĥ7&bŮöæn\\210\\231NÆ\\034\\2141ŷĒ\\205â÷t
9\\204îN\\206\\034¼) s
2048: 5 646 M
2049: (\\024y>\\031rôRdo*d\\037¿\\024Ů\\237) s
2050: _R
2051: S
2052: %%Page: (20) 25
2053: %%BeginPageSetup
2054: _S
2055: 38 24 translate
2056: /pagenum 20 def
2057: /fname (hello-world.cpp.pdf) def
2058: /fdirection (.) def
2059: /ftail (hello-world.cpp.pdf) def
2060: % User defined strings:
2061: /pagenumstr (20) def
2062: /moddatestr (05/15/19) def
2063: /pagecountstr (/24) def
2064: /modtimestr (17:13:33) def
2065: /user_header_p true def
2066: /user_header_left_str ($cmpls109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
2067: /user_header_center_str () def
2068: /user_header_right_str () def
2069: /user_footer_p false def
2070: %%EndPageSetup
2071: column_borders
2072: do_header
2073: 5 694 M
2074: (\\231\\214!¿-Ô!ŮàĐ°a\\027Í\\033¹•a\\036\\177k\\212$\\234İ\\023/<\\234Ŋd
¼/®\\234t²î\\024\\214) s
2075: 5 682 M
2076: (úx$Aèd) s
2077: 5 682 M
2078: (*\\030-öÃ Bé; \\222 îÍ)öŮ\\034\\202âx*aîb]~üt|x\\037ÀŸ\\
223H?ÂLÖtÂŊŷnŎy) s
2079: 5 670 M
2080: (®Êu Ů«Ō\\220\\027'k=âhj=\\202ŷÆó1ŷ\\206Â'k@âh\\233\\037- \\223u \\
210\\2161_è³?\\027) s
2081: 5 658 M
2082: (\\037k9\\026\\202Ē"çŷ%D.»<\\036\\002\\017\\017©\\020¹1\\212ääzö]§¤\\2
23u\\236h<Ê) s
2083: 25.8 646 M (50:) s
2084: 52.2 646 M
2085: (\\236\\210.Ô\\006îv'k=Ŋèq²\\203\\036â\\235-î\\020üLō¼\\'Íy»ÔŌr) s
2086: 402 646 M
2087: (ü\\220\\026tĒ\\037nêD¤) s
2088: 5 634 M
2089: (Ōİgg\\220Wªûø.öŮĒ\\032) s
2090: 25.8 622 M (51:) s
2091: 52.2 622 M
2092: (q\\237ŋ\\211®\\023ê\\202÷ü2ä\\225ü\\001^\\)ëŌ\\034Y\\037}°İ\\033ŷK±îp#ûd
ŷ\\013"\\031}) s
2093: 5 610 M
2094: (¿endstream) s
```

```
2095: 25.8 598 M (52:) s
2096: 52.2 598 M
2097: (endobj) s
2098: 25.8 586 M (53:) s
2099: 52.2 586 M
2100: (31 0 obj) s
2101: 25.8 574 M (54:) s
2102: 52.2 574 M
2103: (1024) s
2104: 25.8 562 M (55:) s
2105: 52.2 562 M
2106: (endobj) s
2107: 25.8 550 M (56:) s
2108: 52.2 550 M
2109: (35 0 obj) s
2110: 25.8 538 M (57:) s
2111: 52.2 538 M
2112: (<</Length 36 0 R/Filter /FlateDecode>>) s
2113: 25.8 526 M (58:) s
2114: 52.2 526 M
2115: (stream) s
2116: 25.8 514 M (59:) s
2117: 52.2 514 M
2118: (x\234Å\227j\223\2336\024\206iö+îEgb•\005$>\005Wé&ÿøvw\2328\23
6æ"\233\231) s
2119: 5 502 M
2120: (h\205lô\002"\222\210wûë+ÃPx2\230í&\02700) s
2121: 262.4 502 M
2122: (qûê9G:;ø#\227\000îP\2073~\220•J'«\021) s
2123: 5 490 M
2124: (\206_Q@lø!\206\(\210l$ø^\)\201P ) s
2125: 196.4 490 M
