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ST2334	**ST2334**	Topics ?> Probability ?> Sampling	29/01/2022		
ST2334	**Probability**	Topics ?> Basics_Of_Probability ?> Counting ?> Random_Variable	29/01/2022		
ST2334	**Basics Of Probability**	Topics ?> Sampling__P_ ?> Event__P_ ?> Axioms_Of_Probability	29/01/2022		
ST2334	**Axioms Of Probability**	Properties > $P(\varnothing)=0$ > If A_1 A_2 are /Mutually_Exclusive_Event $\Longrightarrow$ P can be summed up > $P(A')=1-P(A)$ > $P(A)=P(A\cap B)+P(A\cap B')$?> Inclusion_Exclusion_Principle > $A\subseteq B \Longrightarrow P(A)\leq P(B)$?> Multiplication_Rule_Of_Probability ?> Bayes_Theorem ?> Law_Of_Total_Probability	29/01/2022		
ST2334	**Counting**	Topics ?> Multiplication_Principle ?> Addition_Principle	29/01/2022		
ST2334	**Sampling (P)**	Topics ?> Sample_Space ?> Sample_Point ?> Sampling_Distribution	29/01/2022		
ST2334	**Sample Space**	Definition > The set of all possible outcomes of a statistical experiment ><MA S MA>	29/01/2022		
ST2334	**Sample Point**	Definition > One possible outcome of a statistical experiment	29/01/2022		
ST2334	**Event (P)**	Definition > Subset of the /Sample_Space > AKA Outcome Topics ?> Relative_Frequency Types ?> Simple_Event ?> Compound_Event ?> Sure_Event ?> Null_Event ?> Complement_Event ?> Mutually_Exclusive_Events ?> Exhaustive_Events ?> Independent_Events ?> Equivalent_Events	29/01/2022		
ST2334	**Independent Events**	Definition > A and B independent $\Leftrightarrow P(A\cap B)=P(A)P(B)$ > Cannot be shown in Venn Diagram Properties > $P(B\|A)=P(B)$ > CANNOT be /Mutually_Exclusive_Events ::A and B independent > A and B' independent > A' and B independent > A' and B' independent Types ?> Pairwise_Independent_Events ?> Mutually_Independent_Events	29/01/2022		
ST2334	**Pairwise Independent Events**	Definition > $A_1,A_2,...A_\square$ pairwise independent $\Leftrightarrow P(A_\square)P(A_\square)$ > Mutually Independent $\Longrightarrow$ Pairwise Independent	29/01/2022		
ST2334	**Mutually Independent Events**	Definition > $A_1,A_2,...A_\square$ mutually independent $\Leftrightarrow$ any subset: $P(A_1\cap A_2\cap...A_\square)=P(A_1)...P(A_\square)$ > AKA independent	29/01/2022		
ST2334	**Mutually Exclusive Events**	Definition > Events that cannot happen together Usage > Counting can use /Addition_Principle > Probabilty can sum up Properties > $P(A\cap B)=0$ > CANNOT be /Independent_Events	29/01/2022		
ST2334	**Exhaustive Events**	Definition > Events that make up the entire /Sample_Space	29/01/2022		
ST2334	**Partition (P)**	Definition > The sample space is split up into events, and nothing is left over Topics ?> Exhaustive_Events ?> Mutually_Exclusive_Events	29/01/2022		
ST2334	**Simple Event**	Definition > Event only has one /Sample_Point	29/01/2022		
ST2334	**Compound Event**	Definition > Event has more than one /Sample_Point	29/01/2022		
ST2334	**Sure Event**	Definition > Event space covers whole /Sample_Space	29/01/2022		
ST2334	**Null Event**	Definition > Event space is empty	29/01/2022		

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ST2334	**Complement Event**	Definition > The opposite of an Event	29/01/2022		
ST2334	**Relative Frequency**	Definition > Can be used to derive probability of an event Usage <MA Observed/Total MA>	29/01/2022		
ST2334	**Multiplication Principle**	Definition > Procedures can be performed in succession <MA n_1n_2 MA> Types ?> Generalised_Multiplication_Principle	29/01/2022		
