Answer 1:

Original Slicing Floorplan Area (Figure 1)

Section 1: In case an aspect ratio of 1 is unacceptable, the new aspect-ratio selections of all the blocks are given in Figure 2 (in bold):

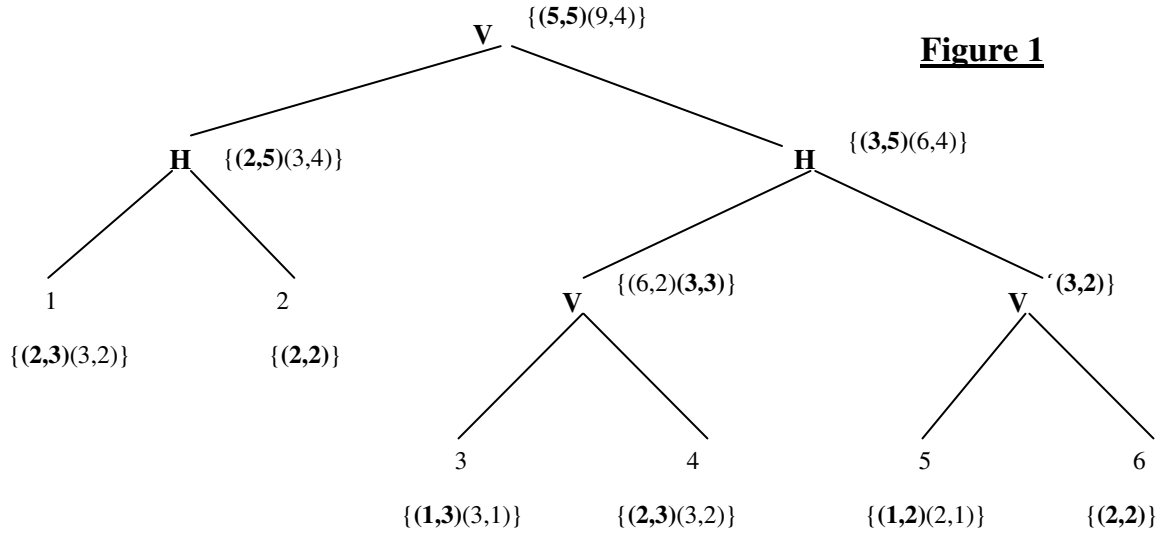
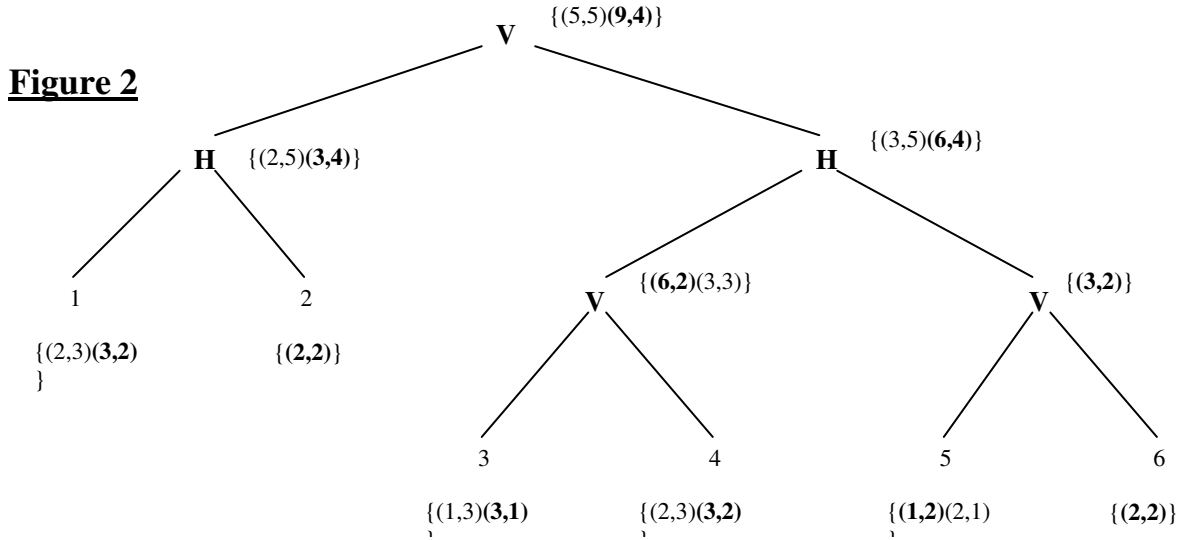


