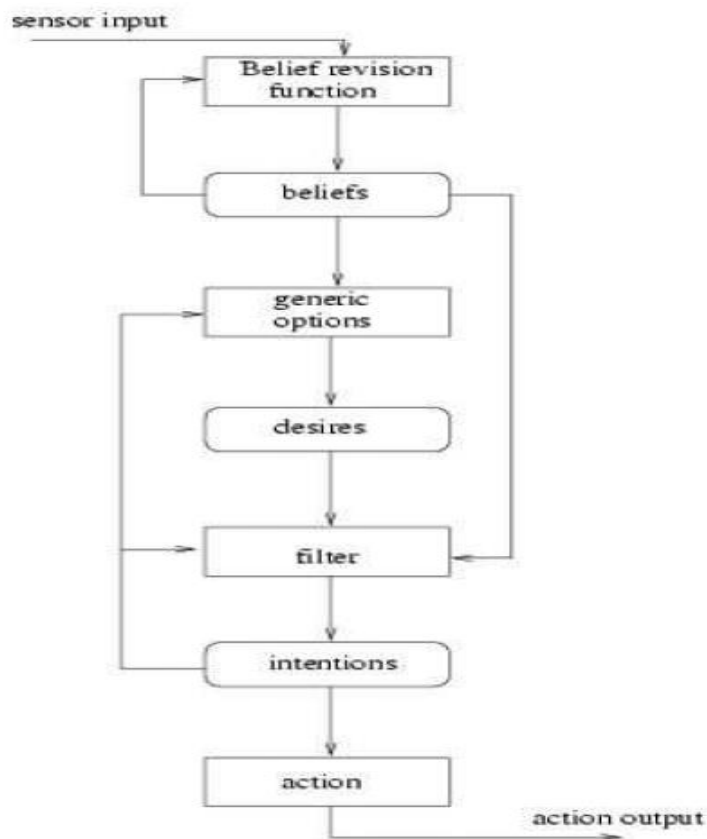


# CPT302 Week 5 In-Class Exercises - bis

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Q1. The following diagram illustrates the schematic of a practical reasoning (“BDI”) agent:



State the principal function of each component and briefly describe how they interact with each other.

Ans: The belief revision function (brf) takes perceptual input and the agent's current beliefs, and using these, determines a new set of beliefs. The option generation function determines options available to the agent (using current beliefs about environment and current intentions). The options (i.e. desires) represent possible courses of actions available to the agent. The filter function implements the agent's deliberation process and determines the agent's intentions on the basis of current beliefs, desires and intentions. The current intentions represent the agent's current focus (i.e. those states of affairs that have been committed to trying to bring about). Finally, the action selection function determines an action to perform on the basis of current intentions.

Q2. Explain briefly the different types of commitments.

Ans:

- Blind commitment
  - A blindly committed agent will continue to maintain an intention until it believes the intention has actually been achieved. Blind commitment is also sometimes referred to as fanatical commitment
- Single-minded commitment
  - A single-minded agent will continue to maintain an intention until it believes that either the intention has been achieved, or else that it is no longer possible to achieve the intention
- Open-minded commitment
  - An open-minded agent will maintain an intention as long as it is still believed possible

The following pseudo-code defines a control loop for a practical reasoning ("BDI") agent:

```
1.  $B := B_0$ ;  
2.  $I := I_0$ ;  
3. while true do  
4.   get next percept  $\rho$ ;  
5.    $B := brf(B, \rho)$   
6.    $D := options(B, I)$ ;  
7.    $I := filter(B, D, I)$ ;  
8.    $\pi := plan(B, I, Ac)$ ;  
9.   while not (empty( $\pi$ ) or succeeded( $I, B$ ) or impossible( $I, B$ )) do  
10.     $\alpha := hd(\pi)$ ;  
11.    execute( $\alpha$ )  
12.     $\pi := tail(\pi)$   
13.    get next percept  $\rho$ ;  
14.     $B := brf(B, \rho)$ ;  
15.    if reconsider( $I, B$ ) then  
16.       $D := options(B, I)$ ;  
17.       $I := filter(B, D, I)$ ;  
18.    end - if  
19.    if not sound( $\pi, I, B$ ) then  
20.       $\pi := plan(B, I, Ac)$   
21.    end - if  
22.  end - while  
23. end - while
```

Q3. Recall that “Practical Reasoning = deliberation + means ends reasoning”. With reference to the above code answer the following questions:

- What commitment strategy is used in this code from Line 9 – Line 22?
- What should be modified in this code from Line 9 – Line 22 if the commitment strategy ‘Single-minded commitment’ is used?
- What should be modified in this code from Line 9 – Line 22 if the commitment strategy ‘Open-minded commitment’ is used?

Ans:

- Single-minded commitment
- Nothing
- Replace “impossible(I,B)” by “believeimpossible(I,B)”