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1 /*****
2  * PROGRAMMER : Ali Eshghi
3  * STUDENT ID : 1112261
4  * CLASS      : CS1C
5  * SECTION    : MW 5pm
6  * Assign #7  : Exception
7  * DUE DATE   : 23 March 2020
8  *****/
9
10 #include "MyHeader.h"
11
12 int main(int argc, char *argv[])
13 {
14     /*****
15      * Perimeter and Area of shapes comparing using
16      * overloading frined functions and class methods
17      *
18      * This program prompts the user to input information for a
19      * shape of square and a shape of triangle. then using the
20      * virtual methods and inheritance of the classes, calculates
21      * the perimeter and area of those shapes, then using the
22      * frined class functions and class methods, the program
23      * compares the area and perimeter of the squares with the
24      * area and perimeter of the triangle. then outputs if any
25      * attributes of these shapes were equal, then again promts the
26      * user how many units they want to increase the length of both
27      * shapes and again print outs the attribute of the shapes
28      *
29      *Also, using the try/catch blocks, the program determines if the
30      *input numbers by the user are correct or no.
31      *
32      * INPUT: square length, triangle sides
33      *
34      * OUTPUT: prints out the perimeter and area of the both shapes
35      *          based on the information that the user put in, the
36      *          result of the comparison of the attributes, and the
37      *          new attributes after the modification
38      *
39      *****/
40
41
42     cout << "/*****\n"
43         << " * Perimeter and Area of shapes comparing using\n"
44         << " * overloading frined functions and class methods\n"
45         << " * _____\n"
46         << " * This program prompts the user to input information for a\n"
47         << " * shape of square and a shape of triangle. then using the\n"
48         << " * virtual methods and inheritance of the classes, calculates\n"
49         << " * the perimeter and area of those shapes, then using the\n"
50         << " * frined class functions and class methods, the program\n"
51         << " * compares the area and perimeter of the squares with the\n"
52         << " * area and perimeter of the triangle. then outputs if any\n"
53         << " * attributes of these shapes were equal, then again promts the\n"
54         << " * user how many units they want to increase the length of both\n"
55         << " * shapes and again print outs the attribute of the shapes\n"
56         << " *\n"
57         << " * _____\n"
58         << " * INPUT: square length, triangle sides\n"
59         << " *\n"

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60     << "* OUTPUT: prints out the perimeter and area of the both shapes\n"
61     << "*         based on the information that the user put in, the\n"
62     << "*         result of the comparison of the attributes, and the\n"
63     << "*         new attributes after the modification\n"
64     << "*\n"
65     << "*****\n\n";
66
67
68 // check if 3 arguments are provided are not
69 // argv[0] is program name
70 // argv[1] is first name, argv[2] is last name
71 if(argc < 3)
72 {
73     cout<<"Arguments not provided correctly\n";
74     return 1;
75 }
76
77
78 // display first and last name
79 cout<<"First Name : "<<argv[1];
80 cout<<"\nLast Name : "<<argv[2];
81
82
83 // display second characters
84 // since argv[] is a char array we can directly access it's second char by [1] index
85 cout<<"\nSecond Character of First Name : "<<argv[1][1];
86 cout<<"\nSecond Character of Last Name : "<<argv[2][1];
87 // PART B ends
88
89 // input 3 squares and triangles for sample testing
90 float length,side1,side2,side3;
91
92 //begin try block
93 try
94 {
95     cout << "\n\nTRY BLOCK #1: ";
96
97     cout<<"\n\nEnter the length of 1st Square:";
98     cin>>length;
99
100     throw length;
101 }
102
103 catch(float length)
104 {
105     cout << "\n\nCATCHBLOCK #1: ";
106
107     while(length < 0 || length > 50)
108     {
109
110
111         if(length < 0)
112         {
113             cout << "\nThe side length: " << length
114                 << " is too small.\nPlease enter a value greater than 0.\n\n";
115         }
116
117         else if(length > 50)
118         {

