Assignment No. 05

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| -4 | COURSE: MSO DOAT PART 1 2020-21 (SEM 1) |
| rii ife in | NAME: Hemant Vijay Hatankan |
| 01-64-21 | EMAIL: ID: hemanthatantor @ gma3/.com. |
| | MOBILE. NO: 9594917710 |
| - · · · | A STATE OF THE PARTY OF THE PAR |
| 1> | Two dice are rolled, find the probability that the sum |
| 3 | 18; and the second of the second |
| 1 | 1. equal to 1 |
| viines ! | 2 equal to 4 |
| | 3. /less than 18 " " " " " " " " " " " " " " " " " " |
| \Rightarrow | Two dice are thrown hersen with many that it |
| าร์ดาก | n(s) = 36 de si manda de manda de la compania del compania de la compania de la compania del compania de la compania del compania de la compania de la compania del compan |
| crimine TE | (ax equal to Inine otel muda a la overtado |
| a 727 | Probability that the sum is topual to 1 is Zero |
| 52 20 | - because they start with (1,1) likewise . other |
| | than in the dice we are not having zero. |
| · * - | |
| | (b) equal to 4 |
| | Event = { (1,3) (2,2) (3,1) } |
| | :. n (Event) = 3 |
| | |
| | :. P(Event) = n(Event) = 3 = 1/ = 0.08 n(3) 36 /12 |
| | n(3) 36 /12 |
| | |
| | (c) sum is less than 13. |
| | Event = 9 |
| | : Here, the total sample space will come. |
| | ~ (B) = 36/96 = 1 r(Event) = 36 |
| | |
| | ": P(Event) = n(Event) = 36=1. |
| | 7 (3) 36 |
| | p(Pvent) = 1 |
| | |

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| In the game of snakes and ladders, a fair die is thrown. |
| If event El represents all the events of getting a natural. |
| number 1000 than 4, event E2 consists of all the events |
| of getting an even number and E3 denotes all the |
| events of getting an odd number. List the sets represen |
| nating the following: |
| (i) Et or ET or Eg et et |
| (ii) Et and E2 and E8 |
| Kiii) El but not E3 |
| let consider |
| fair die is thrown, - restal as a de grand |
| 8={1,62,3,4,5,6} |
| n(s) = 6 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 |
| a second to the second of the second of the |
| (i) Et: Getting a natural number less than 4 |
| E1 = { 1,2,3} |
| material and a second of the state of the second of the se |
| Air E2: Cretting Even nuber |
| E2 = 2,4,63 = 1 = 1 |
| was a second shipping a second shipping a pione of a second second |
| ES = { 1,3,53 |
| ES = [1 3 : 5 ?] |
| |

: As per given requirements!

P & 1 X

(1) ET OF ET GO ES = ET N ET N E3

= 11,2,33 - 0 {2,4,63 0 {1,3,53 = {1,2,3,4,5,6}

(ii) Et and ED and E3 = ELN ED E3

= {1,2,33 m {2,4,64 n {1,3,53

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| 71 544 B | tony E1 but not Eg |
| rudo: | - it is to the to the to the town it is to the town in |
| -17-980 | = 112,39/1-1.3,53 |
| 8 : | " on and the following the same and the property of |
| The control of | - di di modornia aprenti positivo de plano |
| , , | and a comment of a property of the printy |
| (e) | How many permutations of the letters of the word |
| | ARTICLE have consonants in the first and last |
| | positions? |
| \Rightarrow | In the word ARTICLE, there are Li consonants. |
| | Since the first letter must be a consonant, we have |
| | four choices for the first position, and once we |
| | use up a consonant, there are only three consonants |
| · i | left for the last spot. We show as Follows: |
| - | 4 -3 1 1 2 13 (i) |
| * | 3 |
| | since there are no more restrictions, we can go |
| | ahead and make the choice for the nest of the |
| | positions. so for we have used up 21 etters, therefore, |
| | Five remain - 80 for the next position there are Five |
| | choices , for the position after that their aire four |
| | croices and so on, we get. |
| | |
| | 4 5 4/23, 2, 1 3, 2 4 |
| | 30 10 10 10 10 10 10 10 10 10 10 10 10 10 |
| | 30 the total permutations one HXZXHXXXXXXXXX |
| | = 1440 |
| | |
| Q.4 | Crive Five letters & A, B, C, D, E& Find the Following. |
| | 1. The number of four letter word sequences. |