ST2334	**Generalised Multiplication Principle**	Definition <MA $n_1n_2n_3...n_\square$ MA>	29/01/2022		
ST2334	**Addition Principle**	Definition > Procedures cannot be performed together <MA n_1+n_2 MA> Types ?> Generalised_Addition_Principle	29/01/2022		
ST2334	**Generalised Addition Principle**	Definition <MA $n_1n_2n_3...n_\square$ MA>	29/01/2022		
ST2334	**Multiplication Rule Of Probability**	Definition <MA $P(A \cap B \cap C) = P(A)P(B\|A)P(C\|A \cap B)$ MA> <MA $P(A_1 \cap A_2 \cap ... \cap A_\square) = P(A_1)P(A_2\|A_1)...P(A_\square\|A_1 \cap A_2 \cap ...)$ MA>	29/01/2022		488
ST2334	**Bayes Theorem**	Definition > $A_1,A_2,...A_\square$ partition of $S \implies$ <MA $P(A_\square\|B)=P(A_\square)P(B\|A_\square)/\sum P(B \cap A_\square)$ MA>	29/01/2022	Important	
ST2334	**Law Of Total Probability**	Definition > $A_1, A_2,...A_\square$ is a partition of $S \implies P(B)=\sum(P(B \cap A_\square))$ > Pizza, but you cut up an inner circle like a madman Topics ?> Partition__P_	29/01/2022		
ST2334	**Random Variable**	Definition > A variable that takes on a range of values Topics ?> Functions__P_ ?> Expectation ?> Random_Variable__2D_ Types ?> Discrete_Random_Variable ?> Continuous_Random_Variable	05/03/2022		
ST2334	**Discrete Random Variable**	Definition > /Population is /Countably_Infinite	05/03/2022		
ST2334	**Continuous Random Variable**	Definition > /Population is not /Countably_Infinite > /Range_Space is an interval or collection of intervals	05/03/2022		
ST2334	**Functions (P)**	Definition > X(s) for an element in sample space Topics ?> Range_Space Types ?> Real_Valued_Function ?> Probability_Function	05/03/2022		
ST2334	**Probability Function**	Definition > The function $f(x)$ that describes the probability distribution of a random variable > Can be used to describe proportions in the populations <MA $f(x) \geq 0$ MA> Topics ?> Probability_Distribution Types ?> Probability_Mass_Function ?> Probabililty_Density_Function ?> Cumulative_Distribution_Function	05/03/2022		
ST2334	**Probability Distribution**	Definition > Describes how the random variables are spread > The set of points $(x, f(x))$ describe the distribution Types ?> Special_Probability_Distribution	05/03/2022		
ST2334	**Probability Mass Function**	Definition > Possible values are discrete > Probabilities are computed by summation > $P(X=x) = f(x)$ > $\sum f(x) = 1$	05/03/2022		
ST2334	**Probability Density Function**	Definition > Possible values are continuous > Probabilities are computed by integrating <MA $P(x<X<x+\delta x) = f(x)\delta x$ MA> <MA $\int f(x)dx = 1$ MA> Properties <MA $P(X=x) = 0$ MA> > $A=\varnothing \implies P(A)=0$, but not the converse Types ?> Legitimate_Probability_Density_Function ?> Normal_Distribution	05/03/2022		

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ST2334	**Cumulative Distribution Function**	Definition <MA $F(x) = P(X \leq x)$ MA> <MA $P(a \leq x \leq b) = F(b) - F(a)$ MA> <MA $f(x) = d/dx(F(x))$ MA> for /Probability_Mass_Function	05/03/2022		
ST2334	**Legitimate Probabiltity Density Function**	Proof ::Prove that pdf is valid > Just check $f(x) \geq 0$ and $\int f(x)dx = 1$	05/03/2022		
ST2334	**Equivalent Events**	Definition > Events that mean the same thing > $A = \{s \in S \mid X(s) \in B\} \implies P(A) = P(B)$	05/03/2022		
