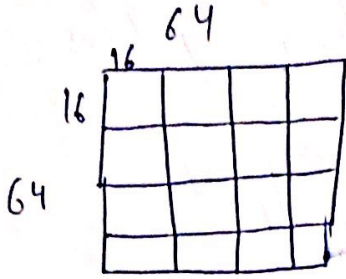


* \rightarrow Pre-Processing \rightarrow as we can only handle 16×16 image & given is 64×64 \therefore we will divide given image into 16 patches of 16×16 & we will have 16 dictionaries for each of the patch (location)



\rightarrow Grayscale of images can also be done in order to save memory.

\rightarrow if image is not patch, we will try to keep it ^{to patch} so that it becomes patch

* Proposed Dictionary Learning Algorithm:-

we will supply high resolution images & then we will make 16 diff dictionaries & these will serve as 1st level Dictionary; it will have first level representation, Now we will learn 2nd level Dictionary & it's 2nd level rep.

for i/p image, we will generate 16 patches & then for each patch a separate dictionary & its sparse coefficients Λ_I . for sketch image, the same process will be done to learn a dictionary & its sparse coefficients Λ_S .

Now we will have to learn a Mapping b/w sparse rep. of Λ_I & Λ_S i.e. sparse rep. of ~~image~~ & sparse rep. of sketch.

Now given an i/p image, we will learn its latent rep. i.e. Λ_I . From mapping of Λ_I we will learn Λ_S from learned w. & Then using Dictionary of sketch \rightarrow we will try to construct sketch.

c). Training of Algorithm given I & S

over all Dictionary, Dictionaries (16 Dictionaries for I & 16 for S)
after divide into patches

$$\begin{aligned} & \min \{ D_I, D_S, W \} \quad \| I - D_I \Lambda_I \|_F^2 + \\ & \quad \| S - D_S \Lambda_S \|_F^2 \\ & + \gamma \| \Lambda_I - W \Lambda_S \|_F^2 + \lambda_y \| \Lambda_I \| + \\ & \quad \lambda_w \| W \|_F^2 \\ & \text{s.t. } \| d_{I,i} \|_2 \leq 1, \| d_{S,i} \|_2 \leq 1, \forall i \end{aligned}$$

