

```
import pandas as pd
import numpy as np
input_csv = r"C:\Users\aaayus\Downloads\netlist (1).csv"
output_csv = r"C:\Users\aaayus\Downloads\traced_paths_output.csv"
df = pd.read_csv(input_csv)
net_delay =
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int(row["net No.]): row["delay"] for _, row in df.iterrows()
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paths =
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```
def to_int(x):
    if isinstance(x, np.generic):
        x = x.item()
    if isinstance(x, float):
        return int(x)
    return x
def trace_net(net, current_path, primary_num):
    net = to_int(net)
    row = df[df["net No."] == net]
    if row.empty:
        return
    row = row.iloc[0]
    current_path.append(net)
    net_type = row["type"]
    if net_type == "inpt":
        paths.append([to_int(primary_num)] + current_path)
        return
    elif net_type == "from":
        next_net = row["fanout"]
        trace_net(next_net, current_path, primary_num)
    elif net_type in ["nand", "nor", "and", "or", "xor", "xnor"]:
        fanin1 = row["fanin1"]
        fanin2 = row["fanin2"]
        trace_net(fanin1, current_path.copy(), primary_num)
        trace_net(fanin2, current_path.copy(), primary_num)
    elif net_type == "not":
        fanin1 = row["fanin1"]
        trace_net(fanin1, current_path.copy(), primary_num)
    else:
        return
    for idx, row in df.iterrows():
        if row["fanout"] == 0:
            primary_number = row["net No."]
            trace_net(row["fanin1"],
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, primary_number)
trace_net(row["fanin2"],
```

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, primary_number)
output_rows =
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frequencies =
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print("Traced paths with total delays and frequencies:")
for path in paths:
    total_delay = 0
    for net in path:
        total_delay += net_delay.get(net, 0)
    frequency = 1 / total_delay if total_delay != 0 else 0
    frequencies.append(frequency)
    print(f"
```

```
path
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-
```

{total\_delay}

```
-
```

{frequency:.4f}

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")
output_rows.append(
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path,
"Total Delay": total_delay,
"Frequency": round(frequency, 4)
```

```
)
if frequencies:
    non_zero_frequencies =
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f for f in frequencies if f > 0

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non_zero_frequencies:
lowest_frequency = min(non_zero_frequencies)
summary_text = f"maximum possible frequency for this circuit is:
```

```
True
False
).4f
```

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Hz"
else:
    summary_text = "No non-zero frequency computed."
else:
    summary_text = "No valid paths were traced."
    print("\n" + summary_text)
    output_df = pd.DataFrame(output_rows)
    summary_row = pd.DataFrame(
```

```
[summary_text],
"Total Delay": [""],
"Frequency": [""]
```

```
)
output_df = pd.concat([output_df, summary_row], ignore_index=True)
output_df.to_csv(output_csv, index=False)
print(f"\nOutput saved to
```

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output_csv
```

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)
```