ST2334	**Real Valued Function**	Definition > Sample and range space are real	05/03/2022		
ST2334	**Range Space**	Definition > The set of possible values of the random variable X	05/03/2022		
ST2334	**Expectation**	Definition <MA $E(X) = \sum x f(x) = \int x f(x)dx$ MA> Types ?> Variance ?> Kth_Moment_Of_X ?> Expectation__2D_	06/03/2022		
ST2334	**Kth Moment Of X**	Definition <MA $E(X^{\square})$ is the kth moment of X MA>	06/03/2022		
ST2334	**Variance**	Definition <MA $Var(X) = E((X-E(X))^2) = E(X^2)-(E(X))^2 = \sum (x-E(X))^2 f(x) = E((X-E(X))^2$ MA> Properties <MA $V(aX+bY) = a^2V(X)+b^2V(Y)$ MA> Topics ?> Chebyshev_Inequality ?> Covariance	11/02/2022		514
ST2334	**Chebyshev Inequality**	Definition <MA $P(\lvert X-\mu \rvert \geq c) \leq Var(X)/c^2$ MA> <MA $P(\lvert X-\mu \rvert < c) \geq 1 - Var(X)/c^2$ MA> <MA $P(\lvert X-\mu \rvert \geq k\sigma) \leq 1/k^2$ MA>	11/02/2022	Important	515
ST2334	**Random Variable (2D)**	Definition > We are interested in two different types of statistics ?> Random_Vector Topics ?> Probability_Function__2D_ ?> Expectation__2D_ Types ?> Discrete_Random_Variable__2D_ ?> Continuous_Random_Variable__2D_ ?> Independent_Random_Variables	06/03/2022		
ST2334	**Probability Function (2D)**	Topics ?> Range_Space__2D_ Types ?> Joint_Probability_Function ?> Marginal_Probability_Function ?> Conditional_Probability_Function	06/03/2022		
ST2334	**Range Space (2D)**	Definition > $R = \{(x,y) \mid x=X(s), y=Y(s), s \in S\}$	06/03/2022		
ST2334	**Random Vector**	Definition <MA (X,Y) MA> > Another way of representing 2D Random Variables	06/03/2022		
ST2334	**Discrete Random Variable (2D)**	Definition <MA (X,Y) MA> is a 2D discrete if the possible values of X and Y are countably infinite	06/03/2022		
ST2334	**Continuous Random Variable (2D)**	Definition <MA (X,Y) MA> is a 2D continuous if possible values of X and Y can assume all values in some region in $\mathbb{R}^2$	06/03/2022		
ST2334	**Known Variance Mean Confidence Interval**	Definition > Variance is known > $Z = (\bar{X}-\mu)/(\sigma/\sqrt{n}) \sim N(0,1)$ > $P(-z[a/2] < Z < z[a/2]) = 1-a$ > $e \geq z[a/2]\sigma/\sqrt{n} \iff n \geq (z[a/2]\sigma/e)^2$	27/03/2022		
ST2334	**Unknown Variance Mean Confidence Interval**	Definition > n is large enough > $T = (\bar{X}-\mu)/(S/\sqrt{n})$ > $P(\bar{X}-t[n-1,a/2](S/\sqrt{n}) < \mu < \bar{X}+t[n-1,a/2](S/\sqrt{n})) = 1-a$ Process ::Determine confidence interval using sample mean $\bar{x}$, sample size n, sample deviation s, value from t-distribution t* > $\bar{x} \pm t^* s/\sqrt{n}$	27/03/2022		
ST2334	**Known Variance Mean Difference Hypothesis Testing**	Definition > Variance is known > $Z = ((\bar{X}-\mu)_1 - (\bar{X}-\mu)_2)/\sqrt{((\sigma^2/n)_1 + (\sigma^2/n)_2)} \sim N(0,1)$	03/04/2022		
ST2334	**Unknown Variance Mean Difference Hypothesis Testing**	Definition > n is large enough > $T = ((\bar{X}-\mu)_1 - (\bar{X}-\mu)_2)/\sqrt{((s^2/n)_1 + (s^2/n)_2)} \sim N(0,1)$	03/04/2022		
ST2334	**Unknown Equal Variance Mean Difference Hypothesis Testing**	Definition > Populations are normal or n is large enough > $T = ((\bar{X}-\mu)_1 - (\bar{X}-\mu)_2)/\sqrt{Sp(1/n_1 + 1/n_2)} \sim T(n_1+n_2-2)$	03/04/2022	Important	
ST2334	**Pooled Sample Variance**	Definition > $Sp^2 = ((n_1-1)s_1^2 + (n_2-1)s_2^2)/(n_1+n_2-2)$	03/04/2022	Important	