2126: (ö"ÿ\021~\006\233$ø1T\Jö;]\236v\023ð¹{hçôÃdhî~ê "¶è) s
2127: 5 478 M
2128: (#"Cûpâ\025\~\026\005âÃz\203\006R\002\221iÆqH \211lw\205\026
8ð\210=ôâúoä'7\216ô) s
2129: 5 466 M
2130: ($\216Á!¾Ka\235£\005I2\022dADÿÿy\215^£0=B&öÖù0»wnü\024|ÚI\235\02
0\020ê\206\224Z) s
2131: 5 454 M
2132: (\215ô\035\030ün¾3%\203aibâšÖ,\003ð\016w-. »û\2160#7!\026ò
w\223Pd'ÊR:{©ÊÛâ) s
2133: 5 442 M
2134: (Mâ\226rû»Cpâ\006>íe-ûw¾j4Ã©³~¼\237´.¶u%j£½\222ÿn\235;B\034Û\210z
[z'r\017^c8\037) s
2135: 5 430 M
2136: (bBÃ\036'\036\206\001$ÿ\230öP^Åû\0020#\221\237A[çbsÔ"•\001Û) s
2137: 381.2 430 M
2138: (%j.ÃHø°-[óJj³\022y; ) s
2139: 5 418 M
2140: (\233\222ÿ?ë\(|1fèts\231fw\213 î\226N\214ñÂûÃ\224gªÃ\036çüEú\2
12¿ue\006\2275lÛ) s
2141: 5 406 M
2142: (\232\233BöÖA ½c\215,Y\024µü\021îxîöY¶|¿p\035urWhÿ½\025L\216\
\202l£=î\214v[®¹+) s
2143: 5 394 M
2144: (öôã²UZØP$\\204~xwN©îÆ"\235\212Å53ª,»\226¹\030\013\003\235\215:Æ
SÔW\222â\227¹\035) s
```

2145: 5 382 M
2146: ("0fÓ\\227ÎÇM&Wp\\237Êiñÿr\\2049Äó1OfËä) s
2147: 25.8 370 M (60:) s
2148: 52.2 370 M
2149: (É|ÔÃ\\024ö_\\205ø7R\\2311f\\177>æðÛö¥0xÂ¾T±ç>1DÝ\\026\\024\\206
³¹M'\\223) s
2150: 5 358 M
2151: (¹5\\227u1:QÑ|ÄÖiÜ\\023¿\\034|é\\fÄóÁ?Rý:ø•E\\235Ëý\\233âßQöùª\\025\\235
ÎêÖ¾P\\202\\0311Ð) s
2152: 5 346 M
2153: (\\217\\221îw±è#¹}x.¿øü\\034\\003\\237~dÑh\\032|5<ß\\234\\001\\217æ«[4\\
236\\006ÿCÜßJ|ösäöÖ) s
2154: 5 334 M
2155: (.\\232L\\223_ËV\\237) s
2156: 5 334 M
2157: (ø|å\\213ÔG°mÅ¹\\222²\\031f\\236®\\7\\013WË\\234\\031ö\\003¾\\213\\030¾Y
N\\017tQ\\230\\212\\215) s
2158: 5 322 M
2159: (p7ëç\\022z%+Vûá\\030Eø\\004) s
2160: 25.8 310 M (61:) s
2161: 52.2 310 M
2162: (úÖ\\024¿\\211ò\\2230\\005g\\204\\216ADÿ\\037âöëC\\221^Ü\\223hløcaâ²,\\0
057¶X) s
2163: 481.2 310 M
2164: (¥¤Ê îÖM) s
2165: 5 298 M
2166: («°\\201) s
2167: 38 298 M
2168: (\\210»Â\\2006î~úa\\031":\\026\\006U\\201³\\201ó\\005"?\\033\\035÷âç\\21
7¾ ú\\207g'\\035) s
2169: 5 286 M
2170: (+ôî\\016ûÅrëöú?\\207~Ñ\\177r\\207æÄendstream) s
2171: 25.8 274 M (62:) s
2172: 52.2 274 M
2173: (endobj) s
2174: 25.8 262 M (63:) s
2175: 52.2 262 M
2176: (36 0 obj) s
2177: 25.8 250 M (64:) s
2178: 52.2 250 M
2179: (832) s
2180: 25.8 238 M (65:) s
2181: 52.2 238 M
2182: (endobj) s
2183: 25.8 226 M (66:) s
2184: 52.2 226 M
2185: (4 0 obj) s
2186: 25.8 214 M (67:) s
2187: 52.2 214 M
2188: (<</Type/Page/MediaBox [0 0 612 792]) s
2189: 25.8 202 M (68:) s
2190: 52.2 202 M
2191: (/Rotate 0/Parent 3 0 R) s
2192: 25.8 190 M (69:) s
2193: 52.2 190 M