Figure 1

Figure 2



Section 2: For determining the lower left corner of each block, we place them on a grid (see Figure 3):

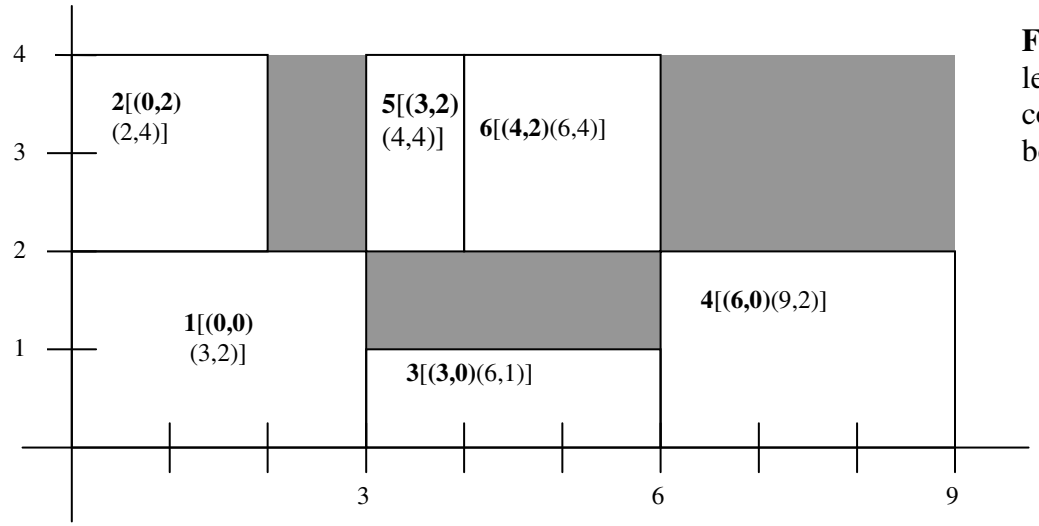


Figure 3: lower left corners are the coordinates in bold

Section 3: Calculating Estimated wire length requirements for Manhattan Routing.

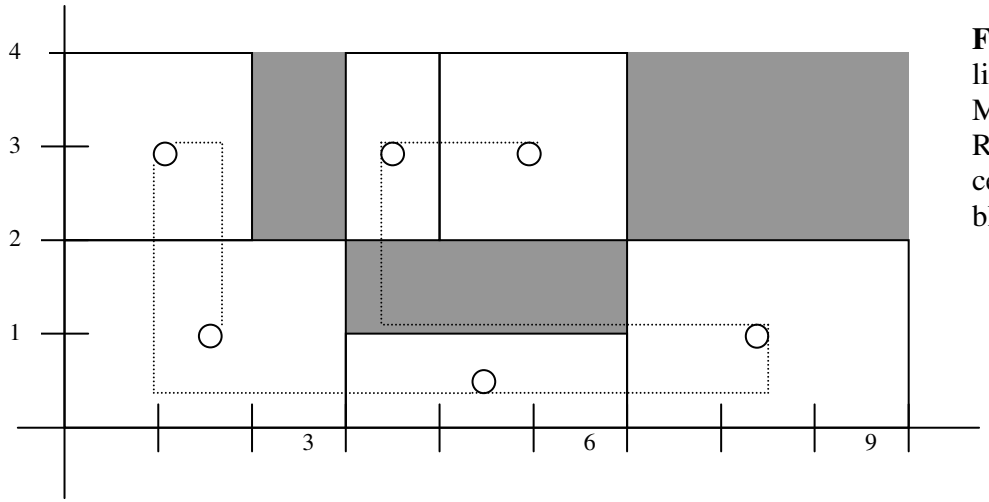


Figure 4: Dashed lines represent Manhattan Routing from the centres of all blocks