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ST2334	**Joint Probability Function**	Definition > (X,Y) is a /Discrete_Random_Variable__2D_ ⟹ $f(x,y)=P(X=x, Y=y)$ > The set of all possible points gives the /Probability_Distribution > Similar to /Joint_Rate Types ?> Discrete_Joint_Probability_Function ?> Continuous_Joint_Probability_Function	06/03/2022		
ST2334	**Discrete Joint Probability Function**	Definition > A 2D matrix representing the probabilities when X=x and Y=y Process ::Find Joint Probability Function > Find P(X=x,Y=y) > Use combinatorics to find the probability of each joint event happening > Don't add unnecessary variable Z > End up with combinatoric over combinatoric ::Find probability of an event > Find all possible sample space > Find probability of each 2D event happening	06/03/2022		
ST2334	**Continuous Joint Probability Function**	Definition > Represented the same as a /Probability_Density_Function <MA $\iint f\square\square(x,y)dxdy = 1$ MA> Process ::Find probability of an event > Integrate over the shaded region	06/03/2022		
ST2334	**Marginal Probability Function**	Definition > $f\square(x)$ = P(X=x) ⟹ how does x change for a constant y? > Represented with a column/row of values > Similar to /Marginal_Rate Types ?> Discrete_Marginal_Probability_Function ?> Continuous_Marginal_Probability_Function	06/03/2022		
ST2334	**Discrete Marginal Probability Function**	Definition <MA $f\square(x)=\sum f\square\square(x,y)$ MA> over all y <MA $f\square(y)=\sum f\square\square(x,y)$ MA> over all x ::Find Marginal Probability Function > Fix values of y > Find the probability of getting each value of x > Compute row sum or column sum	06/03/2022		
ST2334	**Continuous Marginal Probability Function**	Definition <MA $f\square(x)=\int f\square\square(x,y)dy$ MA> <MA $f\square(y)=\int f\square\square(x,y)dx$ MA>	06/03/2022		
ST2334	**Conditional Probability Function**	Definition <MA $f\square|\square(y|x) = f\square\square(x,y)/f\square(x)$ MA> > The set of all possible points gives the /Probability_Distribution > Similar to /Conditional_Rate Properties <MA $f\square\square(x,y) = f\square|\square(y|x)f\square(x)$ MA> <MA $P(Y\leq y|X=x) = \int[-\infty,y]f\square|\square(t|x)dt$ MA> <MA $E(Y|X=x) = \int[-\infty,\infty]yf\square|\square(y|x)dy$ MA> Process ::Find Conditional Probability Function > Find /Joint_Probability_Function > Find /Marginal_Probability_Function	06/03/2022		561
ST2334	**Independent Random Variables**	Definition > X and Y are independent ⟺ $f\square\square(x,y) = f\square(x)f\square(y)$ > /Range_Space must all be rectangular	06/03/2022		
ST2334	**Expectation (2D)**	Definition <MA $\sum\sum g(x,y)f(x,y)$ MA> <MA $\iint g(x,y)f(x,y)dxdy$ MA> Types ?> Covariance	06/03/2022		
ST2334	**Covariance**	Definition > X and Y independent ⟹ Cov(X,Y)=0 but not converse <MA $Cov(X,Y)=E((X-E(X))(Y-E(Y)))$ MA> <MA $Cov(X,Y)=\sigma\square,\square^2$ MA> Properties <MA $Cov(X,Y)=E(XY)-E(X)E(Y)$ MA> <MA $Cov(aX+b,cY+d)=acCov(X,Y)$ MA> <MA $Var(aX+bY) = a^2Var(X)+b^2Var(Y)+2abCov(X,Y)$ MA> Topics ?> Correlation_Coefficient	06/03/2022	Important	
ST2334	**Correlation Coefficient**	Definition <MA $\rho\square,\square=Cov(X,Y)/(\sqrt{V(X)V(Y)})$ MA> Properties <MA $-1\leq\rho\leq1$ MA>	06/03/2022		
ST2334	**Special Probability Distribution**	Types ?> Discrete_Distribution	08/03/2022		
ST2334	**Discrete Distribution**	Types ?> Discrete_Uniform_Distribution ?> Binomial_Distribution ?> Poisson_Distribution	08/03/2022		

