



THE UNIVERSITY
OF LAHORE
**ISLAMABAD
CAMPUS**

Artificial Intelligence (CS13217)

Lab Report

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Experiment # 1

Download and in stall python

Objective

To understand how download and install python.

Software Tool

1. Opersting system ,window 10
2. Sublime text, Version 3.0
3. Python

1 Theory

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English key-words frequently whereas the other languages use punctuations. It has fewer syntactical constructions than other languages.

Python was developed by Guido van Rossum in the late eighties and early nineties at the National Research Institute for Mathematics and Computer Science in the Netherlands.

1. Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, SmallTalk, and Unix shell and other scripting languages.
2. Python is copyrighted. Like Perl, Python source code is now available under the GNU General Public License (GPL).
3. Python is now maintained by a core development team at the institute, although Guido van Rossum still holds a vital role in directing its progress.
4. Meanwhile, Python 3.0 was released in 2008.

Python 3 is not backward compatible with Python 2. The emphasis in Python 3 had been on the removal of duplicate programming constructs and modules so that "There should be one – and preferably only one – obvious way to do it." Python 3.5.1 is the latest version of Python 3.

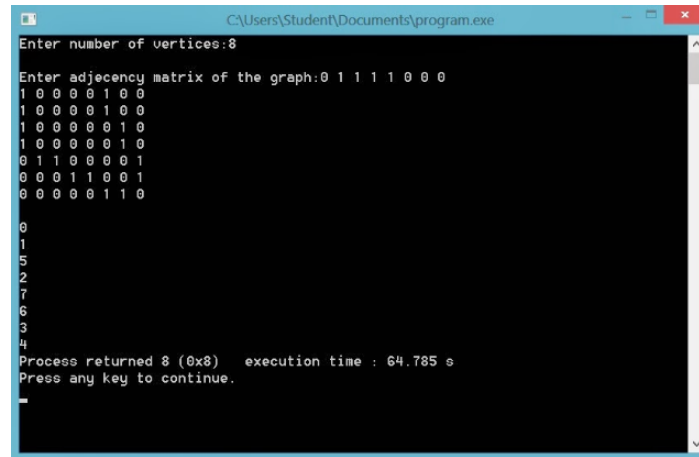


Figure 1: Time Independent Feature Set

2 Task

2.1 Procedure: Task 1

The minimum number of moves required to solve a Tower of Hanoi puzzle is $2n - 1$, where n is the number of disks.

2.2 Procedure: Task 2

```
import numpy as np

def incmatrix(genl1, genl2):
    m = len(genl1)
    n = len(genl2)
    M = None \#to become the incidence matrix
    VT = np.zeros((n*m,1), int) \#dummy variable

    \#compute the bitwise xor matrix
    M1 = bitxormatrix(genl1)
    M2 = np.triu(bitxormatrix(genl2),1)

    for i in range(m-1):
```

```

for j in range(i+1, m):
    [r, c] = np.where(M2 == M1[i, j])
    for k in range(len(r)):
        VT[(i)*n + r[k]] = 1;
        VT[(i)*n + c[k]] = 1;
        VT[(j)*n + r[k]] = 1;
        VT[(j)*n + c[k]] = 1;

    if M is None:
        M = np.copy(VT)
    else:
        M = np.concatenate((M, VT), 1)

VT = np.zeros((n*m, 1), int)

return M

```

3 Conclusion