Artificial Intelligence: `Lab Assignment-1`

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1 Question-1

Three jealous husbands and their wives need to cross a river using a single boat. At no time should any of the women be left in company with any of the men, unless her husband is present. The boat can carry up to two passengers and can not move by itself.

1.1 Psuedo Code-

choose a couple h-i:w-i to move
move w-i and another wife across
move the other wife back
move both remaining wives across
move one of the other wives back
move h-i and another husband across
move the other couple back

River crossing number of iterations-
C(n) = 6 + C(n-1)
n>2

1.2 State-Space Search-

For n = 3, (n is the number of couples), the minimum path has a state space of 11 states.

1.3 Implementation-

Figure 1: States For The Optimal path

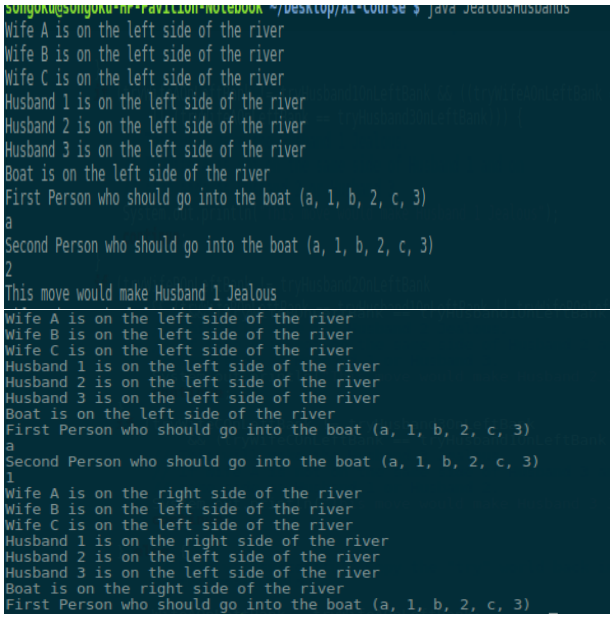


Figure 2: Code Output Results for the first results

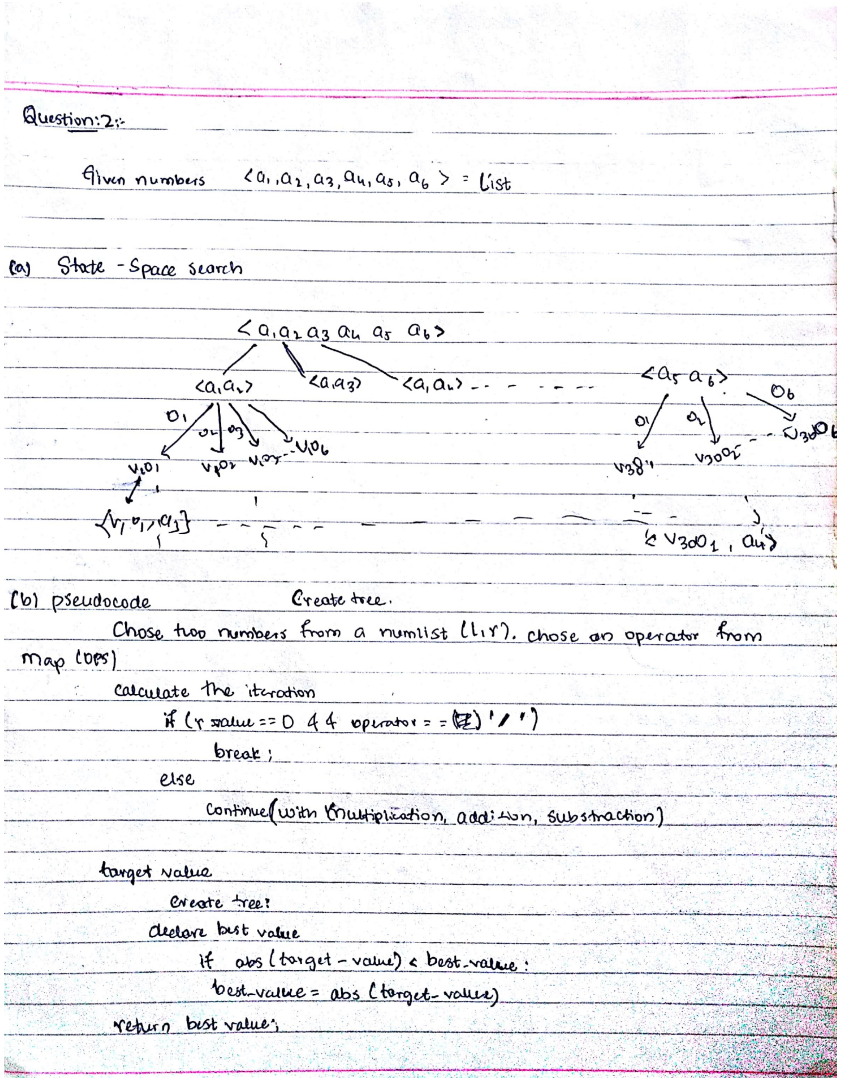
1.4 Code-Implementation-

Link for the Code on github[1]

2 Question-2

Objective is to use the given six numbers to arithmetically calculate a random chosen number. Only the four arithmetic operations of addition, subtraction, multiplication and division may be used, and no fraction may be introduced into the calculation.
Each number may be used at most once.
The initial six numbers should be taken as input from the user. The target number should be generated randomly from 100 to 999.
If the exact expression is not found, the program should print out the expression that evaluates to a value that is the closest to the target value.

2.1 Implementation-



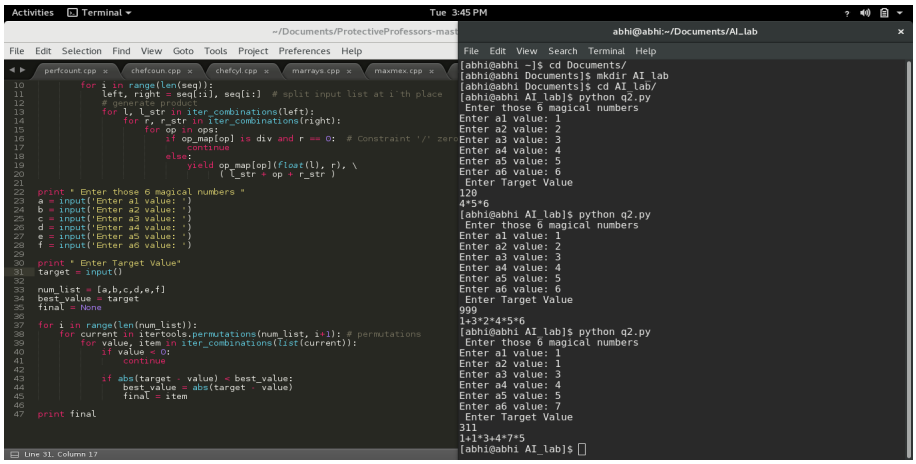


Figure 3: Code Output Results for the Second results

Source Code link is given in references.

References

Question-1-Source-Code
`https://github.com/Ujwal2910/AI_Lab_Assignments/blob/master/Lab_Assignement_1/river_jealous.java`

Question-2-Source-Code
`https://github.com/Ujwal2910/AI_Lab_Assignments/blob/master/Lab_Assignement_1/q2.py`