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ST2334	**Continuous Distribution**	Types ?> Continuous_Uniform_Distribution ?> Exponential_Distribution ?> Normal_Distribution ?> Normal_Approximation	08/03/2022		
ST2334	**Discrete Uniform Distribution**	Definition > Each possible value in the sample space is equal probability > P(X=x)=1/k Properties > /Expectation :- ∑x□/k > /Variance :- ∑(x□-μ)²/k	08/03/2022		
ST2334	**Binomial Distribution**	Definition > $f(x)=(nCx)p^x(1-p)^{n-x}$ > Consists of n repeated /Bernoulli_Experiment s Properties > /Expectation :- np > /Variance :- np(1-p) Types ?> Bernoulli_Distribution ?> Negative_Binomial_Distribution ?> Poisson_Approximation ?> Normal_Approximation	08/03/2022		
ST2334	**Bernoulli Distribution**	Definition > X~B(n,p) > $f(x)=p^x(1-p)^{1-x}$, 0<p<1, x=0,1 ?> Bernoulli_Experiment Properties > /Expectation :- p > /Variance :- p(1-p)	08/03/2022		
ST2334	**Bernoulli Experiment**	Definition > Random experiment where there's only two possible outcomes success/failure	08/03/2022		
ST2334	**Negative Binomial Distribution**	Definition > Counts the number of trials x to achieve k successes > X~NB(k,p) > $f(x)=((x-1)C(k-1))p^x(1-p)^{x-□}$ Properties > /Expectation :- k/p > /Variance :- k(1-p)/p²	08/03/2022		
ST2334	**Poisson Distribution**	Definition > Number of occurrences occuring during a particular time interval > X~P(λ) > $f(x)=\exp(-λ)λ^x/x!$ Properties > /Expectation :- λ > /Variance :- λ	08/03/2022		
ST2334	**Poisson Approximation**	Definition > np=λ > n has to be big, or p is small, or both	08/03/2022		
ST2334	**Continuous Uniform Distribution**	Definition > $f(x)=1/(b-a)$ Properties > /Expectation :- (a+b)/2 > /Variance :- (b-a)²/12	08/03/2022		
ST2334	**Exponential Distribution**	Definition > $f(x)=a\exp(-ax)$ Properties > /Expectation :- 1/a > /Variance :- 1/a² > P(X>s+t|X>s)=P(X>t)	08/03/2022		
ST2334	**Normal Approximation**	Definition > μ=np, var=np(1-p) > $Z = (X-np)/\sqrt{npq}$ Topics ?> Continuity_Correction	08/03/2022		
ST2334	**Continuity Correction**	Properties > P(X=k) = P([k-½,k+½]) > Basically ½ under the lower bound, ½ over the higher bound	18/03/2022		
ST2334	**Chi Square Test**	Definition > Check whether two variables have an association Process > Find the expected rates for the experiment, based on marginal rates > Then compare them to the actual observation and find how much they differ	24/03/2022		
ST2334	**Chi Square Distribution**	Definition > $χ^2(n-1) \sim (n-1)S^2/σ^2 = ∑(X□-\bar{X})^2/σ^2$ > $χ^2(n) \sim N(n,2n)$ > $X\sim N(0,1) \implies X^2\sim χ^2(1)$ > If there are k independent $χ^2$ random variables, then summing them up will also sum up the degrees of freedom Process > CHISQ.INV(0.05;n) ⟹ P(X≤?)=0.05 > CHISQ.DIST(4;n;true) ⟹ P(X≤4)=?	27/03/2022	Important	

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ST2334	**T Distribution**	Definition > Weaker /Normal_Distribution > $Z \sim N(0,1)$, $U \sim \chi^2(n) \implies T=Z/\sqrt{(U/n)} \sim t(n)$ Properties > /Expectation :- 0 > /Variance :- $n/(n-2)$ Process > T.DIST(2,n,TRUE) $\implies$ P(T<2)=? > T.INV(0.95,n) $\implies$ P(T<?)=0.95	27/03/2022	Important	