From Figure 4 above, we can calculate the Manhattan distances between the center points of the blocks:

From **1** (1.5, 1) to **2** (1, 3):
X-distance = 0.5, Y-distance = 2,
From **2** (1, 3) to **3** (4.5, 0.5):
X-distance = 3.5 Y-distance = 2.5,
From **3** (4.5, 0.5) to **4** (7.5, 1):
X-distance = 3 Y-distance = 0.5,
From **4** (7.5, 1) to **5** (3.5, 3):
X-distance = 4 Y-distance = 2,
From **5** (3.5, 3) to **6** (5, 3):
X-distance = 1.5 Y-distance = 0,

Total wiring distance = Sum of all X-distances + Sum of all Y-distances
= (0.5 + 3.5 + 3 + 4 + 1.5) + (2 +2.5 +0.5 + 2 + 0)
= 12.5 + 7
= 19.5 unit lengths of wire are required.

Section 4: **YES**. This is for the following reason: At the root, the (6, 5) aspect ratio had been deemed redundant, as it was covered by the (5, 5) aspect-ratio block. But when an aspect ratio of 1 is undesirable, the second choice in terms of area would have been the (6, 5) block which was omitted.

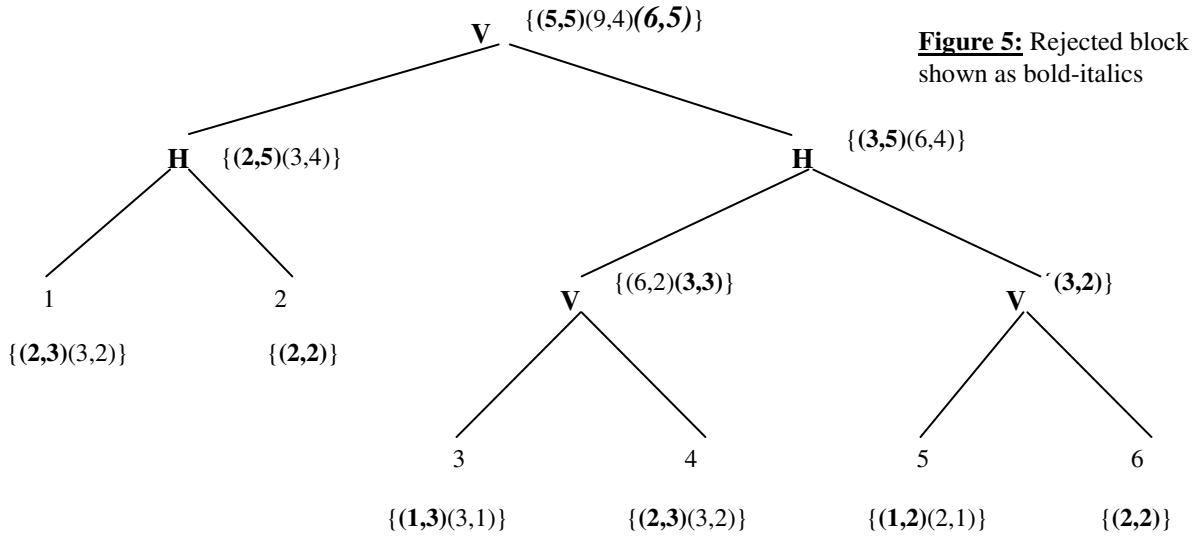
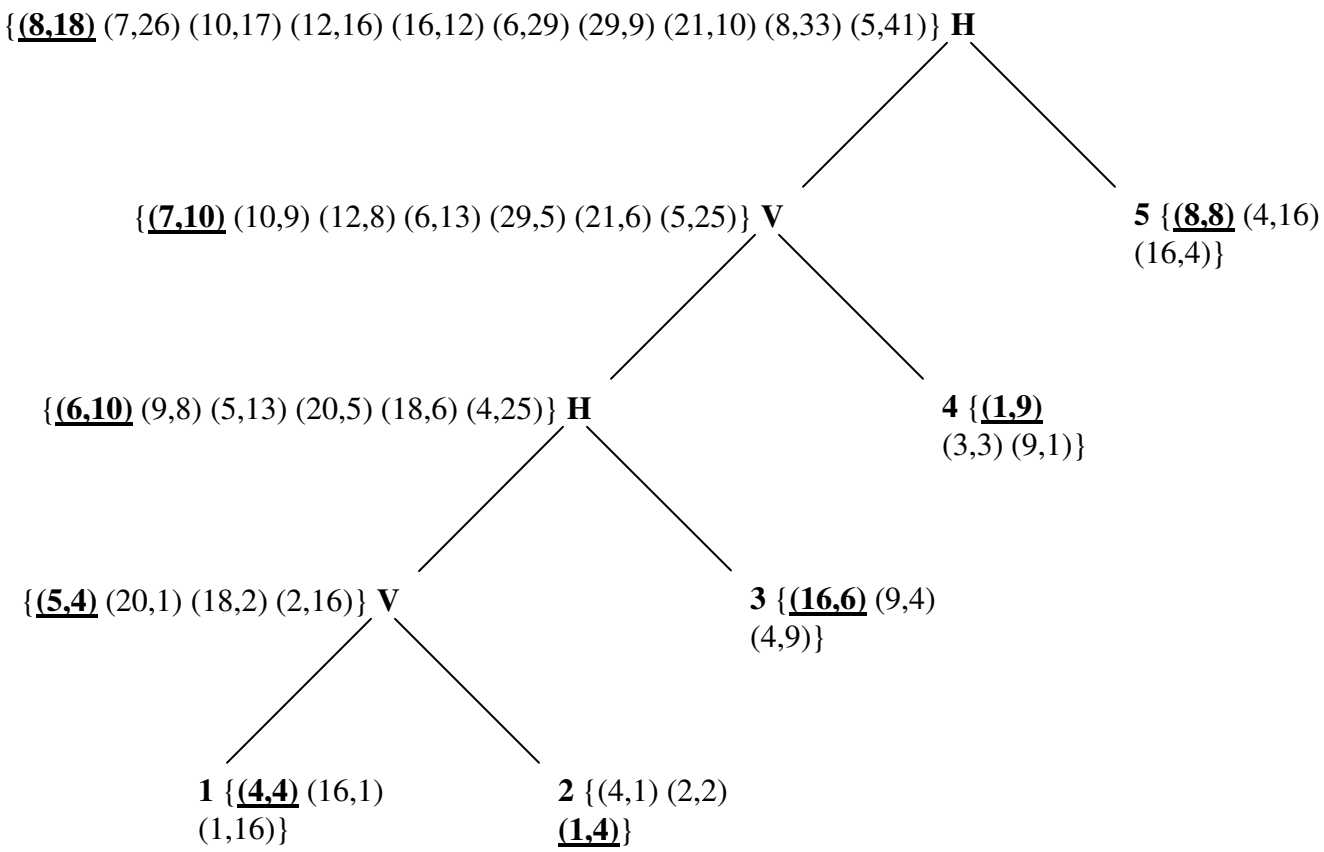


Figure 5: Rejected block shown as bold-italics

Answer 2: For the Normalized Polish Expression: 12V3H4V5H, we get the following tree:



For this tree, the minimum area bounding box would have the **dimensions (8, 18)**, and with **Area = 144 sq. units**. In the diagram above, Aspect ratios of the elements that yield the minimum area are identified in **(bold underlined brackets)**