Name: Thanishka Gamage ENEO 1100 09/23/2021 Section 003 Signature . Family Team : 24 HW 4.1 Task1 Problem Statement; Develop a program that will accurately give the actual height of a fish when given the refractive indexes of air, glass, and water, as well as the distance from the viewer from the glass, the thickness of the glass, the distance from the fish to the glass, and how high up the fish is in the wiewer's perspective. Diagram: d3 d, da S tart Input refractive Indexes Input distances/ Compule the angles refracted using the distances & refrative Indexes gire Using the angles, Calculate the containing height with trig on ometry total up the height output height End

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HW 4.1

ENEO 1100

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09/23/2021 Section 003

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Theory

5 m (a) = A

 $tun(a) = \frac{A}{R}$

Law of refraction: na Sin (Da) = hb sin (Db)

Assumptions

- O Glass is completely flat
- @ Fish is stationary
- 3 Person has good vision
- 6 Given measurements are exact
- B Everything is perfectly perpendicular to the ground.
- @ The fish and the person is lined up perfectly.

Solution

See file 4p1_HW_Task1_gamage tol. vi

Verification

70st case	Expected route	Actual Result
Height = 1ft, nair=1.00, ntmk=1.69	da 2005	a coldination
hwater = 1.33, Operson=2ft, Ofish=1ft	0.865 f	0-864461
Dtmk = 0.5 A		
Height = 0.5ft, hair=1.06, h tunk=1.9, n hain=1.2	N. C.	
Depension = 2 ft , Ofish = 1 ft , Ofan 10= 0.5ft	-0-44 ft	-0.44fl

> The program passes,

Conclusion.

A program to determine the actual height of a fish using refindive indexes of air, glass & water and the perceived height of the fish worle by Computing the angles refracted with trigonometry, and finally displaying the total or actual heights.

ENED 1100 09/23/2021 HW 4.1

Task2

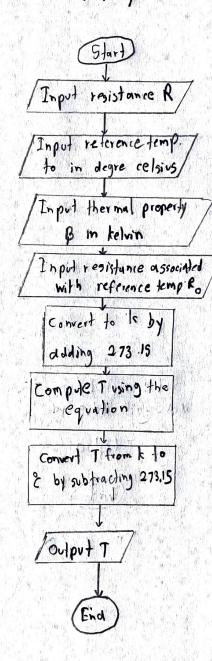
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Section 003

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Problem statement: Write a program that would determine the temperature in degree celsis of a liquid in a pipe using the thermistor's resistance, reterence temperature/ reststance pair and the thermal property of the material

Diagram:



Theory

$$T = \frac{\beta T_0}{T_0 \ln \left(\frac{R}{R_0}\right) + \beta}$$

k = °c + 273-15

Assumptions to cannot be sumaller than or equal to Ok. @ Rosistance must be larger than O.

Solution:

See file 4p1_Hw_Task2_gamagetd.vi

ENED 1100 09/25/2021 Section: 003 Norme: Thuishea Gamage
HW 4.1 Task 2 Team: 24 Signature: furthe Gamage

Verification

Test Case:	Expected value	Actual value
P=50k; To=100°c; Ro=200ss. R=150ss	- 598.485°C	- 5 98: 485°C
β-3969k, T ₆ =85°c, R ₆ =1075Ω R=1075Ω	85 ° c	gs°c

=) Pass

Conclusion

The program determined the temperature of a liquid inside a pipe by first converting all input temperatures to Irelain, calculating T using the formular of the thermistor, and then converting T back to degree celcius before outpuling the final answer of T.