The number of three-letter word

8. The number of two-letter

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| \Rightarrow | (16 The number of four - letter word requerce |
|---------------|--|
| · promise | to me describe the second and the same of miles to |
| | 5 4 3 2 |
| Mr. Fine | for position 1st use have 5 letters available; |
| ~ Y - | for 2rd position we have 4 letters availables |
| Stano. | 20-00 - 5 day 1 |
| | The number of four letter word sequence |
| 4 7 1 | = nPr = 5P4 = = 5! |
| eimen | E SX 4 X 3 X 2 |
| . 51 | 10 1000 15120 15120 1790 1790 1790 |
| Y 1. | and could private the and a per and made forth while |
| | (2) The number of three-letter word enquence. |
| LAB X | |
| B | 111000001 1 -5 4 3 - 2000 14 2 0000 13 |
| | For position 1st me have 5 letters, available, for |
| | 2rd position we have u & for 3rd position we |
| # | Lave a letterg. |
| | :- The number of three-letters word sequence. |
| | = npr= 5 = 5! |
| plan. | 21 |
| | 2 60 |
| | |
| | KBY The number of two letters word sequence |
| | |
| | S 4 |
| | for position 12% we have 5 letters availables |
| . 30 1 1 | for 2rd position me have 4 letters avoidable. |
| (r) - | |
| with 1 | att and the control of the state of the stat |
| | |
| | = 20 |
| | |
| | |
| | |

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| (2) | In how many different ways can I people be seated |
| | in a straight line if two of them insist on sitting |
| | next to each others. |
| \rightarrow | Lettus suppose ue hour four people A, B, CfD. Rusthan |
| 1.00 | Suppose that A & B want to sit to gliether. For the |
| | sake of aggument, we tie A and B together of treat |
| 35- | them as one person. |
| | The four people are ABCD, Since AB is treated as |
| | One person, we have the following possible amangments. |
| | ABCD, ABDC, CABD, DABC, CDAB, DCAB |
| | Note that there are say more such premutations because |
| | A and B could also be tied in the order BA . And they are |
| | BACD, BADC, CBAD, DBAC, CDBA, DCBA |
| | So altoghether there are 12 different permentations. |
| + 1 | After we tie two of the people together and break |
| . ,50 | them as one person, we can say we have only three |
| | people. |
| | 3-Par - 3-Par - 3-Par - 3-10- 3-3-1- |
| - | (3-8)% |
| | : Since teno people can be tied tegether 21 mays |
| | they are $2P2 = 21 = 21$ $(2-2)1$ |
| | (2-2)! |
| | Total different amongment anser |
| | = 31.21 |
| | = 12 |
| | who will and the sund of the manyon of |
| (6) | You have it math books and 5 History books to put on |
| | a shelf that has 5 slots. In how many many can the |
| | books be shelved if the First three slots are filled with |
| | readth books and the next two slots are filled with |
| | history books? |
| | |
| | |

