



Princess Sumaya جامعة
University الأميرة سميرة
for Technology للتكنولوجيا

Princess Sumaya University for Technology
The King Hussein School for Computing Sciences
Data Science Department
Lab 5 – Alpha-Beta Pruning

Lab Objectives

- To acquire experience using Alpha-Beta Pruning.
- To acquire experience formulating and representing problems.

Lab Instructions

- Create a new notebook and name it by your “ID-FirstName-LastName”.
- Write your name and ID in the first cell in your notebook.
- You must upload your solutions to e-learning as ".ipynb".
- Each lab assignment is of 10 marks.
- You are supposed to submit your solution by **Wednesday (5/1/2022) at 11:59 PM.**
- Be prepared to discuss your solution, if you fail to answer the questions about your solution then it will be reduced or canceled.
- All acts of cheating and/or plagiarism will be graded zero.



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Lab Exercise

Develop a tic-tac-toe (X-O) game using Python. The first player (X) is a human and the second player (O) is the computer that uses an alpha-beta pruning algorithm to choose the next move. You are given a notebook and asked to implement the MiniMaxAB() function.

Sample Output:

➡ Pick a position(1-9): 1

```
| x | |  | |
```

```
-----  
|  | |  | |
```

```
-----  
|  | |  | |
```

```
-----  
=====
```

```
| x | |  | |
```

```
-----  
|  | o | | |
```

```
-----  
|  | |  | |
```

```
-----  
=====
```

Pick a position(1-9): 3

```
| x | |  | x |
```

```
-----  
|  | o | | |
```

```
-----  
|  | |  | |
```

```
-----  
=====
```

```
| x | | o | | x |
```

```
-----  
|  | o | | |
```

```
-----  
|  | |  | |
```

```
-----  
=====
```

Pick a position(1-9): 8

```
| x | | o | | x |
```

```
-----  
|  | | o | | |
```

```
-----  
|  | | x | | |
```

```
-----  
=====
```

```
| x | | o | | x |
```

```
-----  
| o | | o | | |
```

```
-----  
|  | | x | | |
```

```
-----  
=====
```

Pick a position(1-9): 6

```
| x | | o | | x |
```

```
-----  
| o | | o | | x |
```

```
-----  
|  | | x | | |
```

```
-----  
=====
```

```
| x | | o | | x |
```

```
-----  
| o | | o | | x |
```

```
-----  
|  | | x | | o |
```

```
-----  
=====
```

Pick a position(1-9): 6

```
| x | | o | | x |
```

```
-----  
| o | | o | | x |
```

```
-----  
|  | | x | | |
```

```
-----  
=====
```

```
| x | | o | | x |
```

```
-----  
| o | | o | | x |
```

```
-----  
|  | | x | | o |
```

```
-----  
=====
```

Pick a position(1-9): 7

```
| x | | o | | x |
```

```
-----  
| o | | o | | x |
```

```
-----  
| x | | x | | o |
```

```
-----  
=====
```

Draw