2194: (/Resources<</ProcSet[/PDF /Text]) s
2195: 25.8 178 M (70:) s
2196: 52.2 178 M

```
2197: (/ExtGState 12 0 R) s
2198: 25.8 166 M (71:) s
2199: 52.2 166 M
2200: (/Font 13 0 R) s
2201: 25.8 154 M (72:) s
2202: 52.2 154 M
2203: (>>) s
2204: 25.8 142 M (73:) s
2205: 52.2 142 M
2206: (/Contents 5 0 R) s
2207: 25.8 130 M (74:) s
2208: 52.2 130 M
2209: (>>) s
2210: 25.8 118 M (75:) s
2211: 52.2 118 M
2212: (endobj) s
2213: 25.8 106 M (76:) s
2214: 52.2 106 M
2215: (14 0 obj) s
2216: 25.8 94 M (77:) s
2217: 52.2 94 M
2218: (<</Type/Page/MediaBox [0 0 612 792]) s
2219: 25.8 82 M (78:) s
2220: 52.2 82 M
2221: (/Rotate 0/Parent 3 0 R) s
2222: 25.8 70 M (79:) s
2223: 52.2 70 M
2224: (/Resources<</ProcSet[/PDF /Text]) s
2225: 25.8 58 M (80:) s
2226: 52.2 58 M
2227: (/ExtGState 17 0 R) s
2228: 25.8 46 M (81:) s
2229: 52.2 46 M
2230: (/Font 18 0 R) s
2231: 25.8 34 M (82:) s
2232: 52.2 34 M
2233: (>>) s
2234: 25.8 22 M (83:) s
2235: 52.2 22 M
2236: (/Contents 15 0 R) s
2237: 25.8 10 M (84:) s
2238: 52.2 10 M
2239: (>>) s
2240: _R
2241: S
2242: %%Page: (21) 26
2243: %%BeginPageSetup
2244: _S
2245: 38 24 translate
2246: /pagenum 21 def
2247: /fname (hello-world.cpp.pdf) def
2248: /fdir (.) def
2249: /ftail (hello-world.cpp.pdf) def
2250: % User defined strings:
2251: /pagenumstr (21) def
2252: /moddatestr (05/15/19) def
2253: /pagecountstr (/24) def
2254: /modtimestr (17:13:33) def
```

```
2255: /user_header_p true def
2256: /user_header_left_str ($cmpts109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
2257: /user_header_center_str () def
2258: /user_header_right_str () def
2259: /user_footer_p false def
2260: %%EndPageSetup
2261: column_borders
2262: do_header
2263: 25.8 694 M (85:) s
2264: 52.2 694 M
2265: (endobj) s
2266: 25.8 682 M (86:) s
2267: 52.2 682 M
2268: (19 0 obj) s
2269: 25.8 670 M (87:) s
2270: 52.2 670 M
2271: (<</Type/Page/MediaBox [0 0 612 792]) s
2272: 25.8 658 M (88:) s
2273: 52.2 658 M
2274: (/Rotate 0/Parent 3 0 R) s
2275: 25.8 646 M (89:) s
2276: 52.2 646 M
2277: (/Resources<</ProcSet[/PDF /Text]) s
2278: 25.8 634 M (90:) s
2279: 52.2 634 M
2280: (/ExtGState 22 0 R) s
2281: 25.8 622 M (91:) s
2282: 52.2 622 M
2283: (/Font 23 0 R) s
2284: 25.8 610 M (92:) s
2285: 52.2 610 M
2286: (>>) s
2287: 25.8 598 M (93:) s
2288: 52.2 598 M
2289: (/Contents 20 0 R) s
2290: 25.8 586 M (94:) s
2291: 52.2 586 M
2292: (>>) s
2293: 25.8 574 M (95:) s
2294: 52.2 574 M
2295: (endobj) s