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| → | Since the math books go in the Priost three slots, |
|--|--|
| 4 | there are 4 choices for the First slot, 3 choices for |
| , mara. | |
| | i.c. 4 x 3 x2 og |
| | 11.= HP3 + 1 |
| A 41 7 | a mile tradition of them a to making a gift them is the first of |
| - 6.1 | The fourth slot requires a history book and has five |
| 3.21.12. | choices. Once that choice is made, there are 11 history |
| 20.5-1 | books left, and therefore, 4 choices for the last slot. |
| | i.e s. xy ii comment of the |
| 3 | = 5P2 = 5X4 |
| 16 | 17 man a value a value and a constitution of the constitution of t |
| Carl Sel | Company of the state of the sta |
| Himme. | :. No of wand books can be shelved |
| | / ===: 41- x 5 x 4 |
| | = 3480: (1) 7 minus of wells from 1 |
| Ŋ. | |
| くなり | The shopping mall has a straight room of I flagptoles |
| a ^h . | as its main enterance place. It has 3 identical green |
| - / /· | Alogs and 2 identical yellow flogs. How many distinct |
| 110 | amongements of flags on the flagpoles are possible |
| \Rightarrow | The shopping mall has a streatight now of 5 |
| | Hagpoleg. That is arriangement 5 Flagg, where |
| . +1 | 3 Hadd are Similar of the remaining - letters |
| 4 | Flags are similar. |
| la de la companya della companya del | |
| ings | Distinct amongaments of flags = 5 P5 |
| My Car - 1 - | i et lle attimatement ami i sumbish as 3,2, is |
| - | 3121 |
| - | 3/2/ |
| | : Disdirct amangaments of flags, =10. |
| | |
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| 187 | A Birthday problem (Collision of Birth Days): |
|---------------|---|
| . + (7) | " It there are in peoble in a woom i what is the |
| | chance that some pair among them have the same |
| | bfr th day?" so were so |
| \Rightarrow | The problem is to produce compute an expensionate |
| . / | probability that in a group of n people at least two have the |
| my st | some birthday. For 81 mplicity, vomations in distinibution |
| Wy · · | such as leap years, twing, seasonal ar weekly womations |
| .40 | are discregare ded and it is assumed that all 865 possible |
| | birthdays are equally likely. |
| | The goal is to compute P(A), the probability that at least |
| | two people Pr the room hove the same birthday. However |
| | it is simpler to calculate P(A'), the probability that to two |
| | people in the room have the same birthday, Then because |
| | A and A' are the only two possi bilities and are also |
| | mutually exclusive P(A)=1-A(A') |
| | |
| r | |
| · VA83 | According to the pigeon hole principle, P(n) is rero |
| | when n > 365: When n < 865: |
| | inten n > 365: When n < 865: |
| | when In > 365. When, n < 865:36. |
| | $\frac{1}{2}(0) = 362 \times 367 \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ |
| | $\frac{1}{2}(0) = 362 \times 367 \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ |
| -4:0 | $b(u) = 3e2f' = 2f' (3e2) = 3e2 bu$ $b(u) = 3e2 \times 3e4 \times \times (3e2-u+1)$ $b(u) = 1 \times (1-1) \times (1-2) \times \times (1-u-1)$ $chec u > 3e2 : Mreu u < 3e2 :$ |
| -4:0 | $\frac{1}{2}(0) = 362 \times 367 \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ $\frac{1}{2}(0) = 1 \times (1-1) \times \times (362-41)$ |
| -4:0 | $b(u) = 3e2f' = 2f' (3e2) = 3e2 bu$ $b(u) = 3e2 \times 3e4 \times \times (3e2-u+1)$ $b(u) = 1 \times (1-1) \times (1-2) \times \times (1-u-1)$ $chec u > 3e2 : Mreu u < 3e2 :$ |
| -4:0 | $362_{\mu}(362-\mu)! \qquad 362_{\mu} \qquad 362_{\mu}$ $b(\mu) = 362 \times 364 \times \dots \times (362-\mu+1)$ $b(\mu) = 362 \times 364 \times \dots \times (362-\mu+1)$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu}$ |
| -4:0 | The event of at teast the of the n persons howing The event of at teast the of the n persons howing |
| -4:0 | $362_{\mu}(362-\mu)! \qquad 362_{\mu} \qquad 362_{\mu}$ $b(\mu) = 362 \times 364 \times \dots \times (362-\mu+1)$ $b(\mu) = 362 \times 364 \times \dots \times (362-\mu+1)$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu} \times 362_{\mu} \times 362_{\mu}$ $b(\mu) = 362_{\mu} \times 362_{\mu}$ |
| -4:0 | when n > 365. When n < 365. \$(n) = 1 x (1-1) x. (1-2) x x (1-n-1) \$(f) = 365 x 364 x x (365-n+1) \$(g) = 365 x 364 x x (365 n-1) \$(g) = 365 x 364 x x (365 n-1) \$(g) = 365 pn \$(g) = 1 x (1-1) x (1-2) x x (1-n-1) The event of at least two of the n persons howing the same bisthday is complementary to all n bisthday's being different. |
| -4:0 | when n > set. When n < set: \$\beta(n) = 1 \times \begin{array}{c} \lambda \la |
| -4:0 | when n > 365. When n < 365. \$(n) = 1 x (1-1) x. (1-2) x x (1-n-1) \$(f) = 365 x 364 x x (365-n+1) \$(g) = 365 x 364 x x (365 n-1) \$(g) = 365 x 364 x x (365 n-1) \$(g) = 365 pn \$(g) = 1 x (1-1) x (1-2) x x (1-n-1) The event of at least two of the n persons howing the same bisthday is complementary to all n bisthday's being different. |

