CMPS 401
Survey of Programming Languages

Programming Assignment #5
JavaScript language
On the Ubuntu Operating System

Write an html file (P5.html) that uses JavaScript program to create a Blackjack game.

1. Blackjack Games Rules:
   a. The object of the game is to "beat the dealer", which can be done in a number of ways:
      - Get 21 points on your first two cards (called a blackjack), without a dealer blackjack;
      - Reach a final score higher than the dealer without exceeding 21; or
      - Let the dealer draw additional cards until his hand exceeds 21.
   b. The player is dealt an initial two-card hand and add together the value of their cards.
   c. The dealer (not the player) has to take hits until cards total 17 or more points.
   d. Values: Jack, Queen and King is 10, Ace is either 1 or 11, and all other cards have the value of their number.
   e. The order does **not** matter. For examples, get 13 points on "A + 2 + K " and "K + 2 + A" .

2. You need a CMPS401 account on the Ubuntu Operating System.
3. If you need help with this assignment, go to the following links:
   - JavaScript Tutorial (w3schools)
   - JavaScript Tutorial (echoecho.com)
   - Blackjack wiki (wikipedia.org)

4. Internet Explorer will be the browser used to test your program.
5. Download and extract "cards.zip" into your folder you will have your program
6. There are 6 examples to assist you on this assignment.
   1) A simple program to run (TSimple.html)
   2) Test data types and variables (TVar.html)
   3) Test selection statements (TSel.html)
   4) Test loops (TLoop.html)
   5) Test subprograms (TSub.html)
   6) Other concerns: Test Random (TRandom.html)

7. Your program assignment #5 consists of the following file under "**public_html**" folder of your CMPS401 account:
   1) HTML file with JavaScript (P5.html)

   Note: Your files on the Ubuntu Operating System will be checked and should not be modified after due date.

Examples

A Simple Program to Run (TSimple.html)

```
<html>
   <head>
      <title>JavaScript Test Simple</title>
   </head>
   <body>
      <script type="text/javascript">
         // Display "Hello" on your screen
         // Program-ID: TSimple.html
         // Author:     Kuo-pao Yang
         document.write("Hello");
         /* Output:
            Hello
         */
      </script>
   </body>
</html>
```

Data Types and Variables (TVar.html)

```
<html>
   <head>
      <title>JavaScript Test Variables</title>
   </head>
   <body>
      <script type="text/javascript">
         // Test variables: JavaScript ALL local variables "var"
         // Program-ID: TVar.html
         // Author:     Kuo-pao Yang
         var i1 = 1,    i2 = 2;
         var f1 = 3.3,  f2 = 4.4;
         var c  = 'a',  s  ="bcd";
         f1 = i1;
         i2 = f2;
         c  = c + s + " " + "efg";
         s  = i1;
         document.write("i1 = " + i1 + "<br/>");
         document.write("i2 = " + i2 + "<br/>");
         document.write("f1 = " + f1 + "<br/>");
         document.write("f2 = " + f2 + "<br/>");
         document.write("c  = " + c  + "<br/>");
         document.write("s  = " + s  + "<br/>");
         /* Output:
            i1 = 1
            i2 = 4.4
            f1 = 1
            f2 = 4.4
            c = abcd efg
            s = 1
         */
      </script>
   </body>
</html>
```

Selection Statements (TSel.html)

```
<html>
   <head>
      <title>JavaScript Test Selections</title>
   </head>
   <body>
      <script type="text/javascript">
         // Test Selections:      if, if-else, nested if-else
         // Logical Operators:    &&, ||, !
         // Relational Operators: <, >, ==, <=, >=, !=
         // Program-ID: TSel.html
         // Author:     Kuo-pao Yang
         var i1=1, i2=2, i3=3, i4=4, i5=5, i6=6;

         // Test a simple if
         if (i4 > i1) document.write( "i4 > i1 <br/>");

         // Test if-else
         if ((i5 < i2) && (i3 >= i2))
            document.write("(i5 <  i2) && (i3 >= i2) <br/>");
         else
            document.write("(i5 >= i2) || (i3 <  i2) <br/>");

         // Test nested if-else
         if (i1 != i2) {
            document.write("(i1 != i2) <br/>");
         }
         else {
            if ((i4 == i5) || (i5 != i6)) {
               document.write("(i1 == i2)&& ((i4 == i5) || (i5 != i6)) <br/>");
            }
         }

         /* Output:
            i4 > i1
            (i5 >= i2) || (i3 < i2)
            (i1 != i2)
         */
      </script>
   </body>
</html>
```

