

UNIVERSITY OF TECHNOLOGY,
JAMAICA SCHOOL OF COMPUTING & INFORMATION
TECHNOLOGY

DEGREE IN COMPUTING

LAB TEST 1 - PROLOG

DATE: October, 2020

SUBJECT: ARTIFICIAL INTELLIGENCE Due 11:59pm:

INSTRUCTIONS: This paper contains two pages and two questions.

PLACE ALL ANSWERS IN A SINGLE FILE CALLED **LABTEST_ID#.PL** (E.g., **labtest_01234.pl**). THE KNOWLEDGEBASE SHOULD CONTAIN STUDENT NAME AND ID#. FAILURE TO DO SO WILL RESULT IN LOSS OF MARKS. Upload your PL file to Google Classroom or email to **hjprox6x@gmail.com**

QUESTION 1(Arithmetic)

The tax payable on incomes paid to employees of a certain company is as outlined below:

Taxable Income	Tax Payable
From \$1 - \$5,461.99	NIL
From \$5,462.00 - \$18,893.99	10% of income
From \$18,894.00 - \$39,499.99	15% of income
From \$39,500.00 - \$55,899.99	20% of income
\$55,900.00 and over	25% of income

Married employees get a tax refund of \$50, while unmarried employees receive \$60. Tax refund contributes to a person's disposable income.

Write a prolog predicate **taxable/0** that will accept the user's name, tax revenue number and income. Calculate the tax payable on their income and display their name, tax revenue number, income, tax refund, tax payable and disposable income. (Disposable Income = Taxable Income – Taxes + Refund)

Sample run:
?- taxable.

Enter name: 'John Brown'.
Enter Tax Revenue Number: '346-028-125'.
Enter income: 35656.44.
Are you married y/n?: y.

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*****Tax Payable Report***

Name: John Brown
Number: 346-028-125

Taxable Income: \$35,656.44
Taxes: \$5348.47
Refund: \$50.00
Disposable Income: \$30,357.97

[15 marks]

Question 2 (Problem Solving)

Formalize the following problem by implementing the necessary Prolog facts and rules.

Vehicles may be purchased from various car dealers. Zeus and Staub are reasonable car dealers, Mercury is expensive. Zeus's origin is in USA, Mercury is in Norway and Staub is in Japan. Zeus ships to Norway, Japan and USA. Mercury ships to Japan and Germany only and Staub ships to Germany and USA. Staub and Zeus sells Mazda and Toyota, Mercury sells Hyundai.

Lisa wants to buy a reasonable Mazda or a Toyota from a dealer that does not originate in Japan and will ship the goods to Germany or USA. Tanya wants to buy a reasonable Mazda or a Toyota from a dealer who will ship to Germany. Thomas wants a Hyundai from a dealer that will ship to Germany but doesn't care about the cost.

Write a knowledge-base in PROLOG which encodes the above knowledge in as general a form as possible, and a predicate, which, when executed, generates a sequence of statements of the form:

<buyer> can purchase <car> from <dealer>

All possibilities should be generated.

[15 marks]

*****End of Test*****