2296: 25.8 562 M (96:) s
2297: 52.2 562 M
2298: (24 0 obj) s
2299: 25.8 550 M (97:) s
2300: 52.2 550 M
2301: (<</Type/Page/MediaBox [0 0 612 792]) s
2302: 25.8 538 M (98:) s
2303: 52.2 538 M
2304: (/Rotate 0/Parent 3 0 R) s
2305: 25.8 526 M (99:) s
2306: 52.2 526 M
2307: (/Resources<</ProcSet[/PDF /Text]) s
2308: 19.2 514 M (100:) s
2309: 52.2 514 M
2310: (/ExtGState 27 0 R) s
2311: 19.2 502 M (101:) s
```

```
2312: 52.2 502 M
2313: (/Font 28 0 R) s
2314: 19.2 490 M (102:) s
2315: 52.2 490 M
2316: (>>) s
2317: 19.2 478 M (103:) s
2318: 52.2 478 M
2319: (/Contents 25 0 R) s
2320: 19.2 466 M (104:) s
2321: 52.2 466 M
2322: (>>) s
2323: 19.2 454 M (105:) s
2324: 52.2 454 M
2325: (endobj) s
2326: 19.2 442 M (106:) s
2327: 52.2 442 M
2328: (29 0 obj) s
2329: 19.2 430 M (107:) s
2330: 52.2 430 M
2331: (<</Type/Page/MediaBox [0 0 612 792]) s
2332: 19.2 418 M (108:) s
2333: 52.2 418 M
2334: (/Rotate 0/Parent 3 0 R) s
2335: 19.2 406 M (109:) s
2336: 52.2 406 M
2337: (/Resources<</ProcSet[/PDF /Text]) s
2338: 19.2 394 M (110:) s
2339: 52.2 394 M
2340: (/ExtGState 32 0 R) s
2341: 19.2 382 M (111:) s
2342: 52.2 382 M
2343: (/Font 33 0 R) s
2344: 19.2 370 M (112:) s
2345: 52.2 370 M
2346: (>>) s
2347: 19.2 358 M (113:) s
2348: 52.2 358 M
2349: (/Contents 30 0 R) s
2350: 19.2 346 M (114:) s
2351: 52.2 346 M
2352: (>>) s
2353: 19.2 334 M (115:) s
2354: 52.2 334 M
2355: (endobj) s
2356: 19.2 322 M (116:) s
2357: 52.2 322 M
2358: (34 0 obj) s
2359: 19.2 310 M (117:) s
2360: 52.2 310 M
2361: (<</Type/Page/MediaBox [0 0 612 792]) s
2362: 19.2 298 M (118:) s
2363: 52.2 298 M
2364: (/Rotate 0/Parent 3 0 R) s
2365: 19.2 286 M (119:) s
2366: 52.2 286 M
2367: (/Resources<</ProcSet[/PDF /Text]) s
2368: 19.2 274 M (120:) s
2369: 52.2 274 M
```



```
2370: (/ExtGState 37 0 R) s
2371: 19.2 262 M (121:) s
2372: 52.2 262 M
2373: (/Font 38 0 R) s
2374: 19.2 250 M (122:) s
2375: 52.2 250 M
2376: (>>) s
2377: 19.2 238 M (123:) s
2378: 52.2 238 M
2379: (/Contents 35 0 R) s
2380: 19.2 226 M (124:) s
2381: 52.2 226 M
2382: (>>) s
2383: 19.2 214 M (125:) s
2384: 52.2 214 M
2385: (endobj) s
2386: 19.2 202 M (126:) s
2387: 52.2 202 M
2388: (3 0 obj) s
2389: 19.2 190 M (127:) s
2390: 52.2 190 M
2391: (<< /Type /Pages /Kids []) s
2392: 19.2 178 M (128:) s
2393: 52.2 178 M
2394: (4 0 R) s
2395: 19.2 166 M (129:) s
2396: 52.2 166 M
2397: (14 0 R) s
2398: 19.2 154 M (130:) s
2399: 52.2 154 M
2400: (19 0 R) s