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119         cout << "\nThe side length: " << length
120             << " is too big.\nPlease enter a value smaller than 50.\n\n";
121     }
122
123     cout<<"\n\nEnter the length of 1st Square:";
124     cin>>length;
125     cin.ignore(10000, '\n');
126 }
127
128 }
129
130 cout << "\n<<Valid side length input>>\n\n";
131
132 Square r1(length);
133 r1.printPerimeter();
134 r1.printArea();
135 cout<<"Enter the three sides of 1st triangle:";
136 cin>>side1>>side2>>side3;
137 Triangle s1(side1,side2,side3);
138 s1.printPerimeter();
139 s1.printArea();
140
141
142 //begin try block
143 try
144 {
145     cout << "\n\nTRY BLOCK #2: ";
146
147     cout<<"\n\nEnter the length and width of 2nd square:";
148     cin>>length;
149
150     throw length;
151 }
152
153 catch(float length)
154 {
155     cout << "\n\nCATCHBLOCK #1: ";
156
157     while(length < 0 || length > 50)
158     {
159
160
161         if(length < 0)
162         {
163             cout << "\nThe side length: " << length
164                 << " is too small.\nPlease enter a value greater than 0.\n\n";
165         }
166
167         else if(length > 50)
168         {
169             cout << "\nThe side length: " << length
170                 << " is too big.\nPlease enter a value smaller than 50.\n\n";
171         }
172
173         cout<<"\n\nEnter the length of 2nd Square:";
174         cin>>length;
175         cin.ignore(10000, '\n');
176     }
177 }

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178
179 cout << "\n<<Valid side length input>>\n\n";
180
181 Square r2(length);
182 r2.printPerimeter();
183 r2.printArea();
184 cout<<"Enter the three sides of 2nd triangle:";
185 cin>>side1>>side2>>side3;
186 Triangle s2(side1,side2,side3);
187 s2.printPerimeter();
188 s2.printArea();
189
190 //begin try block
191 try
192 {
193     cout << "\n\nTRY BLOCK #3: ";
194
195     cout<<"\n\nEnter the length of 3rd square:";
196     cin>>length;
197
198     throw length;
199 }
200
201 catch(float length)
202 {
203     cout << "\n\nCATCHBLOCK #3: ";
204
205     while(length < 0 || length > 50)
206     {
207
208         if(length < 0)
209         {
210             cout << "\nThe side length: " << length
211                 << " is too small.\nPlease enter a value greater than 0.\n\n";
212         }
213
214         else if(length > 50)
215         {
216             cout << "\nThe side length: " << length
217                 << " is too big.\nPlease enter a value smaller than 50.\n\n";
218         }
219
220         cout<<"\n\nEnter the length of 3rd square:";
221         cin>>length;
222         cin.ignore(10000, '\n');
223     }
224 }
225 }
226
227 Square r3(length);
228 r3.printPerimeter();
229 r3.printArea();
230 cout<<"Enter the three sides of 3rd triangle:";
231 cin>>side1>>side2>>side3;
232 Triangle s3(side1,side2,side3);
233 s3.printPerimeter();
234 s3.printArea();
235
236

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```

237 // Testing for equal perimeters
238 cout<<"\nSquare 1 and Triangle 1 Perimeter Check : ";
239 if(equalPer(r1, s1))
240 {
241 cout<<"Equal\n";
242 }
243 else
244 cout<<"Unequal\n";
245
246 cout<<"\nSquare 2 and Triangle 2 Perimeter Check : ";
247 if(equalPer(r2, s2))
248 {
249 cout<<"Equal\n";
250 }
251 else
252 cout<<"Unequal\n";
253
254
255 // Testing rectangles for equal area
256 cout<<"\nSquare 1 and Rectangle 2 Area Check : ";
257 if(r1 == r2)
258 {
259 cout<<"Equal\n";
260 }
261 else
262 cout<<"Unequal\n";
263
264 cout<<"\nSquare 2 and Rectangle 3 Area Check : ";
265 if(r2 == r3)
266 {
267 cout<<"Equal\n";
268 }
269 else
270 cout<<"Unequal\n";
271
272
273 // testing addition member function
274 int x;
275 cout<<"\nIncrease length of Square 1 by how much : ";
276 cin>>x;
277 r1.addition(x);
278
279
280 // testing overloaded + operator
281 cout<<"\nAfter doing r2 = r2 + 8 :\n";
282 r2 = r2 + 8;
283
284
285 // testing >> overloaded operator
286 cout<<"\nAfter doing cin>>r3 :\n";
287 cin>>r3;
288
289 // testing << overloaded operator
290 cout<<"\nAfter doing cout<<r3 :\n";
291 cout<<r3;
292
293 return 0;
294 }
295

```

main.cpp

296
297
298