January 01, 2022

EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering
Mini Project, Fall 2021 Semester

Course: CSE 366, Artificial Intelligence, Section 2
Instructor: Md Al-Imran, Lecturer, Department of CSE
Full Marks: 40 (10 will be counted for final grading)

Note: Solve all the problems

1. Write a program in Python to calculate income tax. Bear in mind, the program will take input from the user. The user may provide any kind of input. It is your responsibility to handle unexpected inputs with appropriate process. Please give attention to the following data- [CO4, C3 Marks: 8]

Income	Tax
First 300k Taka	0%
Next 100k Taka	5%
Next 300k Taka	10%
Next 400k Taka	15%
Next 500k Taka	20%
Rest of ALL	25%

Some special cases=> Women and Citizens with age > 65, tax for First 350K is 0%. For Disabled => First 450K carries 0% tax. Parents of disabled pay 0% tax on First 350K. And wounded freedom fighters pay 0% on first 475K Taka.

2. Conics: Give me the following graphs, include your code in the lab report. Describe the code also. Put the equations and name of the curve in your plot as well as report. [CO4, C3 Marks: 6]
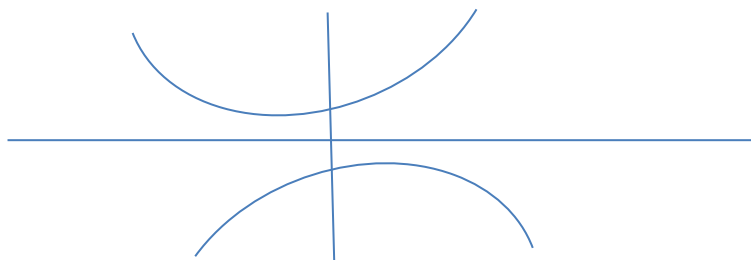

Figure 1: Conics

3. As an AI engineer you are asked to design a robot which will be able to [CO4. C3
solve any kind of maze. Now build the maze solver code and simulate the Marks: 12]
code on your preferred IDE for Pyhton. In this regard, you are also asked
to solve it using both informed search and uninformed search tehniques.
Also provide a comparative code analysis showing the differences among
the techniques.

**Instructions: You must have to apply the search code you have written
in the lab classes. Do not apply libray functions for the search
algorithms. Online solution is not accepted as plagiarism is strictly
forbidden. But you are encouraged to study from quality materials.
You may also follow any acceptable mechanism to build the following
maze and to find the output.**

Hints: MAP should be a variable as follows

```
MAP = """
##############################
#             #                   #     #
#  ####       ########            #     #
#   o #       #                   #     #
#     ###         #####   ######     #
#        #    ###    #                   #
#        #        #    #  #  #     ###
#        #####      #      #  # x    #
#                   #        #     #
##############################
"""
```

**Where moving diagonal path cost = 1.7
and moving regular path cost = 1.0
Consider euclidean distance for computing the heuristic values.**

4. In the logic program, we specify the puzzle as follows: [CO4, C3
Marks: 14]

- Steve has a blue car.
- The person who owns a cat lives in Canada. Matthew lives in the
  USA.
- The person with a black car lives in Australia.
- Jack has a cat.
- Alfred lives in Australia.
- The person who has a dog lives in France.
- Who has a rabbit?

The goal is the find the person who has a rabbit. Here are the full details about the four people as puzzle solver input data:

	Pet	Car Color	Country
Steve	dog	blue	France
Jack	cat	green	Canada
Matthew	rabbit	yellow	USA
Alfred	parrot	black	Australia