2401: 19.2 142 M (131:) s
2402: 52.2 142 M
2403: (24 0 R) s
2404: 19.2 130 M (132:) s
2405: 52.2 130 M
2406: (29 0 R) s
2407: 19.2 118 M (133:) s
2408: 52.2 118 M
2409: (34 0 R) s
2410: 19.2 106 M (134:) s
2411: 52.2 106 M
2412: (] /Count 6) s
2413: 19.2 94 M (135:) s
2414: 52.2 94 M
2415: (>>) s
2416: 19.2 82 M (136:) s
2417: 52.2 82 M
2418: (endobj) s
2419: 19.2 70 M (137:) s
2420: 52.2 70 M
2421: (1 0 obj) s
2422: 19.2 58 M (138:) s
2423: 52.2 58 M
2424: (<</Type /Catalog /Pages 3 0 R) s
2425: 19.2 46 M (139:) s
2426: 52.2 46 M
2427: (/Metadata 39 0 R) s
```

```
2428: 19.2 34 M (140:) s
2429: 52.2 34 M
2430: (>>) s
2431: 19.2 22 M (141:) s
2432: 52.2 22 M
2433: (endobj) s
2434: 19.2 10 M (142:) s
2435: 52.2 10 M
2436: (7 0 obj) s
2437: _R
2438: S
2439: %%Page: (22) 27
2440: %%BeginPageSetup
2441: _S
2442: 38 24 translate
2443: /pagemum 22 def
2444: /fname (hello-world.cpp.pdf) def
2445: /fdire (.) def
2446: /ftail (hello-world.cpp.pdf) def
2447: % User defined strings:
2448: /pagemumstr (22) def
2449: /moddatestr (05/15/19) def
2450: /pagecountstr (/24) def
2451: /modtimestr (17:13:33) def
2452: /user_header_p true def
2453: /user_header_left_str ($cmpts109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
2454: /user_header_center_str () def
2455: /user_header_right_str () def
2456: /user_footer_p false def
2457: %%EndPageSetup
2458: column_borders
2459: do_header
2460: 19.2 694 M (143:) s
2461: 52.2 694 M
2462: (<</Type/ExtGState) s
2463: 19.2 682 M (144:) s
2464: 52.2 682 M
2465: (/OPM 1>>endobj) s
2466: 19.2 670 M (145:) s
2467: 52.2 670 M
2468: (12 0 obj) s
2469: 19.2 658 M (146:) s
2470: 52.2 658 M
2471: (<</R7) s
2472: 19.2 646 M (147:) s
2473: 52.2 646 M
2474: (7 0 R>>) s
2475: 19.2 634 M (148:) s
2476: 52.2 634 M
2477: (endobj) s
2478: 19.2 622 M (149:) s
2479: 52.2 622 M
2480: (13 0 obj) s
2481: 19.2 610 M (150:) s
2482: 52.2 610 M
2483: (<</R8) s
2484: 19.2 598 M (151:) s
```

```
2485: 52.2 598 M
2486: (8 0 R/R10) s
2487: 19.2 586 M (152:) s
2488: 52.2 586 M
2489: (10 0 R/R9) s
2490: 19.2 574 M (153:) s
2491: 52.2 574 M
2492: (9 0 R/R11) s
2493: 19.2 562 M (154:) s
2494: 52.2 562 M
2495: (11 0 R>>) s
2496: 19.2 550 M (155:) s
2497: 52.2 550 M
2498: (endobj) s
2499: 19.2 538 M (156:) s
2500: 52.2 538 M
2501: (17 0 obj) s
2502: 19.2 526 M (157:) s
2503: 52.2 526 M
2504: (<</R7) s
2505: 19.2 514 M (158:) s
2506: 52.2 514 M
2507: (7 0 R>>) s
2508: 19.2 502 M (159:) s
2509: 52.2 502 M