ST2334	**F Distribution**	Definition > $U \sim \chi^2(n_1)$ and $V \sim \chi^2(n_2)$ are independent $\implies F=Un_2/Vn_1$ > $F(n_1-1,n_2-1)=S_1^2\sigma_2^2/S_2^2\sigma_1^2$ > $F \sim F(n,m) \iff 1/F \sim F(m,n)$ > $F(5,4,0.05)=6.26 \implies P(F>6.26)=0.05$ > $F(n,m,1-a)=1/F(m,n,a)$ Properties > /Expectation :- $n_2/(n_2-2)$ > /Variance :- $2n_2^2(n_1+n_2-2)/n_1(n_2-2)^2(n_2-4)$ Process > F.DIST(5,n_1,n_2,true) $\implies$ P(F≤5)=? > F.INV(0.05,n_1,n_2) $\implies$ P(F≤?)=0.05	27/03/2022	Important	
ST2334	**Sampling Distribution**	Properties > $E(\bar{X}) = E(X)$ > $V(\bar{X}) = V(X)/n$ Topics ?> Law_Of_Large_Number ?> Central_Limit_Theorem Types ?> Chi_Square_Distribution ?> T_Distribution ?> F_Distribution	26/03/2022		
ST2334	**Law Of Large Number**	Definition > $P(\lvert\bar{X}-\mu\rvert>\varepsilon) \to 0$ as $n \to \infty$	26/03/2022		
ST2334	**Central Limit Theorem**	Definition > Sampling distribution of sample means is approximately normal if n is sufficiently large $N(\mu,s^2/n)$	26/03/2022		
ST2334	**Normal Estimation**	Definition > You know the type of distribution you are working with, but don't know the exact population parameter Topics ?> Point_Estimation ?> Unbiased_Estimator ?> Biased_Estimator ?> Interval_Estimation ?> Confidence_Interval	27/03/2022		
ST2334	**Point Estimation**	Definition > θ^ is a function of the random variable > θ^(X_1,X_2...X□) is a point estimator > $\bar{X}=\mu\hat{}$ is a point estimator for μ	27/03/2022		
ST2334	**Interval Estimation**	Definition > We make estimates for the lower bound and upper bound of the interval, in terms of the X random variables > θ^L=ƒ(X_1,X_2...X□), θ^U=***g***(X_1,X_2...X□) > P(θ^L<θ<θ^U)=1-a → confidence coeff Topics ?> Confidence_Coefficient	27/03/2022		
ST2334	**Confidence Coefficient**	Definition > AKA Degree Of Confidence	27/03/2022		
ST2334	**Unbiased Estimator**	Definition > $E(\hat{\theta})=\theta \implies \hat{\theta}$ is an unbiased estimator for parameter θ Examples > $E(S^2)=\sigma^2$ > $E(\bar{X})=\mu$	27/03/2022		
ST2334	**Biased Estimator**	Definition > Does not precisely equal to the parameter is supposed to estimate, but may be equal as $n \to \infty$	27/03/2022		
ST2334	**Difference Hypothesis Testing**	Types ?> Known_Variance_Mean_Difference_Hypothesis_Testing ?> Unknown_Variance_Mean_Difference_Hypothesis_Testing ?> Unknown_Equal_Variance_Mean_Difference_Hypothesis_Testing	27/03/2022		
ST2334	**Variance Hypothesis Testing**	Definition > Means unknown > Distribution is normal > Use F distribution to find ratio of variances Usage > $\sigma_1^2>\sigma_2^2$:- F>F[n_1-1,n_2-1,a] > $\sigma_1^2<\sigma_2^2$:- F<F[n_1-1,n_2-1,1-a] > $\sigma_1^2\neq\sigma_2^2$:- F<F[n_1-1,n_2-1,1-a/2] or F>F[n_1-1,n_2-1,a/2]	27/03/2022	Important	
ST2334	**Type I Error**	Definition > Reject null hypothesis when it is true	08/04/2022		
ST2334	**Type II Error**	Definition > Accept hypothesis when it is false	08/04/2022		

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Web	**Spring Framework**	Definition > https://www.youtube.com/watch?v=VvGjZgqojMc Topics ?> Inversion_Of_Control ?> Spring_Architecture ?> Spring_Process Benefits ?> Spring_Benefits	12/03/2022		563
Web	**Spring Benefits**	Topics ?> Spring_Simplicity	12/03/2022		
Web	**Spring Process**	Types ?> Inversion_Of_Control ?> Dependency_Injection ?> Aspect_Oriented_Programming ?> Module_View_Container	13/03/2022		
Web	**Inversion Of Control**	Definition > Instead of subclass being dependent on their parent class, the parent class injects from the subclasses Process ::Configure IoC container > Input metadata in the form of xml to a POJO class > Class can be used freely in the application Types ?> Spring_Bean_Factory ?> Spring_Application_Context	12/03/2022		564