Loops (TLoop.html)

```
<html>
   <head>
      <title>JavaScript Test Loops</title>
   </head>
   <body>
      <script type="text/javascript">
         // Test Loops: while, for, nested loops (1-D and 2-D Arrays)
         // Program-ID: TLoop.html
         // Author:     Kuo-pao Yang

         var a = new Array(1, 2, 3);
         var b = new Array(new Array(10, 20, 30),
                           new Array(40, 50, 60),
                           new Array(70, 80, 90));

         document.write("<br>Test while loop: 1-D Arrary<br/>");
         var i = 0;
         while(i < 3) {
            document.write("a["+i+"]=" + a[i] + " ");
            i++;
         }

         document.write("<br>Test for loop: 2-D Arrary<br/>");
         for(j = 0; j < 3; j++) {
            document.write("b[1,"+j+"]=" + b[1][j] + " ");
         }

         document.write("<br>Test nested loop: 2-D Arrary");
         for(i = 0; i < 3; i++) {
            document.write("<br/>");
            for(j = 0; j < 3; j++) {
               document.write("b["+i+","+j+"]=" + b[i][j] + " ");
            }
         }

         /* Output:
            Test while loop: 1-D Arrary
            a[0]=1 a[1]=2 a[2]=3
            Test for loop: 2-D Arrary
            b[1,0]=40 b[1,1]=50 b[1,2]=60
            Test nested loop: 2-D Arrary
            b[0,0]=10 b[0,1]=20 b[0,2]=30
            b[1,0]=40 b[1,1]=50 b[1,2]=60
            b[2,0]=70 b[2,1]=80 b[2,2]=90
         */
      </script>
   </body>
</html>
```

Subprograms (TSub.html)

```
<html>
   <head>
      <title>JavaScript Test Subprograms</title>
   </head>
   <body>
      <script type="text/javascript">
         // Test Subprograms
         // Program-ID: TSub.html
         // Author:     Kuo-pao Yang

         //Test call by value
         document.write("Test Call by Value<br/>");
         var m = 1;
         func1(m);
         document.write("m = " + m + "<br/>");
         var n = func2(m);
         document.write("n = " + n + "<br/>");

         //Test Array to Subprograms
         document.write("Test Array to Subprograms<br/>");
         var a = new Array(10, 20, 30);
         func3(a[1], a);
         for(var i = 0; i < 3; i++) {
            document.write("a["+i+"] = " + a[i] + " ");
         }
         document.write("<br/>");
         b = func4(a[1], a);
         for(var i = 0; i < 3; i++) {
            document.write("b["+i+"] = " + b[i] + " ");
         }

         function func1(i) {
            i = i + 1;
         }
         function func2(i) {
            i = i + 2;
            return i;
        }
         function func3(i, j) {
            i = i + 3; j[0] = j[0] + 4;
         }
         function func4(i, j) {
            i = i + 3; j[0] = j[0] + 4;
            return j;
         }

         /* Output:
            Test Call by Value
            m = 1
            n = 3
            Test Array to Subprograms
            a[0] = 14 a[1] = 20 a[2] = 30
            b[0] = 18 b[1] = 20 b[2] = 30
         */
      </script>
   </body>
</html>
```

Other concerns: Test Random (TRandom.html)

```
<html>
   <head>
      <title>JavaScript Test Random</title>
   </head>
   <body >
      <script language = "javascript">
         // Guess a number 0-9
         // Program-ID: TRandom.html
         // Author:     Kuo-pao Yang
         var num = Math.floor(Math.random()*10);
         function guessNum() {
            var guess = document.forms["guessForm"]["num"].value;
            if (guess == num)
                   window.alert("Correct! num = " + num);
            else if (guess < num)
                   window.alert("Your guess is too low! num = " + num);
            else   window.alert("Your guess is too high! num = " + num);
         }
      </script>
      <form name="guessForm">
         Enter a guess number (0-9): <br/>
         <input type="text" name="num"><br/>
         <button onClick="guessNum()"> Guess </button>
      </form>
   </body>
</html>
```