Discipline

Activity

CS5003

Activity 4

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❖ Problem Statement:

Device a mechanism to make inference from speed vs/ core expression You have to write a code (Any language you prefer) that should simulate the behaviour of serial and parallel processing relationship with cores of processing unit i.e., CPU.

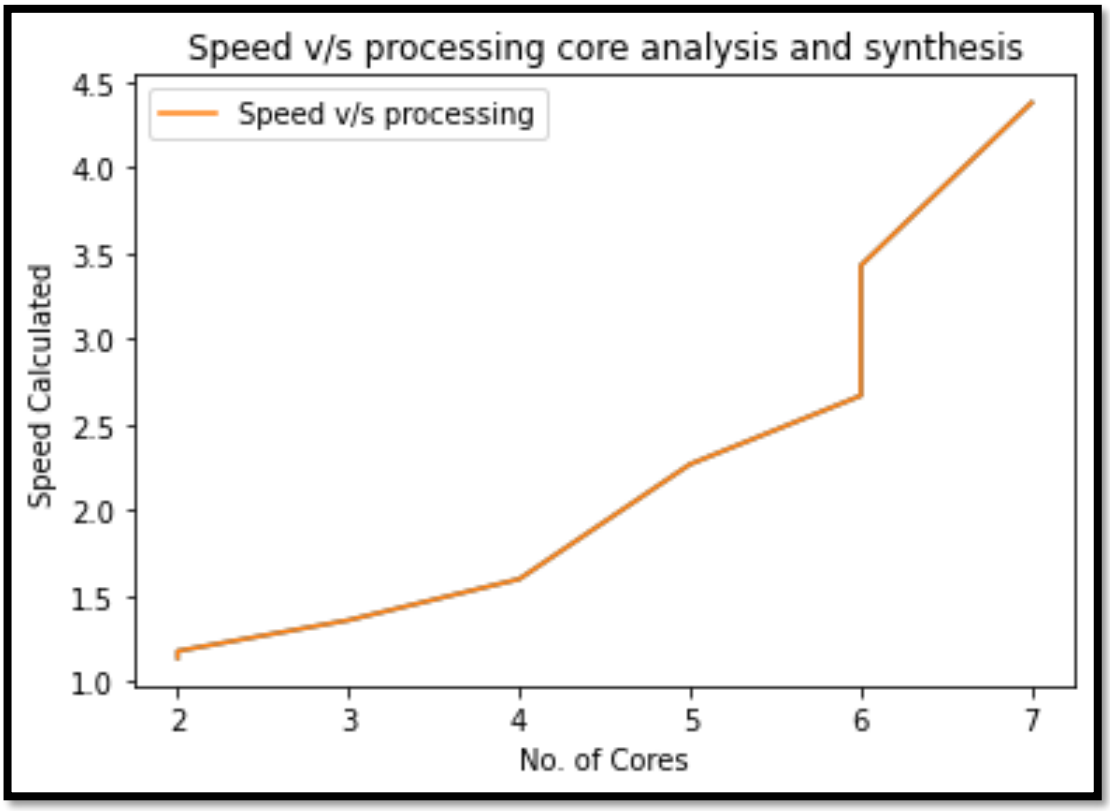
❖ Solution:

➢ Code:

```
#importing the required module
import matplotlib.pyplot as plt
from array import *

#defining arrays to store no. of cores and speed
performance=array('f',[])
core=[]

n = int(input("Please Enter the number of times you want to
check: "))

for i in range(n):
    #taking user value of parallel process proportion
    p = int(input("Enter the value of Proportion of parallel
process:- "))

    #displaying series process proportion
    print("Proportion of series process:- ",100-p,"%")

    #taking user value of no. of cores
    c = int(input(" Enter number of cores:- "))
    P = p/100

    #calculating the speed from the user taken values
    speed =round(1/((1-P)+(P/c)),2)

    #Storing calculated speed and cores in the created array
    performance.append(speed)
    core.append(c)

    #printing the calculated speed
    print("Speed comes out to be: ",speed)

#printing the arrays
print(performance)
print(core)

#plotting the graph based on the arrays having stored value
plt.plot(core, performance)
plt.xlabel('No. of Cores')
plt.ylabel('Speed Calculated')
plt.title('Speed v/s processing core analysis and synthesis')
```

```
plt.plot(core, performance, label = "Speed v/s processing")
plt.legend()
plt.show()
```

- **Output:**



- **Inference:**

I have considered three cases with different variations for better results:

1) Taking the first case when we keep on increasing the no. of cores as well as increased the proportion of parallel process and decreased the proportion of series process the speed performance increases.

2) Taking the second case when we keep on increasing the no. of cores, the performance decreases with increase in proportion of Series process and decrease in proportion of parallel process.

3) Taking the third case when we kept the no. of cores as to be constant the performance/speed increases with increase in proportion of parallel process and decrease in proportion of series process.

So, we can conclude that, testing all the condition and from their inference we can say that, increasing or decreasing the no. of cores doesn't only effect on speed but it also depends on the proportion of parallel process but not on the series proportion so we can say that

Speed of Process α Proportion of parallel process
Speed of Process α No. of CPU Cores

With increase/decrease in proportion of series process the speed or performance gets effected irrespective of the no. of cores present. Thus, in order to achieve higher performance parallel utilization should be more and no. of cores should be high.

Secondly, if we want to maximize the performance of parallel processes, the number of processes running concurrently should equal the number of processors times the number of cores on each processor. In our case, two. Any less than we have cores sitting idle not doing anything, any more, we have processes sitting idle waiting for time on a processor core.