EPL - ECOLE POLYTECHNIQUE DE LOUVAIN

LINGI2261 - ARTIFICIAL INTELLIGENCE

Report of fourth assignement

Knapsack problem

Professor :

Yves DEVILLE

Students : (Group 1)

Benoît BAUFAYS 22200900

Julien COLMONTS 41630800

Program :

SINF21MS/G

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1 The Knapsack Problem

1.1 Diversification versus Intensification

Question 3 : Compare the 3 strategies on the given knapsack instances. Report in a table the results of the tests. Interesting metrics to report are: the computation time, the value of the best solution and the number of steps when the best result was reached (Node.step may be useful). A good way to eliminate the effect of the randomness of some of the strategies is to run the computation multiple times and take the mean value of the runs. For the first and the third strategy, each instance should be tested 10 times.

Question 4 : Answer the following questions :

(a) What is the best strategy ?

(b) Why do you think the best strategy beats the other ones ?

(c) What are the limitations of each strategy in terms of diversification and intensification ?

(d) What is the behaviour of the different techniques when they fall in a local optimum ?

2 Propositional Logic

2.1 Models and logical connectives

Question 1 : For each sentence, give the number of models that satisfy it (considering the proposition variable A, B, C and D).

1. $(A \wedge B) \vee (\neg B \wedge C)$:

Models :

A	B	C
V	V	V
V	V	F
V	F	V
F	V	V

2. $A \wedge \neg B$:

   Models :

A	B
V	F

3. $A \wedge \neg B$:

   Models :

A	B
V	F