



The 7th Annual Newport News Computer Challenge

Wednesday, March 5, 2008

Team Packet

Visual Basic Problems



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Coffee or Tea ~ 10 points



Some Like It Hot! ~ 10 points



Slot Machine ~ 20 points



Make A Face ~ 30 points



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Coffee Or Tea (10 points)



Create a project with a single form.

On the form, place a command button. When the command button is clicked, invoke a common dialog box to change the background color of the form. When the background color of the form changes, the background color of the buttons should not change. If the user cancels, no color change should occur.

Also on the form, create an additional command button which, when clicked, displays an Input Box that will ask the user if they would prefer coffee or tea. Set a default value of "Coffee", and position the Input Box in the upper left hand corner of the screen.

If the user responds correctly with either coffee or tea (case insensitive), a message should be displayed informing the user that their coffee (or tea, whichever they chose) will be ready in five minutes. If the user response is incorrect, the input box should be redisplayed. This process should continue until a correct response is obtained or the user cancels.



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Some Like It Hot! (10 points)



All you science whizzes out there are probably familiar with the Kelvin temperature scale, named after the British mathematician and engineer William Thomson Kelvin, who proposed it in 1848.

The Kelvin temperature scale starts with 0 degrees at “absolute zero”, the temperature at which molecular energy is at a minimum and below which no temperature exists. Kelvin degrees are the same size as Celsius degrees and 0 degrees Kelvin corresponds to -273.15 degrees Celsius, so that water freezes at 273.15 degrees Kelvin (0 degrees Celsius) and water boils at 373.15 degrees Kelvin (100 degrees Celsius).

But are you familiar with the Rankine temperature scale (named after the Scottish engineer and physicist William John Macquorn Rankine, who proposed it in 1859)? (“Rankine” is pronounced “RANK-in”.)

The Rankine temperature scale begins with 0 degrees at “absolute zero” just like the Kelvin temperature scale, except that its degrees are the same size as Fahrenheit degrees. So 0 degrees Rankine corresponds to -459.67 degrees Fahrenheit, water freezes at 491.67 degrees Rankine (32 degrees Fahrenheit), and water boils at 671.67 degrees Rankine (212 degrees Fahrenheit).

Design a Visual Basic program that allows the user to type a Rankine temperature into a text box. When a button is clicked, the equivalent temperatures in Fahrenheit, Celsius, and Kelvin are displayed using one or more labels placed on the form.

Use the equivalencies provided in this problem to create your conversion formulas.

All calculated temperatures should be displayed rounded to the nearest one hundredth of a degree.

Your program should reject invalid input.

Information source: answer.com



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Slot Machine (20 points)

You are to design a slot machine. When the program starts, three blank images are displayed. When the user clicks a button displaying the word "Roll", the program randomly selects and displays any combination of three images from a total of six images that you select*. A cumulative score is also displayed based on the rules below. Only selected images should be visible on your form.

One of the images (you decide) is the "loser". If that image appears, the player loses all money. (Be sure to indicate which image it is.)

Another of the images (you decide) is a "wild card". If that image appears, it can match with any other image except the "loser". (Be sure to indicate which image it is.)

Scoring is as follows:

```
loser is displayed - lose all money  
2 matches - win $10 (unless loser is displayed)  
3 matches - Jackpot! win $100 (can't be losers)  
all else, roll again
```

* the six images have been placed in a folder named **nncc2008_pics** under **My Documents** on your computer to be used for this purpose. An additional image named "blank.jpg" is provided to be used when the program starts.





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Make A Face (30 points)



The form contains, at minimum, a slider (*called a **TrackBar** in Visual Basic 2005*) with values from 50 to 100 and a drop-down combo box listing at least six colors. Labels appear appropriately.

The user can select a value using the slider and a color using the drop-down combo box, then click anywhere on the form any number of times. Each time the user clicks, a round smiley face is drawn whose center is the place where the user clicked, whose radius in pixels is the value of the slider, and whose eye color is the color selected in the drop-down combo box. The face should have two circles for eyes (filled with the eye color) and a semicircle for a mouth.

We don't expect your faces to look nearly as good as the one pictured above. 😊



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Visual Basic – Ruberic For Teams

Coffee or Tea (10 points)

	Max Points
Title of problem and team's name are displayed.	1
Two command buttons with appropriate captions.	1
<i>First button</i>	
When clicked, a color common dialog box appears.	1
If Ok is clicked, the background of the form is correctly changed.	1
<i>Second button</i>	
When clicked, an Input Box asks for a preference of coffee or tea.	1
The default is set to "Coffee"	1
The position is in the uppert left hand corner of the screen.	1
The response for a correct message is correct.	2
Input repeats if the response is incorrect.	1
TOTAL	10

Some Like It Hot! (10 points)

	Max Points
Title of problem and team's name are displayed.	1
Input:	
Text box to type a Rankine temperature is correctly labeled.	1
Output:	
Rejects invalid input (negative values).	1
Correct Fahrenheit temperature.	2
Correct Celsius temperature.	2
Correct Kelvin temperature.	2
All 3 calculated temperatures are displayed rounded to the nearest one hundredth of a degree (appending zeros if needed).	1
TOTAL	10

Slot Machine (20 points)

	Max Points
Program displays three blank images at startup.	1
Roll button picks 3 random images, which are correctly displayed	3
Uses 6 non-blank images	1
Wild card image: specified=1, works=2	2
Loser image: specified=1, works=2	2
Detects & displays message (+1 each) <ul style="list-style-type: none"> • 2 of a kind • 3 of a kind • Loser (& loses all) • all else roll again 	4
Cumulative Score works (+1 each) <ul style="list-style-type: none"> • 2 of a kind • 3 of a kind • Loser (& loses all) • all else roll again 	4
Scoring rules are displayed	1
Clever code logic: <ul style="list-style-type: none"> • uses functions (2 points) • uses nested ifs (1 point) 	2
TOTAL	20

Make A Face (30 points)

	Max Points
Title of problem and team's name are displayed.	1
Form contains a slider.	1
Slider's min and max values are 50 and 200.	1
Combo box lists at least six colors.	1
Slider and combo box are labeled appropriately.	1
When user clicks on the form, a face, or part of a face (for partial credit) is drawn as follows:	
Outline of Face:	
<ul style="list-style-type: none"> • A circle (for the face) is drawn. 	4
<ul style="list-style-type: none"> • Circle's center is click location. 	4
<ul style="list-style-type: none"> • Circle's radius is value of slider. 	4
Eyes (no credit if no face circle):	
<ul style="list-style-type: none"> • Two smaller circles for eyes, not intersecting each other, are drawn inside the face circle 	3
<ul style="list-style-type: none"> • Both eye circles are filled with the eye color selected in the eye color combo box. 	3
Mouth (no credit if no face circle):	
<ul style="list-style-type: none"> • A semicircle representing a smile (lower half of circle), not intersecting the eye circles, is drawn inside the face circle. 	3
Eyes and Mouth are placed and sized proportionally to the size of the circle (works for large or small faces, no partial credit, no credit if no face circle).	4
TOTAL	30