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Part Two

a. Achieving 32 story points in 45 man days implies a focus factor of 71% (32/45). Adding two additional team members (one at 80% capacity) adds 15 days and 12 days, respectively, for a total of 72 man days for the next sprint. Assuming the focus factor holds steady at 71%, we can expect a velocity of 51 story points.

b. The definition of "new" matters here. If the team is new to solving the given problem (i.e. little to no domain expertise), then I would estimate a <50% focus factor.

   If the team is new people (i.e. new hires to a company) but they are experienced, I would estimate the focus factor to stay around 80% with the detriments of a new environment, not knowing systems, etc. counterbalanced by the usual eagerness of new employees to make a good first impression.

   If the team is new from an existing pool of employees coming together as a group for the first time, I would estimate a higher focus factor (>80%) given eagerness to demonstrate competence with a new manager.

   In all of these scenarios, I am qualitatively estimating the focus factor based on personal experience managing teams versus a tested quantitative approach, like poker.

c. Another way to estimate story points would be to ask everyone on the team whether anyone has worked on a similar problem before. If so, they could estimate the story points based on their previous experience. This is advantageous to poker because it filters out answers from those who may have no experience in the problem at hand. The disadvantage is that it gives a lot of power to one person to decide the weight of a task.

d. See diagrams below

e. See attached code

f. See diagrams below

g. See attached code

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BinTree

- root: Node

+ insertNode(thisNode: Node, data: int)

Node

+ data: int
+ leftChild: Node
+ rightChild: Node
+ leaf: boolean

0..*

insertNode is a recursive method that traverses the binary tree in order to add a Node based on the value of data, which becomes Node.data once the position for the new Node is found and created/inserted.

EmployeeRecords

- first: EmployeeNode

+ addEmployee(name: String, SSnum: int, salary: int)

The creation of a new Employee only happens when a new EmployeeNode is created, which includes the creation of a reference to the next item in the linked list. Therefore, we are presuming that this employee data does not exist outside of this linked list's existence.

0..*

EmployeeNode

- e: Employee
- next: EmployeeNode

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Employee

- name: String
- SSnum: int
- salary: int