2510: (endobj) s
2511: 19.2 490 M (160:) s
2512: 52.2 490 M
2513: (18 0 obj) s
2514: 19.2 478 M (161:) s
2515: 52.2 478 M
2516: (<</R8) s
2517: 19.2 466 M (162:) s
2518: 52.2 466 M
2519: (8 0 R/R10) s
2520: 19.2 454 M (163:) s
2521: 52.2 454 M
2522: (10 0 R/R9) s
2523: 19.2 442 M (164:) s
2524: 52.2 442 M
2525: (9 0 R/R11) s
2526: 19.2 430 M (165:) s
2527: 52.2 430 M
2528: (11 0 R>>) s
2529: 19.2 418 M (166:) s
2530: 52.2 418 M
2531: (endobj) s
2532: 19.2 406 M (167:) s
2533: 52.2 406 M
2534: (22 0 obj) s
2535: 19.2 394 M (168:) s
2536: 52.2 394 M
2537: (<</R7) s
2538: 19.2 382 M (169:) s
2539: 52.2 382 M
2540: (7 0 R>>) s
2541: 19.2 370 M (170:) s
2542: 52.2 370 M
```

```
2543: (endobj) s
2544: 19.2 358 M (171:) s
2545: 52.2 358 M
2546: (23 0 obj) s
2547: 19.2 346 M (172:) s
2548: 52.2 346 M
2549: (<</R8) s
2550: 19.2 334 M (173:) s
2551: 52.2 334 M
2552: (8 0 R/R10) s
2553: 19.2 322 M (174:) s
2554: 52.2 322 M
2555: (10 0 R/R9) s
2556: 19.2 310 M (175:) s
2557: 52.2 310 M
2558: (9 0 R/R11) s
2559: 19.2 298 M (176:) s
2560: 52.2 298 M
2561: (11 0 R>>) s
2562: 19.2 286 M (177:) s
2563: 52.2 286 M
2564: (endobj) s
2565: 19.2 274 M (178:) s
2566: 52.2 274 M
2567: (27 0 obj) s
2568: 19.2 262 M (179:) s
2569: 52.2 262 M
2570: (<</R7) s
2571: 19.2 250 M (180:) s
2572: 52.2 250 M
2573: (7 0 R>>) s
2574: 19.2 238 M (181:) s
2575: 52.2 238 M
2576: (endobj) s
2577: 19.2 226 M (182:) s
2578: 52.2 226 M
2579: (28 0 obj) s
2580: 19.2 214 M (183:) s
2581: 52.2 214 M
2582: (<</R8) s
2583: 19.2 202 M (184:) s
2584: 52.2 202 M
2585: (8 0 R/R10) s
2586: 19.2 190 M (185:) s
2587: 52.2 190 M
2588: (10 0 R/R9) s
2589: 19.2 178 M (186:) s
2590: 52.2 178 M
2591: (9 0 R/R11) s
2592: 19.2 166 M (187:) s
2593: 52.2 166 M
2594: (11 0 R>>) s
2595: 19.2 154 M (188:) s
2596: 52.2 154 M
2597: (endobj) s
2598: 19.2 142 M (189:) s
2599: 52.2 142 M
2600: (32 0 obj) s
```

```
2601: 19.2 130 M (190:) s
2602: 52.2 130 M
2603: (<</R7) s
2604: 19.2 118 M (191:) s
2605: 52.2 118 M
2606: (7 0 R>>) s
2607: 19.2 106 M (192:) s
2608: 52.2 106 M
2609: (endobj) s
2610: 19.2 94 M (193:) s
2611: 52.2 94 M
2612: (33 0 obj) s
2613: 19.2 82 M (194:) s
2614: 52.2 82 M
2615: (<</R8) s
2616: 19.2 70 M (195:) s
2617: 52.2 70 M
2618: (8 0 R/R10) s
2619: 19.2 58 M (196:) s
2620: 52.2 58 M
2621: (10 0 R/R9) s
2622: 19.2 46 M (197:) s
2623: 52.2 46 M
2624: (9 0 R/R11) s
2625: 19.2 34 M (198:) s
2626: 52.2 34 M
2627: (11 0 R>>) s