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| 19) | You have a fair, well shuffled deck of 52 cards It consists |
|---------|---|
| | of four suits. The suits are clibs, diamonds, hearts & |
| | spaces. There are 13 courds in each suit consisting of \$, |
| | 1,2,3,4,5,6,7,8,9,J (Joich), Q(Queen), H (Wing) of that |
| | zuf. |
| | Three consider and picked of mondom. |
| | (a) Suppose you know that the picked acreds are Q of |
| | spades, k of hearts and Q of spades. Con you decide |
| | if the sampling was with one without replacement? |
| | (b) Suppose you know that the picked cords are Q of |
| | spades, K of hearts and J of spodes, con you decide if |
| | the sampling was with or without replacement? |
| 70. 3 | (a) |
| | Three cord etopiched = (50, HK, 503 |
| | so in this enevert so repeated unile picking. |
| | the coreds. |
| | Herce, we can deside that sampling was with |
| | replacement. |
| | Light gray of the property and the first in the |
| | Lby Three card picked = { 50, HK, 57} |
| | So in this evert not single card repeated in |
| | sample. But we can not be sured whether |
| 4 | gome is selected with replacement or without. |
| | replacement. con' not decide on method type. |
| | |
| (10) | You have a fair, well shuffled deck of 52 cords. It |
| | consists of four suity. The suits are clubs, diamonds, |
| | hearty, and spaces. There are 13 cords in each suit |
| | consisting of 1,2,3,4,5,6,7,8,9,10, I(Jack), Q(Queen), |
| | H(king) of that suit, S= spades, H= Hearts, D=Diamonds |
| | C= clubs, suppose that you sample four cards inithout |
| | replacement. Which of the following out comes are possible |
| | - C passing |
| White I | |

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| 244 Hos 1 | Answer the Following questions for sampling with |
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| 2. 7 | troeplacement it is an all - the |
| | (a) QS 10, 10, 00 |
| 7-14 | LBY KH, TD, 6D, KH / HOLE TO THE DELLE STATE |
| | 1c/ QS, 7D, 6D, KS |
| \Rightarrow | (a) Q9, 1D, 1C, QD |
| 50 pt | - ANAte claverts of set are unique. |
| . Almain | Without Replacement is possible |
| 7. 4 | With replacementaria also possible |
| | - stores barbins of part word one sonant with |
| 7 3 6 100 | Lby KH, 7D,060, FH |
| - 4 | All the elements of set are not unique |
| | :. Without replacement is Not possible (impossible) |
| | I with replacement is possible. |
| soldies. | The I steem to the desired with the state of |
| | LCY Q3, 1D, 1C, QD |
| | All the elements of set one unique |
| | |
| ~ / t· l | |
| | : Without Replacement is possible. |
| | |
| | :: With replacement is possible. |
| | :: With replacement is possible. |
| | : With replacement is possible. : With replacement is possible. |
| | ": With replacement is possible. With replacement is possible. Living in the service of the service o |
| - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | : With replacement is possible. : With replacement is possible. |
| - 1 1 m l n | 1. With replacement is possible. |
| 30.00 | ": With replacement is possible. With replacement is possible. Living in the service of the service o |
| | 1. With replacement is possible. |
| July of | 1. With replacement is possible. |
| July of | 1. With replacement is possible. |
| Love of | Litthout Replacement is possible. I with replacement is possible. I with replacement is possible. I will be a superior to the superior to t |
| Live of thomas of | ** With replacement is possible. I with replacement is possible. I will replacement is possible. |
| Luc of the state o | Litthout Replacement is possible. I with replacement is possible. I with replacement is possible. I will be a superior to the superior to t |