Thoughts on Branch Point

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Consider a complex function $\phi : \mathbb{C} \to \mathbb{C}$ with branch point a. Why is the function is not analytic even in the deleted neighborhood $\mathbb{C} - \{a\}$.

Recall that if every is "good", that is no branch point, pole..... The loop integral is independent of the loop chosen. So if there is a branch point, and the loop don't encircle the branch point, the value will be vanishing. But if it does encircle the branch point, it will be multi-valued map, which is not acceptable.

So even in the deleted neighborhood $\mathbb{C} - \{a\}$, the function won't be analytic, therefore we must introduce branch cut.

There must be a topological reason to this, need further investigation.