Artificial Intelligence

Final Project

Wake up Time

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Description of Problem

At this Project, our main object is determine when a person should wake up. According to some parameters, our Project will find wake up time. So we decided to use neural network. The inputs are Waking up time of one day ago, Tiredness, Need for late sleep and Day. And output consists of 4 decision classes as 06.00, 07.00, 08.00, 09.00.

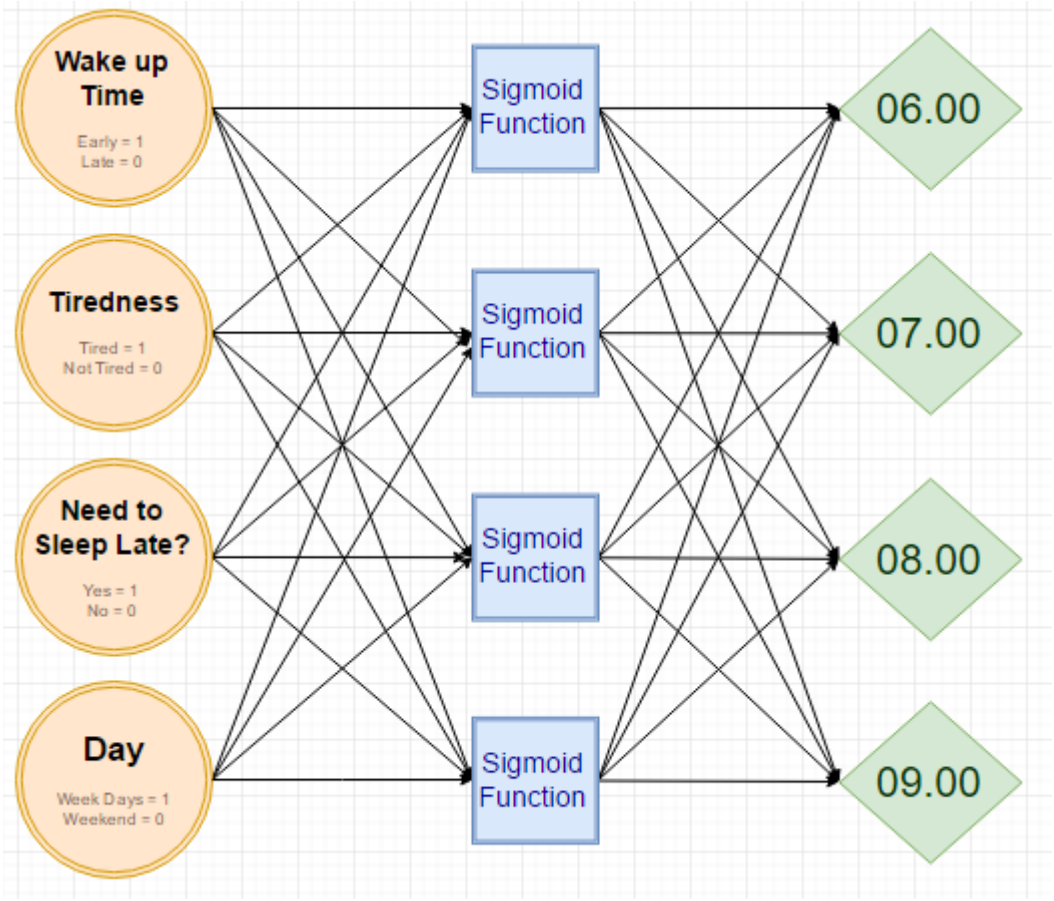
Waking up time : 1 early , 0 late.

Tiredness : 1 tired, 0 not tired.

Need for sleep : 1 yes, 0 no.

Day: 1 weekdays, 0 weekend.

Our neural network shown below.



After training,effectiveness of programme is 83% and efficiency of programme is 0.05 seconds.

Functionalities of Programme

Our Programme loads data from excel file. Then data divided automatically input and output. As activation function, it uses sigmoid function. Training process continues until the error value is reached. In training process our programme uses gradient descent as back propagation algorithm. During this process, programme shows error rate every 100 steps. At the end of training process shows predictions and check accuracy of results. Programme also shows effectivenes and efficiency of algorithm.

Technologies

We used Python 2.7.13 as programming language. To read data from excel file, we used pandas module version 0.19.2 and to handle with data, we used numpy module version 1.11.3. Also we used time module that is one of the standart modules.

Installation

Windows

- Download Python 2.7 from this site and install.

  https://www.python.org/downloads/windows/

- Download available Numpy version from this site and install.

  https://pypi.python.org/pypi/numpy

- Download Pandas from this site and install.

  http://pandas.pydata.org/getpandas.html

Also you can download through PIP. It is explained below Linux.

Linux

- Most of Linux distribution has Python 2.7 as default, but if not you can install by typing the following in the command prompt.

  On Debian-like Linux

  ```
  sudo apt-get install python2.7
  ```

  On CentOS-like Linux

  ```
  sudo yum install python
  ```

- We will install other modules via PIP. It is a package management system for Python. Firstly, download it from this site.

  https://bootstrap.pypa.io/get-pip.py

Then, type the following in the command prompt.

```
python get-pip.py
```

- Type the following to install pandas and numpy modules.

```
pip install numpy
```

```
pip install pandas
```

Running Neural Network

If all this installations completed smoothly, you can run easily neural network by typing following in the command prompt.

```
python NeuralNetwork.py
```

References

- http://iamtrask.github.io/2015/07/12/basic-python-network/