A STUDY OF SUM OF DIVISOR FUNCTION AND STIRLING
NUMBER OF THE FIRST KIND DERIVED FROM LIOVILLE
FUNCTIONS

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It $d$ is positive integer, the *Liouville function* denoted by $\lambda(d)$ is defined as

\[
\lambda(d) = \begin{cases} 
1 & \text{if } d = 1, \\
(-1)^l & \text{if } d = p_1^{s_1} \cdots p_r^{s_r} \text{ and } s_1 + \cdots + s_r = l,
\end{cases}
\]

We know the arithmetic function $\sigma_k(n)$ defined for all $k \in \mathbb{Z}$ by

\[
\sigma_k(n) := \sum_{\substack{d \mid n \in \mathbb{N}}} d^k.
\]

In this paper, instead of $\sigma_k(n)$ we study the arithmetic function $S_k(n)$ that we define as follows

\[
S_k(n) := \sum_{\substack{n \in \mathbb{N} \atop d \mid n}} \lambda(d) d^k.
\]

Moreover, we study stirling number of the first kind derived from Lioville functions.