2628: 19.2 22 M (199:) s
2629: 52.2 22 M
2630: (endobj) s
2631: 19.2 10 M (200:) s
2632: 52.2 10 M
2633: (37 0 obj) s
2634: _R
2635: S
2636: %%Page: (23) 28
2637: %%BeginPageSetup
2638: _S
2639: 38 24 translate
2640: /pagenum 23 def
2641: /fname (hello-world.cpp.pdf) def
2642: /fdire (.) def
2643: /ftail (hello-world.cpp.pdf) def
2644: % User defined strings:
2645: /pagenumstr (23) def
2646: /moddatestr (05/15/19) def
2647: /pagecountstr (/24) def
2648: /modtimestr (17:13:33) def
2649: /user_header_p true def
2650: /user_header_left_str ($cmpts109-wm/Assignments/labg-x11-opengl/hello-wor
ld) def
2651: /user_header_center_str () def
2652: /user_header_right_str () def
2653: /user_footer_p false def
2654: %%EndPageSetup
2655: column_borders
2656: do_header
2657: 19.2 694 M (201:) s
```

```
2658: 52.2 694 M
2659: (<</R7) s
2660: 19.2 682 M (202:) s
2661: 52.2 682 M
2662: (7 0 R>>) s
2663: 19.2 670 M (203:) s
2664: 52.2 670 M
2665: (endobj) s
2666: 19.2 658 M (204:) s
2667: 52.2 658 M
2668: (38 0 obj) s
2669: 19.2 646 M (205:) s
2670: 52.2 646 M
2671: (<</R8) s
2672: 19.2 634 M (206:) s
2673: 52.2 634 M
2674: (8 0 R/R10) s
2675: 19.2 622 M (207:) s
2676: 52.2 622 M
2677: (10 0 R/R9) s
2678: 19.2 610 M (208:) s
2679: 52.2 610 M
2680: (9 0 R/R11) s
2681: 19.2 598 M (209:) s
2682: 52.2 598 M
2683: (11 0 R>>) s
2684: 19.2 586 M (210:) s
2685: 52.2 586 M
2686: (endobj) s
2687: 19.2 574 M (211:) s
2688: 52.2 574 M
2689: (8 0 obj) s
2690: 19.2 562 M (212:) s
2691: 52.2 562 M
2692: (<</BaseFont/Times-Bold/Type/Font) s
2693: 19.2 550 M (213:) s
2694: 52.2 550 M
2695: (/Subtype/Type1>>) s
2696: 19.2 538 M (214:) s
2697: 52.2 538 M
2698: (endobj) s
2699: 19.2 526 M (215:) s
2700: 52.2 526 M
2701: (10 0 obj) s
2702: 19.2 514 M (216:) s
2703: 52.2 514 M
2704: (<</BaseFont/Times-Roman/Type/Font) s
2705: 19.2 502 M (217:) s
2706: 52.2 502 M
2707: (/Subtype/Type1>>) s
2708: 19.2 490 M (218:) s
2709: 52.2 490 M
2710: (endobj) s
2711: 19.2 478 M (219:) s
2712: 52.2 478 M
2713: (9 0 obj) s
2714: 19.2 466 M (220:) s
2715: 52.2 466 M
```

```
2716: (<</BaseFont/Helvetica-Bold/Type/Font) s
2717: 19.2 454 M (221:) s
2718: 52.2 454 M
2719: (/Subtype/Type1>>) s
2720: 19.2 442 M (222:) s
2721: 52.2 442 M
2722: (endobj) s
2723: 19.2 430 M (223:) s
2724: 52.2 430 M
2725: (11 0 obj) s
2726: 19.2 418 M (224:) s
2727: 52.2 418 M
2728: (<</BaseFont/Courier-Bold/Type/Font) s
2729: 19.2 406 M (225:) s
2730: 52.2 406 M