Web	**Spring Simplicity**	Definition > Non-invasive implementation of Objects and Interfaces	12/03/2022		565
Web	**Spring Architecture**	Topics ?> Spring_Framework_Ecosystem ?> Spring_Modules	13/03/2022		
Web	**Spring Framework Ecosystem**	Types ?> Spring_Web_Layer ?> Spring_Common_Layer ?> Spring_Service_Layer ?> Spring_Data_Layer	12/03/2022		566
Web	**Spring Web Layer**	Definition > Spring IO platform	12/03/2022		567
Web	**Spring Common Layer**	Definition	12/03/2022		568
Web	**Spring Service Layer**	Definition	12/03/2022		569
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Web	**Spring Modules**	Types ?> Spring_Core_Container ?> Spring_Data_Integration ?> Spring_Web ?> Spring_AOP ?> Spring_Instrumentation ?> Spring_Test	13/03/2022		571
Web	**Spring Core Container**	Definition > Basic functionality of the application > Focusses on dependency, injection and inversion of control Types ?> Spring_Beans	13/03/2022		572
Web	**Spring Data Integration**	Definition > Interacts the data layer, or connect to other frameworks like Hibernate Types ?> Spring_Transaction ?> Spring_JDBC ?> Spring_JMS ?> Spring_ORM ?> Spring_OXM	13/03/2022		573
Web	**Spring Web**	Definition > Provides basic web-oriented integration features Types ?> Spring_Web_Portlet ?> Spring_Web_MVC ?> Spring_Web_Socket	13/03/2022		574
Web	**Spring AOP**	Definition > Provides an aspect-oriented programming implementation	13/03/2022		575
Web	**Spring Instrumentation**	Definition > Provides class instrumentation support and class loader implementations	13/03/2022		576
Web	**Spring Test**	Definition > Supports the testing of Spring components with Junit or TestNG	13/03/2022		577
Web	**Spring Beans**	Definition > Java Objects that are constructed by the Spring Framework > Needs to be configured	13/03/2022		578
Web	**Spring Context**	Definition > Implementation of /Spring_Beans > Supports internationalisation	13/03/2022		579
Web	**Spring Transaction**	Definition > Supports programmatic and declarative transaction management	13/03/2022		580
Web	**Spring JDBC**	Definition > Provides a JDBC abstraction layer	13/03/2022		581
Web	**Spring JMS**	Definition > Contains features for producing and consuming messages	13/03/2022		582
Web	**Spring ORM**	Definition > Provides integration layers	13/03/2022		583
Web	**Spring OXM**	Definition > Provides an abstraction	13/03/2022		584

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Web	**Spring Web Portlet**	Definition > Provides the MVC implementation used in a portlet environment	13/03/2022		585
Web	**Spring Web MVC**	Definition > Contains Spring's Model-View-Controller (MVC) implementation	13/03/2022		586
Web	**Spring Web Socket**	Definition > Provides support for two-way communication	13/03/2022		587
Web	**Dependency Injection**	Definition > Can remove dependency from code > Programming code becomes loosely coupled Types ?> Dependency_Injection_By_Constructor ?> Dependency_Injection_By_Setter	13/03/2022		588
Web	**Dependency Injection By Constructor**	Definition > The <constructor-arg> subelement of <bean> is used for constructor injection	13/03/2022		589
Web	**Dependency Injection By Setter**	Definition > The <property> subelement of <bean> is used for setter injection	13/03/2022		590
