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Assignment 09

1.What is deductive approach and give 2 example of it?

* It is to understand something through reasoning using prior knowledge and observing results of experiments using your hypothesis.
* Example:
* Example1:
* Generalization: if you know that all the beans in my bag are white.
* Specific case: you take a bean from my bag.
* Result: then that bean must be white.
* Example2:
* Generalization: all students of ITC are Male.
* Specific case: Vysing is a student at ITC.
* Result: so that Vysing is Male.

2.what is inductive approach? Give 2 examples of it?

* It is to understand something through observation with no prior knowledge and concluding at the end of your observations.
* Example:
* Example1:
* Basic step: you take bean from my bag, and it is white.
* Induction step: you take 2nd then 3rd until thousand of beans from my bag and they are all white.
* Conclusion: then you conclude that all beans my bag are white.
* Example2:
* Basic step: we have mathematical 2n>0, n is positive integers.
* Induction step: you take
  + n=1, =>2n=2\*1=2>0
  + n=2, =>2n=2\*2=4>0

. .

. .

* + n=N, =>2n=2\*n>0
* Conduction: so that all n is positive integers =>2n>0.

3. what is the concept of first principal Induction?

* If we have a propositional function P(n) and we want to prove that P(n) is true for any natural number n, we do the following
* Basic step: show that P(0) is true.
* Inductive step: show that if P(n) then P(n+1) for nay nN.
* Conclusion: then P(n) must be true for any nN.

4. Show that “n+1 2n” for all positive integers n?

* Basic step: show that P(1) is true.

P(1) is true, 1+1

* Inductive: show P(n) is true, then P(n+1) is true assume that n+1n is true

We need to show P(n+1) is true

n+22n+1

we start from n+1n:

n+1+1 n +1 n +21 = 2n+1

so that if n+1 n then n+1n+1

* Conclusion: the P(n) must be true for any positive integer n+1n  is true for nay positive integers.

5. what is the concept of second principal induction?

* There is another proof technique that is very similar to the first principal mathematical induction.

6. Prove that this rule is true every natural number n ?

13+23+33+….+n3= n2(n+1)2/4

* Basic step: for n=1, 13=1122/4
* Inductive step:

S(k)=k2(k+1)2/4 (1)

We must now show that the formula is also true for n=k+1; that

S(k+1)=(k+1)2(k+2)2/4 (2)

To do that, add the next cube to s(k), by (1)

S(k+1)=s(k)+(k+1)3

=K2(k+1)2/4 +(k+1)3

=[k2(k+1)2+4(k+1)3]/4

=[(k+1)2(k2+4(k+1))]/4

On taking (k+1)2 as a common factor;

=(k+1)2(k2+4k+4)/4

=(k+1)2(k+2)2/4

* Conclusion : Therefore 13+23+33+….+n3= n2(n+1)2/4