2731: (/Subtype/Type1>>) s
2732: 19.2 394 M (226:) s
2733: 52.2 394 M
2734: (endobj) s
2735: 19.2 382 M (227:) s
2736: 52.2 382 M
2737: (39 0 obj) s
2738: 19.2 370 M (228:) s
2739: 52.2 370 M
2740: (<</Type/Metadata) s
2741: 19.2 358 M (229:) s
2742: 52.2 358 M
2743: (/Subtype/XML/Length 1430>>stream) s
2744: 19.2 346 M (230:) s
2745: 52.2 346 M
2746: (<?xpacket begin='ï»¿' id='W5M0MpCehiHzreSzNTczkc9d'?) s
2747: 19.2 334 M (231:) s
2748: 52.2 334 M
2749: (<?adobe-xap-filters esc="CRLF"?>) s
2750: 19.2 322 M (232:) s
2751: 52.2 322 M
2752: (<x:xmpmeta xmlns:x='adobe:ns:meta/' x:xmptk='XMP toolkit 2.9.1-13, fram
e) s
2753: 5 310 M
2754: (work 1.6'>) s
2755: 19.2 298 M (233:) s
2756: 52.2 298 M
2757: (<rdf:RDF xmlns:rdf='http://www.w3.org/1999/02/22-rdf-syntax-ns#' xmlns:
i) s
2758: 5 286 M
2759: (X='http://ns.adobe.com/iX/1.0/'>) s
2760: 19.2 274 M (234:) s
2761: 52.2 274 M
2762: (<rdf:Description rdf:about='uuid:fd9d2e88-af8b-11f4-0000-be943387ce8c'
x) s
2763: 5 262 M
2764: (mlns:pdf='http://ns.adobe.com/pdf/1.3/' pdf:Producer='GPL Ghostscript 9
.07'/>) s
2765: 19.2 250 M (235:) s
2766: 52.2 250 M
2767: (<rdf:Description rdf:about='uuid:fd9d2e88-af8b-11f4-0000-be943387ce8c'
x) s
2768: 5 238 M
```

```
2769: (xmlns:xmp='http://ns.adobe.com/xap/1.0/'><xmp:ModifyDate>2019-05-15T17:1
3:33-07:) s
2770: 5 226 M
2771: (00</xmp:ModifyDate>) s
2772: 19.2 214 M (236:) s
2773: 52.2 214 M
2774: (<xmp:CreateDate>2019-05-15T17:13:33-07:00</xmp:CreateDate>) s
2775: 19.2 202 M (237:) s
2776: 52.2 202 M
2777: (<xmp:CreatorTool>GNU Enscript 1.6.6</xmp:CreatorTool></rdf:Description>
) s
2778: 19.2 190 M (238:) s
2779: 52.2 190 M
2780: (<rdf:Description rdf:about='uuid:fd9d2e88-af8b-11f4-0000-be943387ce8c'
x) s
2781: 5 178 M
2782: (xmlns:xapMM='http://ns.adobe.com/xap/1.0/mm/' xapMM:DocumentID='uuid:fd9
d2e88-af) s
2783: 5 166 M
2784: (8b-11f4-0000-be943387ce8c'/>) s
2785: 19.2 154 M (239:) s
2786: 52.2 154 M
2787: (<rdf:Description rdf:about='uuid:fd9d2e88-af8b-11f4-0000-be943387ce8c'
x) s
2788: 5 142 M
2789: (xmlns:dc='http://purl.org/dc/elements/1.1/' dc:format='application/pdf'>
<dc:titl) s
2790: 5 130 M
2791: (e><rdf:Alt><rdf:li xml:lang='x-default'>./hello-world.cpp.ps</rdf:li></
rdf:Alt>) s
2792: 5 118 M
2793: (</dc:title><dc:creator><rdf:Seq><rdf:li>Wesley Mackey</rdf:li></rdf:Seq
></dc:cr) s
2794: 5 106 M
2795: (eator></rdf:Description>) s
2796: 19.2 94 M (240:) s
2797: 52.2 94 M
2798: (</rdf:
```