Web	**Aspect Oriented Programming**	Definition > Implement cross cutting concerns (log what time you start and end)	13/03/2022		591
Web	**Model View Controller**	Definition > Each request from the ui goes from controller to model > Then model goes to view > View then presents in the ui	13/03/2022		592
Web	**Django Framework**	Topics ?> Django_Process Benefits + Less Time + Fewer lines of code + Object-relational mapper (ORM) + Authentication + Caching	13/03/2022		593
Web	**Django Process**	Types ?> Django_Set_Up ?> Django_Views_Py ?> Django_Urls_Py ?> Django_Models_Py ?> Django_Template	13/03/2022		594
Web	**Django Set Up**	Process > mkdir dir > pipenv install django :- to create environment inside the folder > pipenv shell :- launch subshell in virtual env > django-admin :- check what functionalities you have > django-admin startproject <projectname> . :- starts a new project > python manage.py runserver <portnumber> :- runs server at that port number, default at 8000 > pipenv --venv :- get current venv location (copy), then paste to VSCode View > Command Palette > Python: Select Interpreter, and add /bin/python behind > open terminal in VSCode and press the + to reboot whatever > python manage.py startapp <appname> :- creates new app, and you must put it into INSTALLED_APPS in settings.py > pipenv install <appname> :- installs app as part of the application > source /Users/izzhafeez/.local/share/virtualenvs/singapore-NdF3NIif/bin/activate > deactivate > python -m pip install <package> Properties > manage.py :- works as the django admin, listing the functionalities of django	13/03/2022		595
Web	**Django Views Py**	Definition > Request handler (request → response) Examples <PY from django.shortcuts import render from django.http import HttpResponse def say_hello(request): return HttpResponse("Hello") PY>	13/03/2022		597
Web	**Django Urls Py**	Examples <PY from django.urls import path from . import views urlpatterns = [path("playground/<int:name>/", views.say_hello)] PY> Definition > Can store the urls you want, and map them to the corresponding function Topics ?> Django_Url_Include	13/03/2022		598

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Web	**Django Url Include**	Examples <PY from django.urls import path, include urlpatterns = [path("playground/", include("playground.urls"))] PY> Definition > This is basically saying that all urls of that pattern should be passed to the playground.urls file, chopping off the playground/ bit	13/03/2022		599
Web	**Django Template**	Definition > HTML file where you can pass in arguments Examples <PY {% if name %} Hello {{name}} {% else %} Hello World {% endif %} PY> Topics ?> Django_Render	13/03/2022		600
Web	**Django Render**	Definition > Renders a template Examples <PY from django.shortcuts import render def say_hello(request): return render(request, "hello.html", {"name": "Mosh"}) PY>	13/03/2022		601

Web	**Django Models Py**	Definition
		> Models are their own separate tables
		> https://docs.djangoproject.com/en/4.0/ref/models/fields/#null
		
		Examples <PY
		https://www.youtube.com/watch?v=aHC3uTkT9r8
		from django.utils import timezone
		from django.contrib.auth.models import User
		
		class Post(models.Model):
		  title = models.CharField(max_length=100)
		  content = models.TextField()
		  date_posted = models.DateTimeField(default=timezone.now)
		PY>
			14/03/2022		